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Leadership in Repetitively Innovative Mature Companies

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— Torkel Tallqvist —

Leadership in Repetitively Innovative Mature Companies

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I will bring into daylight the little that I have learnt,
in order for somebody to guess the truth better than myself,
and through his work prove and correct my mistakes.
I will then feel great happiness, in spite of everything,
that I have been the one by which the truth has come into light.

Karl R. Popper

ABSTRACT OF DOCTORAL DISSERTATION AND ACKNOWLEDGEMENTS

With the liberalization of international trade and financial markets, the availability of risk capital in combination with new forces of competition has placed further pressures on established firms to adapt to environmental changes. As the research of Chandy and Tellis (2000) has demonstrated, larger firms are not inferior to smaller firms in their delivery of innovations. Larger and more mature firms—like small firms—certainly have their own set of limitations, but they also have their unique strengths and resources that support the Chandy and Tellis finding. The innovative large/midsize mature firm represents the broad focus of this research, rather than the project, which is usually the centre of innovation research. Innovation is studied as a long–term, sustainable, and persistently led phenomenon, which goes beyond the life span of one project, and in which the role of leadership rather than management is particularly essential. The challenge undertaken in this work is to solve the riddle of how innovation is led in mature firms. The goal of this study is to determine the critical elements that top–level managers attend to in their attempts to sustain the cycle of innovation in their mature firms.

The vital theories of reference are the theory of the firm and those parts of organizational and general management theory that overlap with innovation theory. Interviews were conducted in six medium–sized or large industrial firms. In total, 24 activists of innovation in the firm (interviewees) were chosen within these sampled firms, based on profiles from the theory of promotors of innovation.

The top managers noted three main issues affecting innovation within their firms: motivation or propensity for individuals to take action (what I call a individual motivation–driven factors), internal systemic factors, and external rulers of the firm. Through simple statistical measures, it was possible to distinguish the five issues that received the most attention:

the activists, the product, preconditions of leadership, acts of invention, and decision making. There was also evidence that attention starting from the individual motivation factors moved to the systemic factors, followed by the external rulers. The results of this study provide a critique of the prevalent view of innovation as a process.

The results associated with individual motivation–driven and systemic areas of attention confirm the theories of organic vs. mechanical management systems and theories formal vs. informal organizations. The empirical material demonstrates how they fall short of stressing the environment, however, a message that is clearly articulated by top management. The results also suggest a qualitative aspect of the formal vs. the informal organization. The empirical findings also contribute to the theory of promotors in two ways: by confirming the centrality of the promotors of innovation and by demonstrating the primary and secondary dependencies under which these activists work.

The practical implications of the results of this work create a bouquet of the more specific theories applicable to the research questions in this book. Furthermore, the theoretical part of the work may yield a better understanding of the built–in traits of the organization that serve as barriers to a firm's innovation.

The writing of this book has been a group effort. My greatest debt goes to my 'chief inspirers' Kim Wikström and Magnus Gustafsson for coaching me at Åbo Akademi. PBI served as a base for me, and was an excellent environment to come together with peers. I particularly want to thank Magnus Hellström, Richard Windischhofer, Olga Perminova, Johanna Liinamaa, Thomas Westerholm, and Eva–Lena Nyby–Iljin. The community of doctoral students organized by Hans Georg Gemünden, Karlos Artto, Mia Martinsuo, Krys Markowsky, and Henrikki Tikkanen was a vital place for me to meet with peers and a place of new knowledge creation. Many thanks also go to the skilled and experienced 24 professionals in the six firms in which my interviews were conducted, and who remain anonymous here. I owe a great deal to Nina Colwill and Dennis

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Biskopsgatan 8, March 2009

Torkel Tallqvist

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Leadership in Repetitively Innovative Mature Companies

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PART 1: THE FIELD OF RESEARCH

1.1 Background and Relevance

As the impact of national boundaries decreases, trade across national boarders is increasing, and the pressure upon local economies appears to be toward increased entrepreneurship and innovation. This situation opens new opportunities for firms to expand geographically, thereby resulting, as the CEOs interviewed often mentioned, in 'increased competition and eroding margins'. The competitive advantage derived from a firm's innovation history has started to erode. Thus established companies are under pressure to change, and increasingly communicate their ambitions to become more innovation–driven.

Yet the opportunities are clearly associated with a high probability of failure. It is courageous to state any general failure rate for innovation, as past research (Crawford, 1977) indicates great variations. According to Crawford's literature study, the suggested failure rates of packaged consumer products, including food and drug products, range between 37% and 80%. The failure rate was 80% in 42 out of 88 investigations. In other words, only every fifth new product innovation attempt this study paid off. Thus in spite of the time, effort, and resources expended, people in the organization see mostly failure, which illustrates the risk of involvement, and highlights the courage that an individual needs in order to engage in innovation activity. As Klein and Sorra (1996) have noted, organizational analysts have found that implementation failure is often caused by the inability of an organization to achieve the benefit of the innovations it adopts.

In the long run, there appears to be no strong alternative for sustaining firms but to disregard the opportunities and avoid the risks of invention. As Schumpeter (1942) so strongly stated, the market economy is fueled by new consumer goods, new methods of production

or transportation, new markets, and new forms of industrial organizations. Firms failing to launch successful new products continuously risk losing relevance in the market and becoming overrun by competitors. In describing the role of product development in a firm, Schoonhowen, Eisenheardt, and Lyman (1990), say: 'probably more than acquisition and merger, it is a critical means by which members of organizations diversify, adapt, and reinvent their firms to match the evolving market and technical conditions'

Despite the best efforts of their management teams, *mature organizations* facing such challenges remain frozen and unchanged, and fail to fulfil their ambitions for innovation. The common perception in the field of innovation is that older and large firms would be less able than would small start–up firms to introduce radical innovations. Small, newly founded firms are commonly perceived as the icon of innovations, whereas mature and large firms are associated primarily with incremental innovations. This perception is supported by the theory of disruptive technologies (Bower, Christensen 1995), which states that larger firms will avoid destroying the strengths they have achieved, reducing the attention on new technologies that compete with their existing technology. There is other research evidence suggesting that the conventional wisdom may not be valid, however (Chandy, Tellis, 2000). It appears that it is a question of how the large mature firm deals with the inherent impediments and builds its constellation for innovation, thereby leveraging the undisputed benefits that the large and mature organizations possess. That is why this study examines the whole picture of the firm—unlike many studies in the field of innovation that commonly focus on single projects. From this point of view, it follows that the main attention of this study concentrates on leadership issues, providing the related parts of the organization to work together as a whole—as some kind of system—for running a repetitively innovative mature company. In this book, therefore, innovation is studied as a long–term and persistently led phenomenon, extending beyond the life span of one project.

A mature firm is associated with specific traits, both positive and negative, as the firm ages and increases in size. New product development and innovation projects are rarely the only ongoing business in established firms. There is generally a balance between novelties and ordinary products and services in a company's range of offerings, leading to a leadership challenge to balance business activity between the shortsighted and more controllable operational performance and the farsighted and less controllable R&D activities. Van de Ven (1986) argues that the more successful the organization becomes, the harder it is to push people outside their comfort zone and induce them to attend to new ideas, needs, and opportunities. Research into large mature firms demonstrates the additional complexity of sustaining product innovation (Little, 1990). Entrepreneurs in large and mature organizational environments face a lack of power in connecting innovations to resources, operational processes, and company strategies (Dougherty and Hardy, 1996). The tendency increases in larger companies in which there is conflict associated with the decision–making process, destroying the preconditions for repeated and successful innovation. Organizational politics can consume attention, for instance, and the innovation environment in the company is fragile and sensitive to interruptions.

Dougherty and Hardy summarize their three major findings by labeling the barriers to innovation in mature organizations as 'innovation–to–organization' problems. 1) In successful companies, particular individuals were responsible for the success, using their organizational position to enhance and protect the innovation efforts. The *innovations did not appear to result from an organization–wide commitment*, suggesting that sustainable organized innovations are fragile. 2) Innovators had *limited access* and connections to necessary resources and irregular access to supporting structures and processes, and weak strategic connections across the organization. They claimed that '*innovations had little positive, strategic meaning in the organizations*'. 3) They concluded that *innovators enjoyed very little, temporary, or no support at all from senior management*. Matters like

mergers, performance pressures, cost cutting, or downsizing appeared to supersede innovations on the agenda of senior management. Innovations appeared as a one–time event of concern only to upper management.

The change from entrepreneurial to post–entrepreneurial organizations demonstrates the difference in leadership environment, which, I argue, calls for another type of leadership in mature innovative firms. By definition, an entrepreneur is 'someone who perceives an opportunity and creates an organization to pursue it' (Bygrave, Hofer, 1991), and someone who is 'pursuing opportunities without regard to the resources they currently control' (Stevenson, Jarillo, 1990). The success of the entrepreneur accumulates, at best, dramatic business growth and increases in employment. Successful entrepreneurs grow with the challenge, simultaneously mobilizing a winning organization and utilizing technological development. A successful entrepreneurial business eventually encounters a major concern: arranging the succession. Because a similarly minded, experienced, trained, and networked individual cannot be hired, the leadership constellation is bound to change. When the *start up firm* has successfully grown large, it has become an integral reflection or extension of the entrepreneurial founder's role in the organization (Madique, 1980). A major cultural discontinuity occurs in the phase shift from a firm led by a founder–entrepreneur to one led by a hired manager. Aaltio–Marjosola (1991) describes a culture change that occurred in their study when an entrepreneurial firm was turned over to a successor. The entrepreneurial stage was characterized by stable networks, implicit norms, stable structure, low personnel turnover, high commitment, a sense of 'being special', pride in uniqueness, growth, heroism, a sense of rebellion, organized secrets, high–quality products, and shared feelings of success. A new culture, established under the successor, was characterized by formal rules, liable structure, high turnover of personnel, low commitment, a sense of being ordinary, shame due to past 'sins', lack of growth, no signs of heroism, a sense of conformity, few organizational secrets, no new products, a shared feeling of loss, and a breakdown of networks. This

contrast suggests that pure entrepreneurial leadership transplanted into a mature organization will probably be neither sensible nor successful. This book tells the story of what replaced the entrepreneur's leadership system—a system that makes a mid–size and mature firm as inherently successful as it was under the leadership of a successful entrepreneur.

Dougherty and Hardy (1996) claim that sustained innovation can occur in a large organization when project–level problems are resolved across multiple innovations and multiple stages simultaneously. Taking a different angle, Van de Ven (1986) proposes four key leadership questions in the management of innovation: 1) How does the organization develop good ideas into good currency, eventually making money from ideas? 2) What leads people to pay attention to new ideas, keeping in mind that there are several 'more important' matters deserving their attention? 3) What happens when part–whole relationship difficulties emerge? 4) How is leadership institutionalized to become the permanent foundation for repetitive success? According to Van de Ven (1986), the leadership challenge related to innovation is to manage human attention, manage the process into the commercial stage, maintain the proper perspective of the structural relationships and identity of the innovation project, and lead the strategic identity and institutional dynamics affected by the innovation project. Similarly, Dougherty (1992) has studied interpretive barriers to successful innovation in large firms and pinpoints the role of organizational product routines and 'departmental thought worlds'. This empirical study examines the perceptions of upper managers as they manage the innovative firm.

Another challenge of leading innovations stems from the long–term nature of sustainable innovation, which, as Schon (1971) argues, is not constant over time. Schon's model describes the leadership challenges faced during the stage when ideas develop from the pre–stage of inventions into innovations. In this proposal, everything centers on the idea, around which collective action is mobilized to refine the idea into a success. The cycle, which begins with a disruptive event that precipitates a controversial

solution, ends when it is taken for granted (see Figure 1).

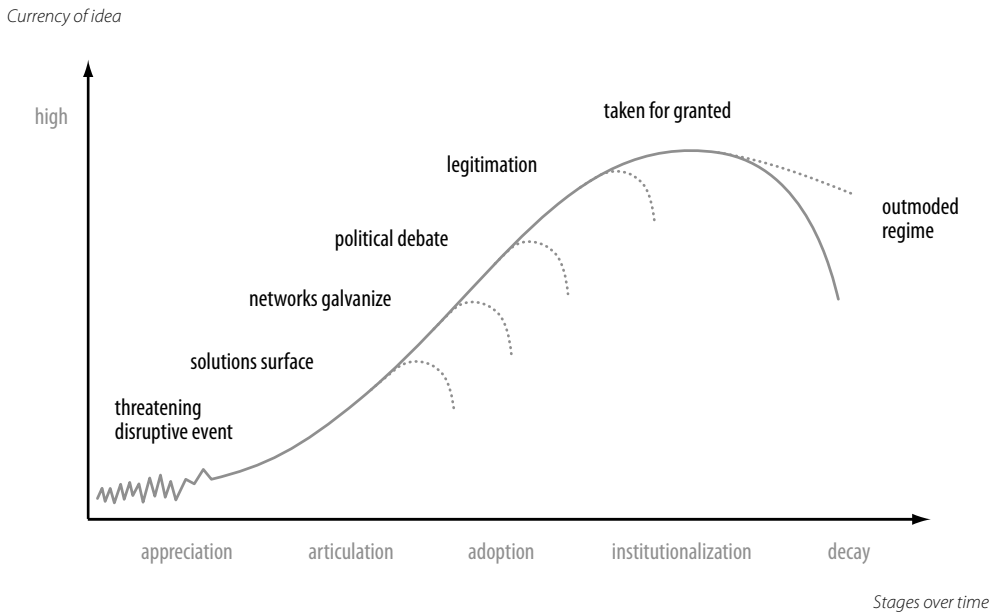

Figure 1. Managing Life Cycle of Ideas
(Source: Schon, 1971).

Figure 1 illustrates different phases when different frames of reference are useful contributions in the process. Schon's model has focused primarily on socio–political context, describing emerging public policies. Quinn (1980) applied analogous descriptions for the development of corporate strategies. The model emphasizes the need for awareness about the different types of leadership required in different stages of the innovation process. Leifer et al. (2000) arrived at a similar conclusion by identifying nine phases of the innovation cycle in large mature firms, from which were drawn the corresponding competencies required to address the challenge. In the Leifer et al. study, the phases of managerial challenge were to capture the ideas in the fuzzy front end, managing radical innovation projects, learning about markets for the innovation, resolving uncertainty in the business model,

bridging resource and competence gaps, making the transition from radical innovation projects to operating status, and finally engaging the individual initiative. Leifer et al. further arrived at a proposal listing (p.18, 2000) six general characteristics of the innovation life cycle.

- It is long term, commonly lasting ten years or more.
- It is highly uncertain and unpredictable.
- It is sporadic: it has stops, starts, deaths, and revivals.
- It is nonlinear, requiring a recycling back through activities in response to discontinuities and setbacks.
- It is stochastic; players come and go, priorities change, exogenous events are critical.
- It is context dependent; history, experience, corporate culture, personalities, and informal relations all matter.

In contrast to the Schon (1971) and Leifer et al. (2000) proposals of the central problems and changing challenges along the cycle of an innovation, the empirical study described in this book was initiated in order to examine the sustainable qualities of leadership along the cycle of innovation.

Earlier research related to the field of innovation in mature and large firms is commonly found under the topic 'senior management support'. The vital role played by senior management in the success of an innovation has been well documented (Ernst, 2002). One common approach to this research is to describe the field of innovation through success factors, where the leadership issue is one among many issues. Moreover, the innovation project has generally constituted the entire scope of research. Most of the research found in this field is investigated using quantitative methods; qualitative studies are not equally common..

Brown and Eisenhardt (1995) did an extensive literature research and made a map of success factors of new product development primarily

centred on project level. One of several conclusions of that research was: 'Our understanding of how senior management affect development is incomplete. The management–related concepts such as vision, subtle control, and even support are vague. There is also little understanding of the links between product effectiveness and the creative processes by which senior managers and others match firm competencies with market needs to create an effective product concept'. Senior management in this study was one success factor among many, yet it constituted one of the main conclusions of the study.

Cooper and Kleinschmidt (1995) performed a *company–level analysis* focusing on the success factors driving new product performance in 135 industrial manufacturing companies. The aim of the study was to investigate causes of the differences between the 'solid performers' of innovation the other companies observed in this study called 'dogs'. The result of the analysis suggests that the main performance drivers that make the solid performers different are, in rank order, 'a high–quality new product process; a clear, well–communicated new product strategy for the company; adequate resources for new products; senior management commitment to new products; an entrepreneurial climate for product innovation; senior management accountability; strategic focus and synergy (i.e., new products close to the firm's existing markets and leveraging existing technologies); high–quality development teams; and cross–functional teams' (p.374, Cooper, Kleinschmidt, 1995). Cooper and Kleinschmidt (1995) further concluded that the senior management of solid performers of innovation were strongly committed to new products, were intimately engaged in go or no–go spending decisions, and devoted necessary resources to new product development. Furthermore, specific measures formed part of their annual objectives and served as criteria for compensation, which was tracked regularly. The track record was based on sufficient funding and budgets of ventures and on personnel resources that were freed for that purpose. Ernst's (2002) study, building further on Cooper and Kleinschmidt's research (1995), positions senior management

among other categories of past research of NPD success factors. In this study, the success factors found in earlier research are categorized into the NPD process, including customer integration, the organization, the culture, strategy, and the role and commitment of senior management.

Prattikawa et al. (2005) undertook a survey of success factors, and their conclusion was based on the performance of new product projects. They analyzed the literature in an attempt to pinpoint 'the strength and stability of predictor–performance relationships' (Prattikawa, Verwaal, Commandeur p.1178, 2005). Their meta–analysis identifies 22 variables that have a significant relationship with new product performance, categorized as four general fields of environment, strategy, organization, and process. Leadership and inter–functional coordination, subordinated to the category of organization, revealed a sizable predictor–performance relationship, particularly in terms of degree of organizational interaction and R&D/marketing integration. Top management support, communication and information, and organizational climate/culture had a smaller yet significant relationship to product project performance.

In an alternative stream of literature, innovation leadership is approached from an organizational and resource–based point of view. To mention one project that is close to this study, Salomo, Gemünden, Leifer's (2007) investigated dynamic capabilities of corporate innovation systems. They suggest that a corporate mindset oriented toward innovation, in combination with consistent innovation activities supported by a governance structure favourable for innovation allows an organization to make full use of its potential for innovation. Their study was based on a literature review, contrary to this study, which looks for similar knowledge through case studies addressing the senior activists of innovation.

Another alternative of the resource–based research stream focuses on the key individuals and the division of labour in innovation management (Hauschildt, Chakrabarti, 1988)—a stream of research that focuses on the centrality of the individual as innovation takes place (Hauschildt,

Kirchmann, 2001). In North American literature the attention is usually focused on one person: the champion of innovation. The German research tradition, on the other hand, builds on the assumption of a coalition of a particular type of activists—the promotors of innovation. The positive impact of the dynamic roles of the promotors to overcome barriers of innovation, and the improved tendency of the organization to deliver innovation is well documented. The starting point of this study was finding the promotors of innovation in each case firm and relying on the evidence provided by these persons. This book is about their stories.

The Gomez et al. (2001) study of senior management support examined, among other things, the relationship between senior management support and project performance and the means project managers and team members of the innovation process perceived as the means used by senior managers. It appears from this study that there are direct means, like steering committees, multifunctional senior teams, joint leadership, process champions and direct channels of communication; indirect means of influence, like mission, goals, company strategy, and structural solutions on the organizational level; and, at the process level, such means as staffing, brainstorming, customer contact, internal promotion, and learning systems. The difference between the Gomez et al. study and this study lies in the nature of the informant. Gomez et al. relied upon 'actor's views and feelings with regard to senior management support' (pp.236, Gomez et al., 2001), whereas the informants in this study are senior managers themselves.

In a study of 213 R&D projects in 21 companies, Green (1995) found a significant relationship between the perception of persons being supported and project performance. Support was given to major projects that originated not from the R&D department, but from business goals like big investments, new products, and incremental improvements. Although projects undertaken with the blessing of senior management were less likely to be terminated, 'completed projects with top management support were not judged to make greater contributions to the

firm's business goals'. According to Green (p.223, 1995), top management may not always be able to pick winners.

1.2 The Research Problem

Opening the black box with the 'life of innovations' in mature firms may be further illustrated by some descriptions of empirical references from those who are engaged in innovation activity.

> To bring the discussion about innovation truly down to earth, when we think of ordinary company leadership you have to secure a big number of *other resources too*. If we, for instance, plan a new product, surprisingly it takes millions of euros to invest, surprisingly it asks for people, production facilities, and layout changes. All of this [in combination with the existing] has to be seen as facts of life in the discussion about innovation [*CEO*].

This quotation from my interview data underlines the challenge of mastering the innovation act, in conjunction with the ongoing show of the day–to–day business. From the embryo of an idea to the enduring commercial success, the process of innovation takes a hazardous path. Disregarding firm size, the probability of innovation failure is far greater than the probability of success. Beyond that, the role of new product development in large and mature organizations is embedded among other internal, conflicting priorities in senior management's agenda. Senior management must be in control, delivering shareholder value, yet innovation seems to be a field absent of regulations. This study examines the area that lies in between these two extremes, allowing a firm to operate in an organized way. To quote an chief designer:

> Company leadership likes order in general and to be in control; they like to know where their players are and to be

> in a position to trust that nobody will create a surprise. A given proportion of disobedience is uncomfortable for them. Although leaders may firmly advocate that they want creativity and new things, deep down, order is what they seek. Thus creativity commonly becomes subordinated to order.

The commonplace way of trying to introduce order is by advocating a 'process' to ensure that there is discipline in developing and delivering new things. Various stage–gate models are introduced, partly to maintain control, and partly to ensure that the players are talking about the same things when addressing the activities of innovations (see Figure 2).

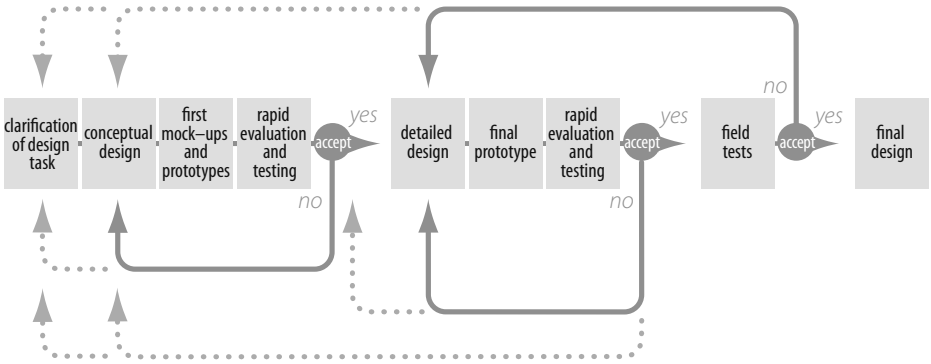

Figure 2. Innovation Process Scheme
(Source: Gardener Company brochure).

One may wonder 'What is left to research?' The consultants have drawn the roadmap for innovation to proceed—a map containing the flow chart, the milestones, the task, the feedback loops, and related items. The gap is commonly expressed in the subordinate clause: 'This is, of course, in reality, not exactly how it is goes'. The starting point in this work is not to take for granted the macro statement that 'culture' is the answer, at least not the only answer. The aspiration is to find the significant and particular

that matters, which is not in the picture of today. As one designer expressed it, 'I don't know what we have to say; we have had a *pragmatic approach*. I cannot describe the process with a diagram' (see Figure 1) or as the managing director said 'Well, it is like a system which, in a way, does not exist, and still it is there'. This study aims to increase our knowledge about that controversy.

Some of the managers seem to master this hardship, however, taking the burning candle through the wind, time and time again. What is the meaning and the point of the 'pragmatic approach' in firms that are capable of dealing with the phenomenon of being repetitively innovative?

1.3 The Purpose and the Questions of the Research

To summarize the path to the purpose, as described in Sections 1.1. and 1.2., this study is positioned as a qualitative study of the industrial consumer product sector. The view observes that innovation is integral to mature midsize firms. Furthermore, the scope is not on a project but in leading the long–term subsequent cycles of innovation. The attention is on the dynamic and sustaining structure, which has replaced the past system of the entrepreneur leading the firm. The key issue in this study is finding empirical evidence of the centre of attention, or the 'thought world' (Dougherty, 1992) of the leaders, within this chosen scope.

In this research is observed mid–sized mature firms that demonstrate an ability to and sustain innovation. Mid–sized firms are referred to here as firms with average gross revenues of €200 million. Innovative refers primarily to product–oriented innovations, successfully launched in the market, being both new to the firm and new to the market (further terminology definitions are provided in Section 1.6). The innovation discourse is studied particularly from the angle of *leadership of innovative firms*. The research questions are:

How is innovation led in mature consumer–product firms?

- Which areas of attention helps to maintain a state of innovativeness and the cycle of innovation?
- What are the dependencies and the dynamic between these areas of attention?
- How can the leadership system/mindset in an innovative mature firm be characterized?
- What is the difference in leadership between innovative and non–innovative firms?

1.4 The Scope and Limitations

The focus in my study is on product innovation, yet innovations are not merely limited to the physical product. A further focus of the research is on cases of innovation that have reached a stage of maturity in which they are generating significant cash flow.

The companies examined in this research are mature, autonomous, mid–sized firms in the branded consumer goods sector, producing products and related services. All the firms comprising the empirical sample aim to professionalize their innovation and have chosen product renewal as their primary long–term business growth driver. This research concentrates on firms that are beyond the founder–entrepreneur phase—firms in which professional management is already established.

Vital fields of knowledge that border on this research is the area of entrepreneurship. The quality of the empirical cases in this area, however, prevents inclusion of entrepreneurship in this book. In only one case was the transition from the entrepreneurial to the post–entrepreneurial system of leadership clearly visible. In two other cases, references were made to the entrepreneurial phase, but these were only peripheral remarks.

The topic of corporate entrepreneurship also borders on this area of study. Corporate entrepreneurship is regarded in the literature primarily as internal innovation and venturing, but also as strategic renewal of the

key ideas which reshapes a business. (Guth, Ginsberg, 1990). Corporate entrepreneurship is not a particular focus of this study, as the activists interviewed did not introduce this perspective.

1.5 Structure and Flow of the Thesis

The flow of the thesis is illustrated in Figure 3.

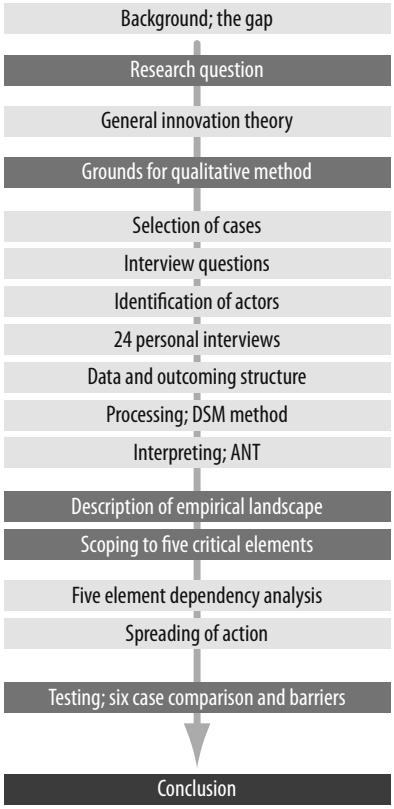

Figure 3. Flow of the Report.

1.6 Terminology

Different interpretations of the word *innovation* lead to different assumptions, discussions, and conclusions. In this research, innovation is understood to be something *new to the market and new to the firm, being a commercially successful product invention*. That is, a 'new to the world' product is not required. Even if the idea has been launched to the users and publicly recognized, it still is not regarded as an innovation until it becomes a financial success. Based on their literature review, Garcia and Galatone (2002) have established a comprehensive table of the large spectrum of uses of the term 'innovation' (see Appendix A).

In this book, *product innovation* is seen in a sense that is wider than that of a mere physical product: it can also be a product–related service; it can occur as a part of the value chain from order–to–delivery to use–to scrap; or it can be new raw materials, new methods for manufacturing, or new forms of industrial organization.

It cannot be ignored that opportunities are idiosyncratic (Shane 2003); therefore, it appears as if a track record of *repetitive innovation* would be beyond the control of senior management. Nevertheless, there is evidence in the empirical cases that the coincidental nature of innovations is not impossible to challenge. The likelihood of innovations occurring in an organization increase as the observational time span is extended. Also by relaxing the definition from 'product innovation' to cover product–related innovations, it increase the probability of finding serial innovation in various forms. A limitation of the quality of the innovation is still within the definition for an innovation applied in this research: *a competitively successful product that is new to the firm and new to the market*.

Leadership and management are regarded as separate terms in this book. The terms are overlapping; management is understood to be control and organization of something and leadership as a person or group of persons who lead others, emphasizing the leader's set of ways to make others follow (see Figure 4).

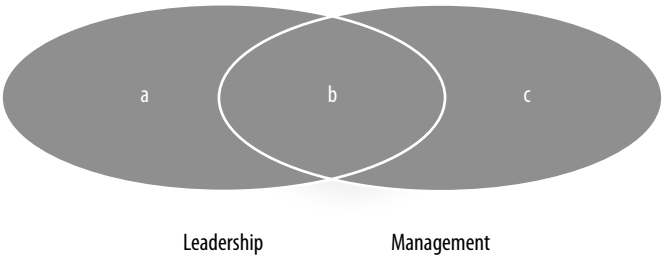

Figure 4. Overlap of 'Management' and 'Leadership'.

Whereas management is predominantly seen as doings and tasks, leadership in this research is primarily understood to be influencing others to do the management. In this respect, leadership deals broadly with shaping the unknown, to designing a reasonable vision for collective and manageable action. A pure example of management is doing the day–to–day planning work, whereas leadership is encouraging people to engage themselves in the planning.

PART 2: THEORIES OF LEADING MATURE INNOVATIVE FIRMS

The main criterion for the selected literature review is, having done the study, the central area of attention found in the analysis of the empirical observations in this study. The research questions were the leading idea for the initial selection of literature. The literature review in this book begins by familiarizing the reader with the phenomenon of innovation. The review, as well as the observations in the empirical material, addresses general conceptions of the firm environment, which determine the purpose of the firm. More specifically, the attention here is on the situation, the mission, and the strategy—the firm's business model. A fundamental starting point is the idea that 'an organization comes into being when there are persons able to communicate, who are willing to contribute action to *accomplish a common purpose*' (Bernard, p.84, 1938). Innovation in this book is regarded as being a vital part of the common purpose of the firm. 'The test of organizational cooperation effectiveness is the *accomplishment* of a common purpose or purposes' (Bernard, p.60, 1938). The organization structure follows as a consequence of and a synthesis from these general conceptions of the firm's environment and the purpose of the firm. As vital elements of the organization structure are highlighted, the *administrative principles* like specialization, line of command, span of control; *generic goals* of the firm; and the *decision making process* in terms of information processing and bargaining, knowledge creation, procedures of choice, and the very decision. Up to this point, the literature review has primarily presented the firm's organization as an impersonal bureaucracy in which the structure rules individuals, who are characters in a formal organization (Cyert, March, 1963). Assuming that the individuals have both an organizational and an individual motive (Bernard, 1938), unanticipated responses of the organization members (March, Simon, 1953) come into the picture. Hence, vital new pieces of information related to the knowledge of organization behavior become relevant. Aspects like

the values, company culture, identification, authority, and willingness to contribute are seen as new dimensions of the organization. These elements are vital parts of the informal organization, which are contrary to the formal 'acts without a specific joint common purpose'. The action oriented informal organization relies on certain commonly held attitudes. (Bernard, p.114, 1938). From this, it follows that the firm is seen not merely as a machine that is possible to program and control. The literature review thus far has set the stage with models describing organizational structures and behavior, and the review has now come to the point at which the managerial perspective of the same organization is highlighted. Attention is drawn to recognizing the characteristics of formal vs. informal organizations and mechanical vs. organic systems of management, which enable the leaders to deal with the structures and behaviors in a dynamic way. In the end of the review a common misconception is challenged, that all individuals in the organization are equally essential in the acts of innovation. At the end of Part 2: Theories, attention is concentrated on particular characters and profiles of the people at the top, *activists*, champions, entrepreneurs, and promoters, and a suggestion of how they bring about innovations.

Fundamental theories are, among others, theories of innovation by Schumpeter, Kirzner, Utterback et al.; the behavioral theory of the firm by Cyert and March (1963); the organizational theory of March and Simon (1953); the theory of administrative behavior by Simon (1945), the theory of strategy by Porter (1985); the theory of innovation management by Burns & Stalker (1963); the theory of the executive function of (1938); the theory of promoters of innovation by Hauschildt and Chakarabarti (1988); and the theory of organizational new knowledge creation Nonaka and Takeuchi (1995). Earlier research specifically connected to the research question was addressed in Part 1: Field of Research.

After reading the theoretical part of this book, the reader will have an overview of the latent and general traits of the organization, which are also present when dealing with innovations in mature firms. The presentation

of the general view is needed, as innovation is found to be not an isolated phenomenon in managing the firm, but an integrated phenomenon among all other everyday activities. Innovation leadership is regarded as a balance between the ordinary day–to–day general management mode and the innovation management mode. The selected theories are needed later in the Part 4: Analysis, which presents an explanation for why innovation happens and *does not* happen, as a function of the nature of the firm. Like what has been discovered to be the leader's focus area, the selected theories are also assumed to be the firm's overriding contingencies for successful innovation. As several conceptual views are crafted into one text, there is an element of my interpretation of the parts that go together and an inevitable overlap of different views. At a general level, the theoretical references belong to the domains of organization, strategy, and management theory, illustrated in Figure 5.

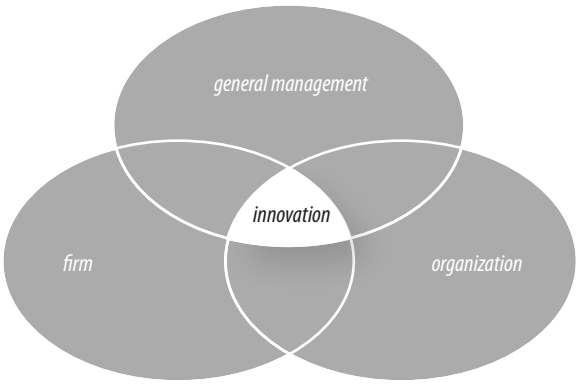

Figure 5. Frame of Theoretical References.

2.1 Highlight of the Phenomenon of Innovation

This section serves to familiarize the reader with the phenomenon of innovation on a general level. The flow of topics begins with the origin of the idea and the commercial effects of innovations. The focus then moves to the types of innovations associated with business management and the process of innovation for implementing initiatives in an industrial firm.

2.1.1 The Rise of Opportunity

History usually looks ordered, whereas the present seems blur and the future uncertain, and history well describes the context of opportunity recognition. From the discourse of entrepreneurship theory, a few guidelines can be distinguished to challenge the ambiguous conditions. In the following section, the opportunity is regarded from the perspectives of *the general character of opportunities; the sources of new opportunities;* and, finally, *forms of new opportunities*.

Schumpeterian versus Kirznerian is one of if not *the* most referenced general explanation of the existence and emerging of new opportunities. Kirzner's (1973) fundamental claim is that opportunity lies in the differing levels of *access to existing information*—some have access and some do not. Schumpeter's (1942) claim is that *new information* is central to an explanation for the existence of entrepreneurial opportunities. In other words, a Kirznerian approach *explores* an idea within an established paradigm or business, whereas the Schumpeterian approach assumes the *creation* of true novelty, which, according to Norman (2001) requires 'frame breaking' thinking. It can be expected, therefore, that the Schumpeterian view leads to more radical innovations, more extraordinary and order–breaking ideas than does the Kirznerian view. The Schumpeterian perspective involves greater risks than the Kirznerian perspective. These two views are not mutually exclusive; rather, they distinguish different types of opportunities that can be prevalent in the market at the same time

(Shane and Venkataraman 2000).

The sources of opportunity recognition add an additional angle to the opportunities to understand and perceive. On a general level, Shane argues that different industries have varying potentials for new entrepreneurial opportunities, and at some point, some industries are more fertile than others. Kirznerian opportunities, Shane argues, are derived from errors or omission of prior decision makers that create the opportunity to exploit market shortages. Furthermore, these shortcomings are idiosyncratic in nature; they can occur randomly anywhere and any place where actors make mistakes.

The Schumpeterian perspective is associated with a different type and set of leads to the locus of opportunity. This direction encourages a look at *technological discontinuances* and *social, demographical, political,* and *regulatory changes*. All these changes have a characteristic in common: they all cause an increase or decrease in the value of available resources, which implies price instability of the resources and entrepreneurial opportunities (Shane, 2003). In the 1960s and 1970s, for example, female entry into the labor market constituted a large movement that was a socio–demographic source of change. Consequently, there emerged a significant new need for prepared food, which became an opportunity for those actors who recognized the possibility of recombining resources, buying raw materials, and producing prepared food for sale to those busy new consumers.

The form of opportunity is an additional way of tracing opportunities. In general, opportunities are expressed in terms of inventing new *products* or *services*. Another form of opportunities emerges in response to alterations in parts of the value chain. In addition to the forms defined as products and services, there is an extended Schumpeterian typology for forms of opportunities: new geographical markets, new raw materials, new methods for manufacturing, and new ways of organizing. Norman (2001) argues for a slightly different typology, expressing different characteristics in terms of *industrial*, *customer–based,* and *reconfiguration of value–creating* systems.

2.1.2 Evolution and Sales Take–off of Innovations

Agarwal and Bayus (2002) have studied product innovations over some 150 years, covering innovations that are in current use. Some 30 major product innovations were surveyed, including the sewing machine (invented 1830, sales took off 1859), the automobile (1771, 1939), the phonograph record (1877, 1919), the vacuum cleaner (1907, 1934), the dishwasher (1898, 1955), the radio (1912,1923), the electric razor (1928, 1943), the turbojet engine (1934, 1951), the ballpoint pen (1888, 1958), the magnetic recording tape (1928, 1968), the heat pump (1851, 1976), the computer printer (1944, 1979), the home microwave oven (1947, 1976), the monitor (1927,1981), the micro computer (1962, 1982), the home VCR (1951, 1980), the CD player (1979, 1985), and the cellular phone (1970, 1986). The study observed product innovations from four different points on the time axis. The first reference point occurred when the product idea was initially recorded and the second when the product was made available commercially. The second set of reference points occurred when the number of firms started to increase around the product idea, and the last was when popularization reached a point where the firm's total sales started to grow radically.

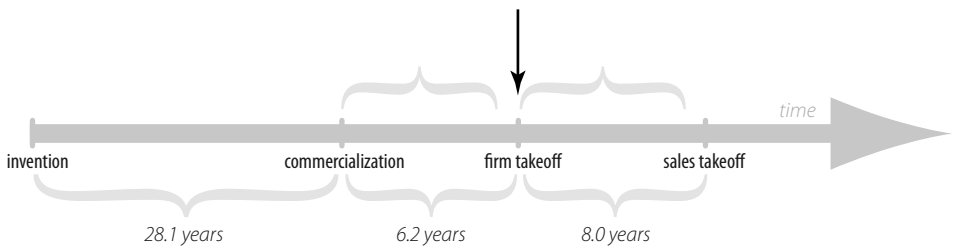

Figure 6. Lead Times from Invention to Sales Takeoff (Source: Agarwal and Bayus, 2002).

The study reveals an interesting pattern of phases, as illustrated in Figure 6: the time from invention to commercialization, from commercialization to firm takeoff, and from firm takeoff to sales takeoff. From the firm perspective, it is relevant to note the proposed time duration of each phase; the phase from idea to commercialization is a matter not of years but several and even tens of years. If this information is combined with the theory of the firm, in which the annual budget is one of the main 'standard operating rules' of the firm (Cyert, March, 1963), it highlights and leads to one of the key areas in which the fundamental traits of the firm do not go hand in hand with innovation.

If the results of the study are examined further, it raises three points about market behavior and the environment of the innovative firm: the period from the first commercial product until the market started to grow rapidly was 14 years, the market sales takeoff is preceded by an increase of actors in the market, and the number of firms around the same base idea starts to grow some 8 years prior to sales taking off in the market.

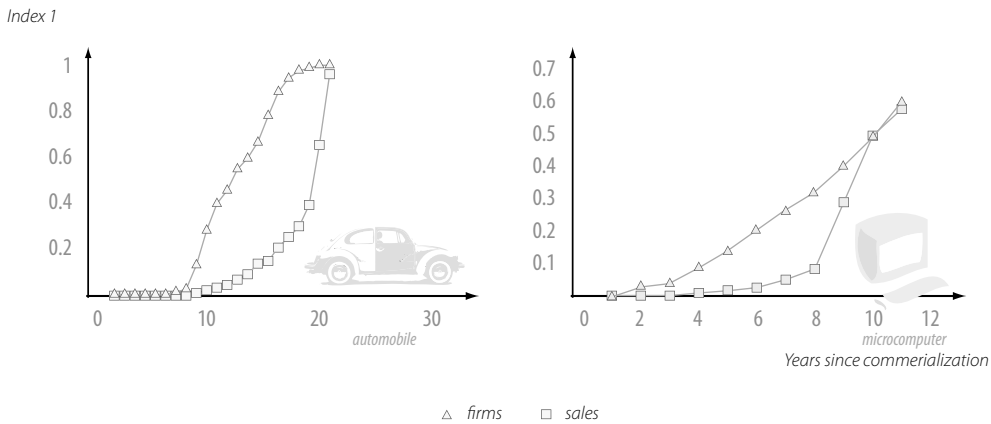

Figure 7. The Evolution of Market Structure For Product Innovations (Source: Agarwal and Bayus, 2002).

Agarwal and Bayus further observed specific cases before and after World War II, and proposed that a comparison between the evolution of the automobile and the evolution of the microcomputer should indicate time changes in the product life cycle from innovation to sales takeoff (see Figure 7.). As also shown in Figure 8, the duration of the phases has generally shortened with the effect of the lead time of commercialization, time of market entries, and time of sales takeoff. The study did demonstrate, however, that lead time for innovation had been reduced between the wars.

Figure 8. Years of Lead Times of 30 Major US Innovations During Past 150 Years (Source: adaptation of Agarwal and Bayus, 2002).

Agarwal and Bayus (2002) concluded that both the sales and the number of first commercial products in the cases they studied demonstrated slow growth, whereas the growth in number of firms systematically comes before the growth of sales, followed by a sharp takeoff in sales. This finding led to the conclusion that a firm's decision to enter a new market early is triggered, not by actual sales, but by expectations of upcoming sales in the industry. The new entrant's impact on increased demand and diversity, it was also argued, legitimated an innovation, and the combined effects appear to have a positive effect, largely explaining the takeoff of sales.

2.1.3 Dominant Designs and Product vs. Process Innovations

The theory assumes that offerings in the market go from a large variety of products to a dominant design, followed by incremental innovation on standardized products. 'A dominant design is a specific path, along an industry's design hierarchy, which establishes dominance among competing design paths' (Utterback, Suarez, 1993). The technical uniqueness is not necessarily a predictor of an emerging dominant design, because, as they argue, there may be numerous other classes of user requirements. There are classes of demands other than the technological, which may be combinations of technological, economic, and organizational aspects making up the dominant design in an industry. The early evolution of an emerging new category of various kinds of proposals and paths is illustrated in Figure 9.

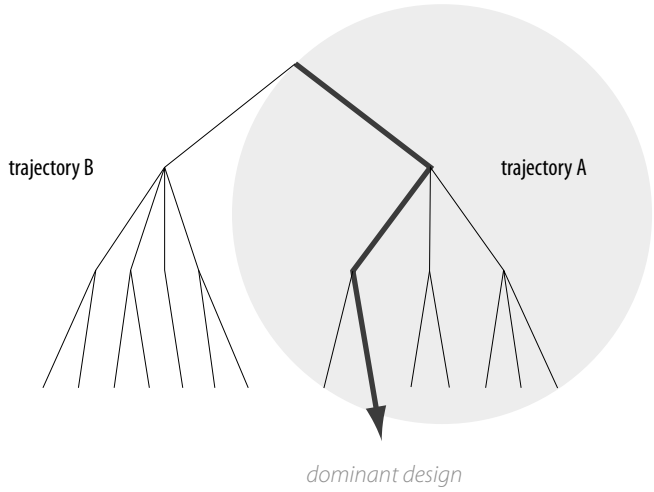

Figure 9. Design Hierarchies and Dominant Design (Source: Suarez and Utterback, 1995).

The paths, labeled trajectory in Figure 9, mirror the market evolving from an indistinct and fragmented market with quick response, toward

a commodity–like market with standard products. There is an assumed time reference for when a dominant design takes effect in a competitive market. Building on the earlier proposal that the number of new entrants in an emerging market forecasts the sales takeoff in an industry, the dominant design, I would argue, is associated with the evolution of the number of firms active in the market. In the former case, however, the number of firms is probably the cause; whereas, in the latter case, it is the effect. Suarez and Utterback's research on such historical innovations as the typewriter, car, television, and calculator is used as the grounds for evidence (see Figure 10).

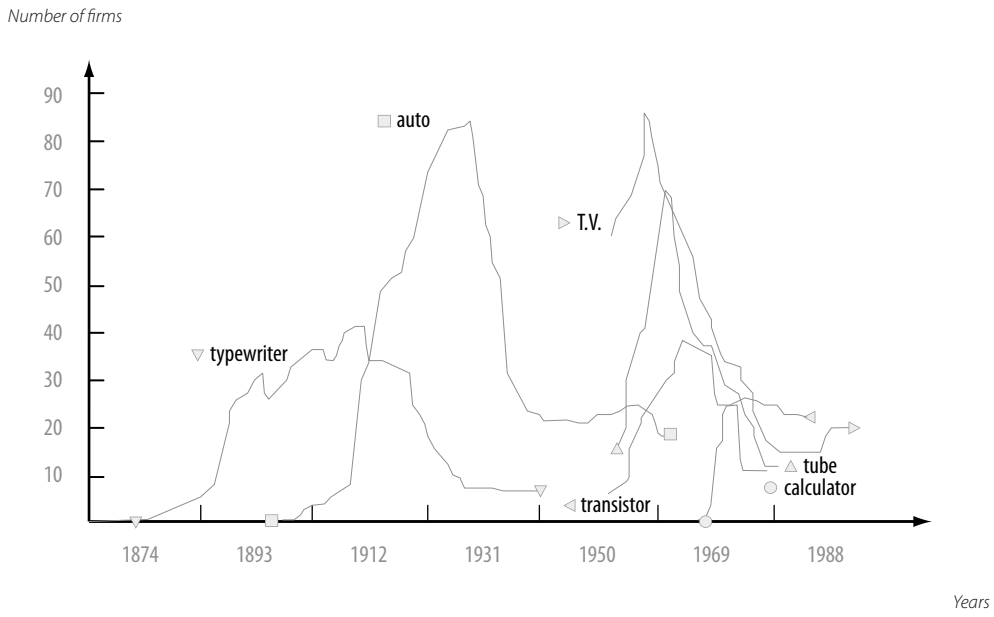

Figure 10. Number of Firms Participating in Six Industries in the USA 1874–1988 (Source: Suarez and Utterback, 1995).

The argument is that as an effect of the dominant design, some player or players in the market who master the dominant design raises barriers to entry. Thus the dominant design is a milestone to market entry. The time

before this milestone has the characteristics of industry experimentation; the time after the milestone has the characteristics of a fight for strengthening the position. Clearly the first innovative firm is by no means self evidently the one introducing the dominant design.

Corresponding to this phenomenon from the viewpoint of market competition, the development goes from small firms with unique products toward an oligopoly of firms with high similarity in their offerings. The implication for manufacturing processes is the shift from vital reliance on skilled labor and general–purpose equipment to specialized equipment used by low–skilled labor. The corresponding organizational mode goes from entrepreneurial to hierarchical. In a later subsection (Organization Characters and Management Structures), this phenomenon is referred to as a transition from organic to mechanistic systems of management. The arrival of a dominant design opens new opportunities for standardization, which is the beginning of the path of rationalization with the subsequent opportunities for economy of scale in producing the product. Consequently, there are waves of innovations in which the product innovation waves are followed by process innovation waves (see Figure 11).

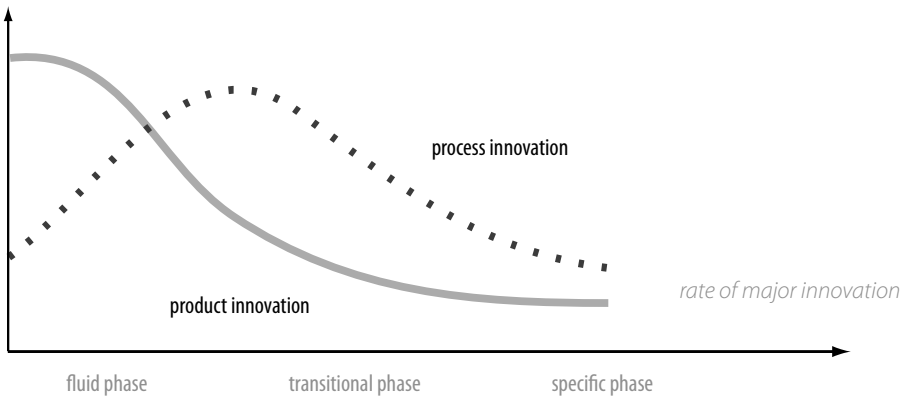

Figure 11. Dynamics and Waves of Innovation (Source: adaptation of Utterback, 1941).

In the theory of dominant designs (Utterback, 1941), the relationship between product innovation and process innovation varies over time for assembled products. Phases in an industry or an individual firm can range from the indistinct (fluid phase), with an absence of forms and structures, to the more formal (specific phase). Utterback claims that product innovations come before process innovations, both of which are associated with the same three phases. The inflexion point, when the first innovation is succeeded by another wave of innovations, is when a product innovation gains a market position of a dominant design.

2.1.4 Types of Innovations

Although product and product–related innovations are of prime concern in this study, a short detour follows into a further applicable typology of innovations. Figure 12 presents a view of types of innovations more oriented toward the deliverables of a firm, with existing fundamental organization structures as given and primarily unchanged. Another level of innovation could be described in terms of the business model, where the starting point is not the existing structures but is oriented more toward the purpose of the firm. The business model is further elaborated upon in a later subsection Strategy.

Figure 12. Kinds of Innovations
(Source: lecture material of Gemünden H.G., 2006).

Figure 12 presents aspects of the innovation as an object and as a way of making it, and views the innovation from the parts that constitute it. The innovation can also be seen from the viewpoint of cooperation, interaction, and affiliation among participants internally—but also externally, in cases in which the firm becomes an integral part of its environment. Finally, the unpenetrated markets may be the distinct area of imagination and creativity.

2.1.5 Process of Innovation

It is taken for granted that the ideal way of dealing with innovations ranges somewhere between chaos and some level of an articulated process. Research by Cunha and Gomez (2003) concludes that companies with no formal process in place are less likely to be successful in implementing innovations, as compared with those companies with some type of formal process in place.

There are two basic variations of the process of product innovation (see Figure 13). One is the traditional technology–driven sequential model, by which new ideas are generated in the R&D department; sent to engineering and manufacturing, where the intended product is produced; and then sent to marketing for sales and distribution to customers. In an alternative model, the design is driven by customer need; marketing generates new ideas as a result of interactions with customers; these ideas are sent to R&D for prototype development and from there to engineering and manufacturing for production (Van de Ven, 1986).

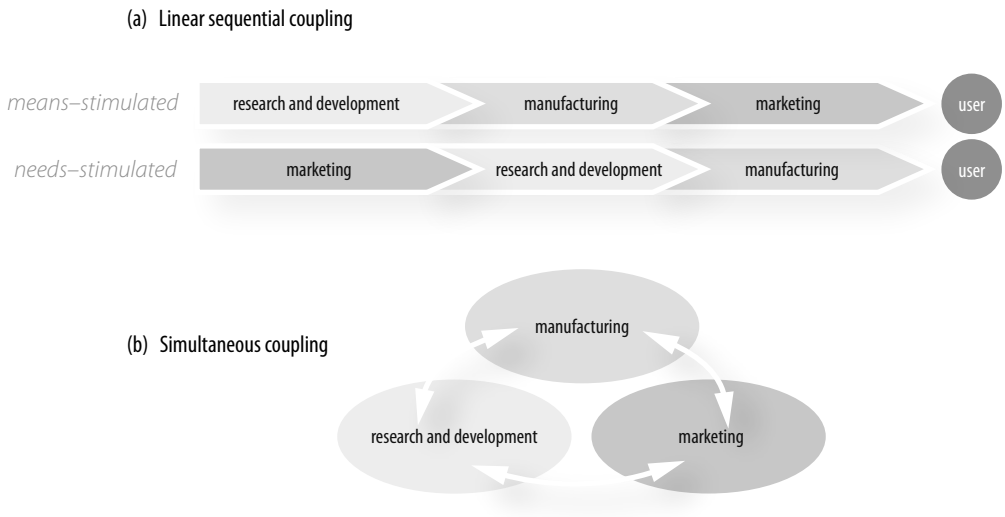

Figure 13. Linear Sequential Coupling Compared With Simultaneous Coupling of Knowledge (Source: Galbraith, 1982).

As Galbraith (1982) points out, it is debatable if innovations are stimulated by technology or by customer need. In his view, the innovation process comprises inseparable, united functions during an ongoing transition process. For innovation to occur, knowledge of all functions must be combined simultaneously.

Garcia and Galatone (2002) describe the innovation process in terms of its deliverables and the nature of the process. On one hand, they address the technological development of an invention *combined* with marketing follow–through, through adoption and diffusion, to the end user. On the other hand, they focus their attention on the iterative nature of the process, indicating that several introductions are required in order to improve the invention until it reaches the state of a successful innovation.

The innovation process can be derived from two perspectives: source–based and user–based (Klein, Sorra, 1994). The *source–based* perspective follows the creation of a new product idea to market, as a

process beginning with research and continuing through development, testing, manufacturing, marketing, and distribution. The innovation has been created for the market (Tornatzky, Fleischer, 1990). Seen from the *user–based* perspective, the innovation process takes the opposite direction, beginning with the users' awareness of a need to absorb the innovation into the repertoire of the consumer's behavior. This process is described as transforming from awareness, selection, adoption, and implementation, until it finally becomes routine (Nord, Tucker, 1987).

Norman (1971) describes the process of product development that starts with an idea or conceptualization of a certain constellation of product dimensions. The idea is materialized into a concrete product, with changes being made in the set of dimensions and in the absolute and relative importance of the various dimensions of the product during development.

The R&D process can be described in generic terms as different stages of project development: start–up, failure, breakthrough, and new product introduction. Another theoretical aspect (Kelm, Nayanan, Pinches, 1995) is to divide the R&D process into the *innovation stage* and the *commercialization stage* of an R&D project. This view primarily examines the innovation process in isolation in a laboratory environment, and it represents a narrow view of the definition of an innovation. This view does not apparently require the innovation to be a commercial success.

Nord and Tucker (1987) have focused on the intersection between the innovation and adoption processes, raising the question of whether or not these two aspects should be distinguished. The results of their empirical research suggested that once the users passed the innovation process, the adoption process appeared trivial.

2.1.6 Success Factors of Innovation

The product development research has been categorized by Brown and Eisenhardt (1995) into four streams or success factors: development as a rational plan, development as a matter of communication, and development as problem solving. They propose a model (see Figure 14) that pictures the relationship among these four routes to success and present a theoretical concept that organizes them. The four streams of success factors to achieving a winning product development performance are summarized:

1) The *project team*, the project leader, and the senior management most closely affect:
2) *Development process performance*, in terms of speed and productivity of product development. Criteria for process performance are the organization's capabilities for problem solving and the resources available to the team.
3) The project leader, the customers, and senior management are closely related to achieving *product effectiveness,* and how well it fits with firm competences and market need. It is assumed that this perspective is driven by the input of the leader, senior management, and the customer shaping a guiding product vision; whereas attention on the process is of less importance.
4) The combination of process performance and product affectivity *yields financial success*, in terms of revenues, profitability, and market share.

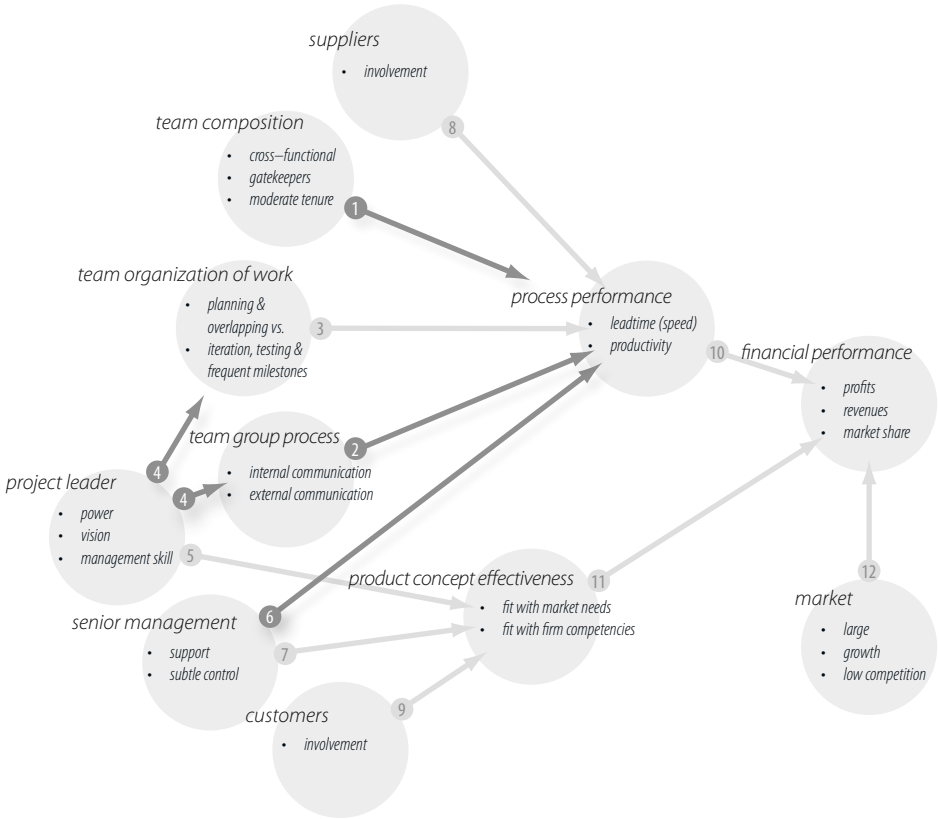

Figure 14. Factors Affecting the Success of Product–Development Projects (Source: Brown and Eisenhardt, 1995).

In the literature review, innovation is positioned at the center of the long–term survival of a firm. The label 'senior management *support*' is controversial. If the firm's long–term survival is the issue, and the role of senior management is merely to *support* the innovation process in an issue that may be fatal to the firm, it indicates that there is a gap in our knowledge about the creation of innovations. Brown and Eisenhardt (1995) arrived at the same conclusions in their study of contemporary product development research: 'Our understanding of how senior management affect development is incomplete. The management–related concepts such as vision, subtle control, and even support are vague'.

2.2 Environment and Situation

The firm and organization, it is argued (Cyert, March, 1963), is sensitive to the environmental situation. Stable or changing environments have fundamental implications for the firm. Both the leadership and the firm structure are to be seen as a consequence of the environment (Burns, Stalker 1963, Cyert, March 1963). It follows, therefore, that a proper reading of the environment is the keystone[1] of the firm—every conclusion that follows from the view of the environment is only as good as the view of the environment. How, then, are unstable conditions seen or foreseen? The environment appears to be unlimited, and 'every reality is open to innumerable interpretations and descriptions' (Norman, 2001). If the environment is seen in terms of realities, it leads to a discussion in which the reality is socially constructed and ratified in the minds of the participants. This line of reasoning leads to social interaction in which truths or black boxes are confronted. This unbundling of conventional truths is referred to later in this book in the context of Actor Network Theory. If different perspectives are brought to bear in this search for new insights, it may result in new framings and new frames of reference for the environment. A sign of this happening is mirrored by perceptions that contemporary language appears insufficient to explain the new environment. This perception leads to the use of symbolic artifacts, defined as 'humanly designed objectivations of subjective and intersubjective (social) processes' (Norman, 2001). Organization structures that articulate decentralization, objects like landscaped offices that articulate transparency, and corporate symbols and signs are all examples of means articulating new ends. Stories can also act as artifacts in a process of creating new realities. The further association with business thinking is elaborated in this book with reference to such factors as the business model, vision, and mission.

1 A keystone is the large central stone in an arch, that keeps all the other stones in position, like in the structure of an arched bridge or church door.

If the environment is approached from a *contextual* angle, some definition of context may serve as a guide. Context can be defined as 'the *situation*, the *events*, or the *information* related to something particular, and that help you understand it better' (Longman, 1995). According to this way of thinking, the firm and the innovation would be the 'something particular', that would be better understood through the events and the situation around the firm and the use of the innovation. Another definition of context states that 'context is a collection of nearby people and objects, and changes of those objects over time' (Schmidt, Beigl, Gellersen, 1999). This definition extends the context of 'something particular' to both the spatial proximity and the human interaction dimension. The proponents of Actor Network Theory, to be discussed later (in sub–section Interpreting the Associations and the Causality), strongly oppose the contextual view as a way of looking at the environment.

If the environment is approached from a situational angle, a similar outlook emerges, but from a slightly different mindset. A narrow interpretation of a situation comprises a point in 'time and space' (Belk, 1975). If we were to extend the interpretation of a situation, it would include 'behavioural settings' (Barker, 1968). A piano lesson serves as an example of an interval in time and space, as well as a clear expectation of a behavioral setting in that situation. It is argued that the time and space dimension and the behavioral setting dimension of the situation may extend to the environment. A perception of a courtroom situation illustrates the meaning of the situation extended to the environment. It is argued that the situation and the object combined stimulate the user and trigger certain behaviors, like the use of an innovation. Figure 15 illustrates the behavioral effect as a function of the person, the situation, and an associated object.

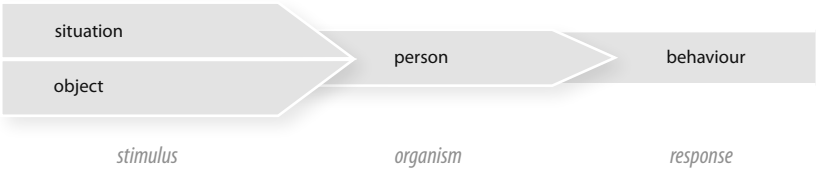

Figure 15. Situational Variables
(Source: Belk, 1975).

The 'situation changes the propensities'[2] and 'our worlds change with different situations'[3], and the *situation creates new propensities*. Belk (1975) suggested that there are five generic user dimensions of situation: *physical surroundings*, comprising the location, and featuring, for instance, weather, materials, sounds, merchandises; *social surroundings*, featuring such dimensions as the people present, their roles, and interaction; *temporal aspects* like time of day or season of the year; *task definition*, like the selection of a shop or information seeking; *antecedent states*, which include transitory moods, such as anxiety, pleasantness, and transitory conditions such as cash at hand or illness.

The task of leadership interpreting the environment can lead in various directions. It may derive from the market as a factor of emerging disruptive technologies (Christensen, 1997), natural changes, accidents, culture, consumer behavior, or competition, for instance—connecting back to the sub–section The Rise of Opportunity.

One important reason for examining the environment is to bring some level of predictability into an unstable world. When a coalition has collectively managed to define categories of circumstances, things become predictable (Christensen, Raynor, 2003). Any conclusion is better than

2 As philosopher Karl R. Popper stated in his address at the *World Congress of Philosophy* in Brighton in 1988.

3 Prof. Kim Wikström's Inaugural address for the Professorship in Industrial Management, 24 September 2004, published by the Foundation for Project Research.

none, for the sake of developing a purpose of the firm, which again is the keystone question for organizing collective action.

2.3 Purpose of the Firm

If the argument about the *purpose of the firm* is taken to its core, the theory of rational *profit seeking* and the *output*—what the firm delivers—are the most fundamental purposes of the organization (Cyert, March 1963). The definition falls just short of being too narrow, as it omits aspects that are directly connected to the purpose of the firm. The debate over a shareholder–dominated definition of the purpose of the firm does not come as surprise; it is fundamental, and results in consequences in several fields and considerations of the firm. The statement of the purpose is somewhat confused by various levels in the hierarchy in which the definition is applied. Furthermore, when the purpose is seen as a consequence of the environment, it follows that the definition of the purpose of the firm is not fixed over time.

In general managerial terms, the purpose of the firm is usually stated as the *mission*—a higher strategic meaning of the firm. If the mission is seen as part of the strategy agenda, it includes a statement about how the firm is acting with respect to its competitive environment (Mintzberg, 1994). The mission of the firm is largely seen, not as related to the time factor, but in the domain of creating value in the environment in which the firm participates. In a managerial sense, it defines 'what role the firm has in what larger system' (Norman, 2001).

There are ways to define the fundamental purpose of the firm, other than the rational, moneymaking purpose. The discussion about the purpose of the organization alludes to the human domain of the firm, in which attention is drawn to entrepreneurial interests associated with 'general organizational preferences' that emerge through interaction among participants inside or outside the organization (Cyert, March 1963). Thus,

the span of interpretation of the purpose ranges from the individual to the collective. Individual motives come to play a vital part in the definition of the firm. Drawing from entrepreneurial theory, a primary motive like the long–run survival of the firm introduces a substantial element of subjectivity into the reason for the firm's existence. Furthermore, the purpose also ranges between general ambition and specific goals, which is introduced later in the discussion about organizational goals.

The dynamic nature of the purpose of the firm must enter the discussion, as the purpose is related to interpretations of opportunities in a changing environment. The purpose defined by the top management has no meaning, unless in association with the environment. If the purpose of the firm becomes outdated, it drops out of competition and vanishes from the market. Any judgment is difficult, therefore, as the environment must be looked at from *some* chosen point of view. It is a problem of reducing from the mass of everything in the environment and choosing what is applicable, relevant, and interesting for the firm (Bernard, 1938). The role of senior management is chiefly to foresee and interpret changes in the environment and to communicate with the organization (Burns, Stalker 1963). An organization is ruled by more than one purpose, a point that is discussed further in the later sub–section Multiplicity of Systems. Thus there is always a competition of purposes in the organization (Herberts, 1945).

The statement about the purpose of the firm is the keystone, which contains a fraction of what unites all the elements of general management in the firm. Assume for the sake of argument and clarity that, in this discussion and in general terms, the purpose of the firm states the latent expected output of the firm: profit and delivery of output. This path leads the discussion into the leadership means of that achievement.

2.4 Direction of the Firm

Assume that we have defined the purpose of the firm that frames the ethos of the firm as delivering some output and making profit. From this follows the discussion about the administrative focus on the executives dealing with the actors employed for realizing the purpose of the firm. Certain choices outlining the direction of the business model or the firm's strategy have a connection to and influence the firm's ability to innovate.

2.4.7 Business Model

The behavioral theory of the firm was formulated in the early 1960s, whereas the breakthrough of the *business model* occurred in the late 1990s. The purpose of introducing the Business Model in this discussion is to present a contemporary interpretation of the firm's setting, but also to provide a contrast to the basic view of the organization pictured by the theory of the firm. Just as the theory of the firm provides a predictor of output of the business organization, the business model is a conceptual principle—a 'theory' of the firm set by senior management on how to serve the market.

The term *business model* was studied as a cultural phenomenon by Gahziani and Ventresca in 2005. The search tracked the use of the term in the press, by examining more than 500 journal abstracts over a 25–year period. The term has been widely adopted among entrepreneurs, lawyers, and venture capitalists, and is used in business management, computing, IT, marketing, advertising, purchasing, banking, and finance. Consequently, it is not surprising that there is no clear consensus over the meaning that each of these communities has given to *business model*. One of the underlying reasons is probably the rapid popularization of the conception, as shown in Figure 16.

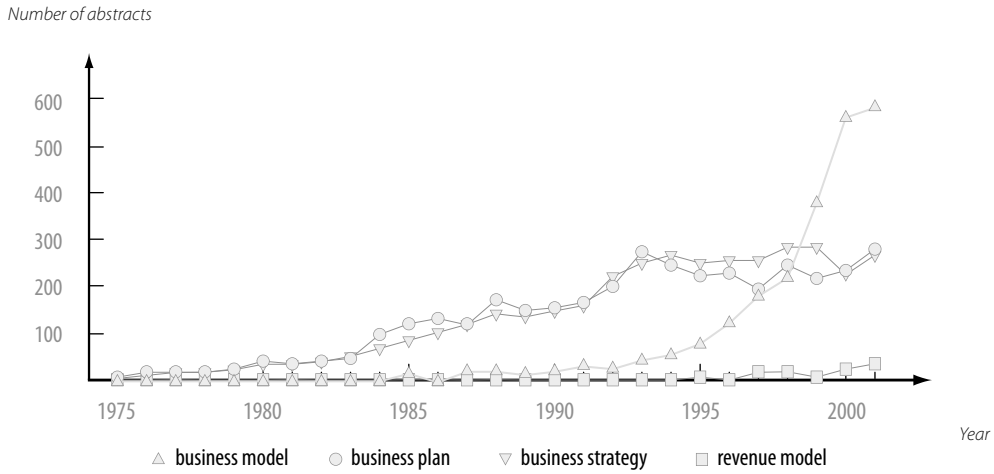

Figure 16. Incidence of Business Model and Related Management Keywords 1975–2001 (Source: Ghaziani et al., 2005).

The increased availability and use of the personal computer has been extremely helpful in popularizing the business model (Shim, McGlade, 1984), while telling something about its origins. In the 1960s, computing took many years to be completed, and cumbersome programming was used in large corporations to deliver *proforma* financial statements. Along with advancement of computer technology in late 1970s, the *corporate planning model* had spread to almost all US Fortune 100 companies, primarily serving as a tool for simulation and optimization.

The term *business model* was propelled at the dawn of the popularization of Internet and the World Wide Web—during the breakthrough of technology. The change evidently happened hand in hand with new prospects for business, which in the most radical statements was said to have rewritten the basic rules of the economy (Kotha, 1998), also called the new Digital Economy. At the dawning of the major, indefinite e–commerce, discontinuity opened the field for local interpretation in those communities participating in the change.

Frame	1975–1989	1990–1994	1995–2000	Raw totals	Percentage of total public talk
Value creation	1 (0.0)	7 (5.5)	81 (23.8)	89	17.6
Tacit conception	4 (0.1)	25 (19.5)	55 (16.1)	84	16.6
Revenue model	0	13 (10.2)	58 (17.0)	71	14.0
Electronic commerce	0	7 (5.5)	57 (16.7)	64	12.6
Computer/systems modeling	28 (0.7)	19 (14.8)	13 (3.8)	60	11.8
Relationship management	0	17 (13.3)	35 (10.3)	52	10.3
Business strategy	0	11 (8.6)	14 (4.1)	25	4.9
Varied other	3 (0.1)	12 (9.4)	5 (1.5)	20	3.9
Business plan	2 (0.1)	3 (2.3)	13 (3.8)	18	3.6
Organization design	0 5 (3.9)	9 (2.6)	14	2.8	...
Globalization	0	9 (7.0)	1 (0.3)	10	2.0
Time block totals	38	128	341	507	100
Percentage of total public talk	8	25	67	100	...
N = 507. ( ): Counts as percentage of total public talk within respective time block.					

Table 1. Reference Frame Frequencies by Period 1975–2000 (Source: Ghaziani et al. December, 2005).

As shown in Table 1, the term business model seems to be more strongly related to value creation, a revenue model, electronic commerce, and tacit conception. The table further demonstrates the diversity of interpretations when the conceptions of a computer system model, relationship management, and globalization are compared, for instance. The computer system model connotation, in particular, highlights the association between the information technology dimension and the distinct community of those engaged in that business.

Why does it matter? Drawing from the theory of the firm there is

the fundamental need of the firm to have a purpose. Beyond defining the purpose, however, the Business Model also tells in a sense–making way how it comes about (Magretta, 2002). What is the difference, then, between this model and the recipe brought about in the past as the business strategy? There is likely a good deal of overlap, as the terms *strategy* and *business model* are frequently confused. One interpretation is that the business model appears to be a reflection of greater freedom of movement, and the less predefined and given structural elements of the firm are not included. If the strategy smells of a *plan* of being competitive, the business model is more of a *story* of doing, and the effect of that doing. Critics of the school of strategy point to the shortcomings of strategy analysis: it delivers parts of the whole rather than a synthesis of the whole (Mintzberg, 1994). Research indicates that both the business model and strategy affect the market value of the firm (Zott and Amit, 2008), when firms have a *novelty–centered business model* in combination with various market strategies (Porter, 1985). No significant differences have been found, however, between *efficiency–centered business models* and various market strategies.

An Example of a Business Model: In 1998, *Forbes* published an article about the new business model of selling books on–line, identifying it as the invention of Amazon.com. A brief abstract of that article portrays an imminent example of a business model. The purpose of the exercise is to demonstrate the complexity of dealing with the question: 'What is a business model?'

> Amazon's rise to some extent reflects elements of its business model. For starters, the firm got to its market first. The Amazon site also exploits the Net's potential to build what analysts call a community around a product. Amazon's ability to maintain records of customer preferences and then act on that information gives it yet another advantage as an online retailer. Finally, it helps that books are quasi commodities—there is no need to try them on before you buy—and that they are small–ticket, impulse items

> that are easy to ship … Amazon's greatest contribution to Internet commerce may be that it has alerted consumers to some of the pleasures of online shopping (Forbes, 1998).

One interpretation of what constitutes the business model can be the elements and the relationships among time–to–market, transaction content, transaction structure, the revenue model, and creation of value. The transaction content is selling books and utilizing customer preference databases. The community around the product is tied to the selling of books, which can be labeled a component of the transaction structure. The whole of it creates value in terms of the pleasure that consumers experience once they start using online shopping. The essence of the revenue model is addressed in the business model through the 'small–ticket impulse item that is easy to ship' (Kotha, 1998), which facilitates the transaction, builds revenues, and may build profit. The business strategy aspect can be seen in the comparison with ordinary retailers, where the information occurs as a comparative advantage.

Another interpretation of the Amazon business model is the perception that it can delineate characters, plausible motivations, and a plot on insight about value (Magretta, 2002). If so, it may have been the judgment of Amazon.com management that convenience and pleasure, which are probably the prime value creations filled by the company, would serve as two primary drivers of motivation. The Amazon story links to Magretta's suggestion, through the known character of the product, the book, which has ideal features for the delivery process, but also associates the buyer with other likeminded people of the community and links into the business model through a technological solution combining these two. Evidently, this was also a good story, which appears as familiar elements to the general public, yet assembled in a seducing way.

The implication of the business model approach is that the logic places greater emphasis on management mobilizing and using resources than it does on them formally acquiring and owning the resources needed

for the business model (Norman, 2001). There is an assumption of a large–scale recombination of resources and reconfiguration of the firm, aimed at loosening the constraints and taking advantage of the opportunities that new technology brings.

2.4.8 Strategy

Strategy is approached in this book as the consistent behaviors of the organization that are established in response to the environment of the firm and the actors on the market. The school of strategy represents an earlier school of thought compared to the business model. The major distinction between the strategy and the business model is their positioning relative to the discussion about competition. The Treacy and Wiersema (1997) propositions of strategy builds on the Porter's (1985) classic *generic strategies* theory, illustrated in Figure 17, which emphasizes the nature of strategic thinking; it defines the orientation of the firm or how it will compete in the market.

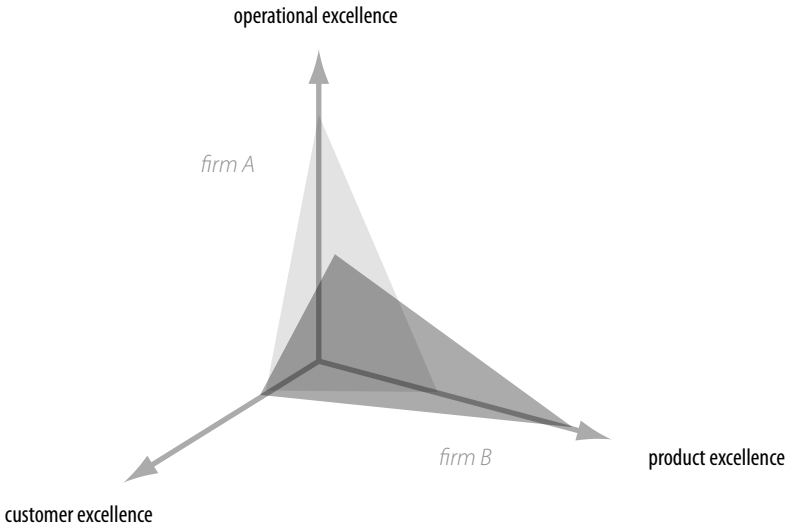

Figure 17. An Adaptation of Porter's Generic Strategies (Source: Treacy and Wiersema, 1997).

In brief, the theory assumes that each firm has three qualities: product orientation, operational orientation, and customer orientation. Yet, in a competitive environment, some choose to compete with their emphasis on excellent products, and to downplay the other two capabilities. The market situation shapes the orientation of each competing firm in that market. If the firm lacks distinctive strengths, it runs the risk of being 'stuck in the middle' (Porter, 1985), rendering it vulnerable to defeat. Each direction of orientation assumes certain traits of the firm, which simultaneously assumes a deliberate choice away from certain other traits. It is not merely a question about choosing and deciding firm orientation, however. The organization's behavior and abilities introduce the limitations of the collective, in which the question of individual interests and mutual agreement also come into play. This notion is further elaborated upon in the section about organization of the firm, more specifically in the Organization Behavior section.

The choice of strategic orientation has far–reaching implications for the organizational structure, critical processes, management systems, and company culture. A brief overview is presented in order to provide a better understanding of the various possible directions and how they correspond to the fundamentals of the firm. All the firms participating in this study explicitly committed themselves to the study for aspiring or applying the generic strategy of Product Excellence.

	Operational	Product	Customer
Customer value	Overall beneficial Convenience	Operationally superior product Reformulating the industry standards and expectations	Solution tailored to the customers' needs Long–term and learning customer relations
Critical process	Delivery/distribution of the product or service Base customer service	Creating new ideas Product development Market penetration	Finding new ideas Implementing solutions Relationship marketing
Structure	Strictly managed Centrally controlled Low empowerment Standardizing processes widely in the firm	Liberally managed Allowing entrepreneurship Avoid bureaucracy Continuously changing	Empowering the ones close to the customer
Leadership and management system	Continuous tracking of operational performance	Result focused and oriented Drive renewal	Customer–focused tracking and reward systems
Company culture	Encourage efficiency and avoid extravagance	Encourages imagination and critical questioning	Encourages individual customer service and long–term relationships

Table 2. Organizational Implications of Generic Strategies (Source: adaptation of Trace and Wiersema, 1997).

Table 2 clearly demonstrates the distinctions of the three generic strategies. However, is the strategy of the firm explicitly chosen? How does it come about? The search for the answer likely begins with an examination of the environment. If the table is set on the market, competitive differentiation derives from the possibilities available under market conditions that are interpreted to apply. One could also argue that

it is the force of bureaucracy—the operating system of the organization itself—that may bring about the formulation of the strategy. A third factor is the force of leadership, which may introduce a mediating interpretation of the market and the bureaucracy in the formulation of the strategy.

As a starting point, one should examine 'the strategy as something explicit, developed consciously and purposefully, and made in advance of the decisions to which it applies' (Mintzberg, 1978). The purpose of the firm unites the strategy, the organization, and its management. The span between the intended strategy and the realized strategy may or may not go as planned. As shown in Figure 18, if the deliberate strategy goes as planned, the outcome is as programmed and controlled by management. Then again, a planned firm strategy does not always apply for one of two reasons. 1) The strategy may be *unrealized*, due to false expectations and interpretations of the market; or the implementation may not have been successful. 2) Alternatively, there may have been *emergent* strategies that were not intended and were substituted for an intended strategy.

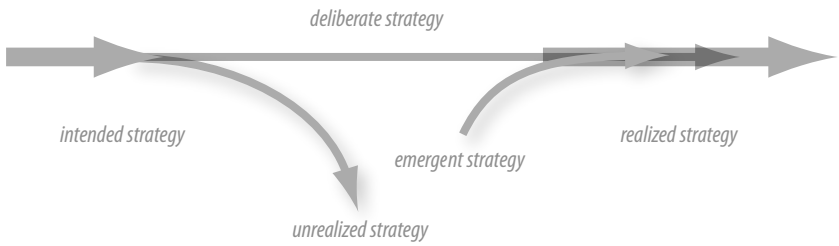

Figure 18. Types of Strategies
(Source: Mintzberg, 1978).

Mintzberg (1978) has criticized the practice of applying strategic thinking in conjunction with situations in which the firm faces a confusing situation and future. I interpret this to mean that strategy is also debatable in conjunction to innovation. Applying strategy as using normative

techniques of analysis and planning in a confusing situation does not work, when the management is unable to provide accurately goals, accurate schedule the planning, and provide an explicit definition of the result. It may be productive to reverse, not going to the extreme of declaring strategy dead, but following the prescribed orientation of product excellence–seeking strategies.

Assume that we limit the sophistication of the strategic agenda, and still expect to create purposeful and collective action. For the sake of argument, say that we limit strategy to defining merely the *vision* of the firm and leaving all the rest undefined. By definition (Norman, 2001), the vision is about the future, about the gap between the present state and the imagined future state. Furthermore, the concept of the vision also tells about the effects on the external world, and the future state of the organization. Is this enough *explicit* guidance for repetitively innovative companies? The purpose here was not to rewrite the concept of strategy—merely to propose how to elaborate a more applicable interpretation of strategy in connection to an ambiguous environment, in which strategy appears to be a misfit concept. Should the rest of innovation be left outside the explicit and formal domain in which strategy and planning apply, and rely largely upon the informal systems of the organization in the quest for innovation?

2.5 Organization of the Firm

Assume that the interpretation of the environment has created the purpose and direction of the firm. What, then, are the essential aspects of organizing the forces in order to fulfill the purpose of the firm that includes innovation? What comprises the organization and how does it work? Is it a machine or an organism? This section on organization and management is a response to these questions; it addresses generic administrative *principles*, theories about *organization behavior* and *managerial*

measures associated with the delivery of innovations. A description of the organization as a whole is needed in order to articulate the ground rules related to organizing innovation as a part of whole entity of the firm.

According to the Longman Dictionary the term 'organization' refers to 'a *group* that has been *formed* for a particular *purpose* and with the intent to *do something* and *accomplish something*'. Two other interpretations are 'the way of *coordination* of the *parts* of the *system*' or '*planning* and *effective* arrangement'. According to the theory of the firm, an alternative is a 'coalition of individuals', in which the participants are seen as individuals with 'different preference orderings'. The coalitions may be managers, workers, suppliers, or customers, for example (Cyert, March 1963). A vital starting point is to count on there being diversity and a multiplicity of goals among the individuals in each coalition.

On the general level, organization theory can be regarded from an administrative angle, in the sense that it focuses on the problem of an executive dealing with an organization. The administrative view addresses matters like centralization vs. decentralization, and the problems of coordination. A complimentary understanding is also presented by addressing some features of the bureaucratic aspect of the firm. Both domains of the organization are about controlling the formal organization, whereas the latter is distinctively operated by a large number of officials who are employed to follow the system and the rules. Finally, some aspects of the sociological character of the organization are also presented, addressing, in particular, the criteria for defining the efficiency of the organization. This last aspect in this section introduces attributes of the informal organization.

In the following sub–section 'Administrative Principles' attention is primarily reduced to considering the basic formal organization. In a later section, Organizational Behavior, the arguments of the formal view are relaxed when the role of innovation is elevated in the discussion. The role of the individual is considered anew in the next section.

2.5.1 Administrative Principles

The administrative principles cover those specific areas of explicit effort comprising formal organizations. The areas covered build on a number of *organizational measures and principles* that solve the problem of the executive dealing with the making of the organization. It is evident that the principles neither address nor comply with the necessities of an innovative firm. It is vital, however, to be aware of the goings–on of a working organization when it operates in a business–as–usual mode—when the environment is stable and the future is relatively predictable.

2.5.1.1 Antecedents of Administrative Efficiency

Three distinct administrative dimensions of efficiency prevail in the literature as the basis for the effective working organization: the principle of *specialization*, or groupings according to *task*; the *line of command*; and the *span of control* (Simon, 1945). The prevailing situation determines the balance among these three rules.

Turning first to *task specialization* within the group, specialization is a means to an end, either directly or indirectly influencing the purpose or general ends of the firm. The efficiency of the cooperation depends largely upon inventive ways of specializing, which fit with the ends on both the general and the detailed level (Bernard, 1938). Specialization is another term for division of labor or functionalization. Specialization has the connotation of a person–level discussion. Functionalization is located in discussions about large organizations; whereas division of labor is a macro–economic expression. In any case, different persons within the group are doing and concentrating on different things, while simultaneously engaged in a person–to–person cooperative effort.

Five general types of organizational specialization have been proposed by Bernard: 1) the place where the work is accomplished, which refers to

the geographical considerations and choices of the firm; 2) the people who accomplish the work or associational specialization, which becomes visible in general sayings like 'they are used to working together' or 'you don't know people until you've worked with them'; 3) the time during which the work is accomplished, which reflects seasonal fluctuations, for instance; 4) the things with which the work is accomplished, such as the materials used in a process that delivers a certain product; and 5) the method or process by which the work is accomplished. An alternative typology of specialization has been proposed by Simon (1945), who highlights the place and the process as criteria for reaching administrative efficiency, but adds specialization according to purpose and clientele. The people who accomplish the work constitute a particular area of interest from a leadership perspective, because it connects to the discussion about informal organizations (Bernard 1938).

A second aspect of organizational efficiency is *line of command*, sometimes referred to as *unity of command.* It is assumed to increase managerial and governmental efficiency by arranging group members in a hierarchy. The principle builds on the idea that an employee cannot obey two different commands. This introduces the behavior of obeying authority by following the decision of a superior in the organization, without using one's own judgment about the merits of that decision. Authority is best used in the organization in a decision–making situation at the point of the organization where it can be made with the greatest expertise.

Another aspect of organizational efficiency is the assumption that the organization will be more efficient the narrower its *span of control*—the fewer the subordinates who report to one manager. The balance between the benefits of centralization vs. decentralization comes on the agenda. To be efficient, Simon argues, it is advisable to minimize the number of organizational levels with information that needs to be passed on to the place of action. Evidently, there is a conflict and a trade–off in larger firms if the optimal number of specialized subordinates is 5 to 10 and the number of

the organizational levels are kept to a minimum.

These three principles of organizational efficiency—specialization, line of command or unity of command, and span of control—are vital, yet no one of them is sufficient for designing an efficient administration. Each situation must be examined with all the efficiency criteria of these principles. Some of the principles are mutually incompatible in certain situations in which overall efficiency is the guiding star. Advantages and disadvantages must then be balanced—just like an architect must do when weighing the advantages of additional kitchen space with the disadvantages of a smaller dining room. The purpose is the leading criterion.

2.5.1.2 Business Goals and Goals

Another aspect of creating an effective organization highlights the goals and the setting of goals in the firm. The goals here correspond in specific terms to the general purpose of the firm. Both come to reflect the merits of success or the criteria upon which efficiency is judged. Like the administrative principles, business goals are one of the vital elements that influence individuals and groups in the firm. The goals correspond to the similar motives and interests of individuals, based on the groups formed. The motives are reinforced by rewards stimulating the will to participate in achieving the goals of organizational growth. To simplify, we can say that there are two general types of goals: personal goals and organizational goals. Organizational goals will be addressed primarily in this context; the individual aspects are discussed later under 'Actors of Innovation'.

Just as the organization is a hierarchy of actors, there is a similar hierarchy of goals. From a formal and legal standpoint, the motives of the owners and top managers are major forces in the determination of goals[4]. Consequently, those goals become input for the decision–making process and for action. (Decision making is addressed later in the section entitled

4 There is rarely one goal, but many. There is rarely a clear goal, but a search for it. Furthermore, there are rarely goals without constraints.

'Administrative Principles'). In strong hierarchy, the organizational goals are usually the goals of the top manager, and conformity is purchased with inducements like wages, premiums, interest, and managerial attention. The goals are supported by a system of internal control that keeps the staff aware of the entrepreneurial demands (Burns, Stalker 1963).

Another type of organizational goal may emerge as a collective consensus. A consensus goal solution may look like a priori goals—superior customer service, for instance, or profit making, or any other goal determined through small–group discussion. In each case, individual desires are subordinated to the collective goal, a goal that comes to articulate an organizational role and with all the constraints that accompany any consensus. Consequently, consensus goals stimulate the discovery of courses of action that satisfy those constraints. According to the rational view of the firm, five generic goals eventually rule behavior in any industrial firm: production goals, inventory goals, sales goals, market share goals, and profit goals (Burns, Stalker et al.).

> *Sales goals* are assumed to engage the minds of most participants in a business firm; in order to survive, to pay employees, and to meet other commitments, goods must be sold. Demands on the sales organization, however, are not uniform. Certain members of the organization put pressure on sales effectiveness, others on the volume to be delivered, some on products to be sold, and so on. Striving for a certain level of sales plainly provides a trigger for different types of organizational behavior.
>
> *Production goals,* primarily introduced by the production operations, generally reflect the goal of smoothing production, creating stable scheduling and employment, and meeting or exceeding production levels. The origin of pressure and what unites production goals and business goals is the requirement to develop acceptable cost performance and growth of output volume.
>
> *Inventory goals* primarily summarize demands by the sales force and customers who want to avoid an out–of–stock situation and

need for complete deliveries from the firm. There is a demand for a reliable source of materials. The pressure comes partly from the department itself, but it is also built up by the expectation of being a buffer between the sales and the production departments.

Market–share goals represent a summary of those demands from the parts of the organization concerned with successful market competition and growth. A market–share goal addresses concerns about the achievements of top managers in the sales department. This goal is of particular interest, therefore, in discussions about company strategy, which address the competitive performance of the firm.

Profit goals appear as a demand for distributing profits and tracking the performance of top management. Every member of the organization is probably concerned about the firm having a profit goal and making a profit. Without profit goals and the resulting profits, there are no resources to redistribute funds in the form of capital investments, shareholders receive no dividends, creditors have no amortization on loans, and employees receive no compensation. Profit goals are usually expressed monetarily.

These deliberations about the generic goals of the firm are meant to complement later discussions about the formal vs. informal and mechanistic vs. organic views of collective behavior in organizations. It is assumed that they are closely connected to the abilities of the innovative firm.

2.5.1.3 Decision–Making Process

In line with the purpose of the firm, the direction of the firm, and the organizational setting, what do the top managers encounter as they go from a new idea to a decision? Assuming the multiplicity of a firm's goals, why and how do the minds in an organization come together consistently enough for a collective effort? Individuals tend to have different demands, drifting attention, and a limited possibility to be represented in all

matters of the firm. The goals of the firm change gradually, except in dramatic situations. Personal experience has an impact on how goals are reformulated. Earlier reasoning was that the initiative originates entrepreneurially or is generated by a collective.

In this sub–section, the decision–making process is regarded from two perspectives on how the organization deals with impulses and reaches a decision: the information processing view and the new knowledge creation view. The information processing view illustrates formal aspects of information processing and organizational choice related to the existing structure of decision making, whereas the new knowledge creation view is built on less formal structures. Both are vital to recognize, as both collective decision–making structures exist in the organization of all larger and mature firms.

Decision Making as Information Processing:

To examine decision making as information processing is to look at information processing as an interface between the firm and the environment (Cyert, March, 1963). According to the theory, the firm reacts to its environment through observation and interpretation. The attention is on how information is handled in a business firm and how impulses enter into the decision making of the firm. There is specialization in securing information that is similar to the specialization of tasks. There are practices for handling information; sales executives are responsible for information about orders the interest of the customers; and executives read trade journals to keep up with general business conditions. Certain professionals are keeping in contact with the source of information, and are competently reading the information available. It is argued that participants of the organization meet in a bargaining process and are kept together through a system of control.

It is assumed that participants in the group and coalitions are motivated to work under mutual agreement and are concerned with creating systems controlling and enforcing the mutual aim of the

organization. Participants consequently meet in a *bargaining process* in order to reach agreement over an end decision. As the process begins, the coalition is formed and its general terms are agreed upon. During the process, agreement is reached, consensus is stabilized, and the implications for the rest of the organization are agreed upon. Thus experience causes adjustments and a change of goals, and a mutual understanding is reached during the bargaining process by which group terms are substituted as a response to the changed situation.

The two major mutual *control systems* in a business organization are the budget and its allocation across functions of the firm. A budget plays two roles in a large–scale corporation. On one hand, it is used as a management control device to implement policies upon which executives have decided and to check achievement against established criteria. On the other hand, a budget is a device used to determine feasible programs. In either case, it tends to define—in advance—a set of fixed commitments and fixed expectations. The budget is an outright elaboration of prior commitments, and there are consequences of sanctions if the budget is exceeded. The budget serves as a limitation for individuals and subgroups trying to act outside their boundaries, and as a prohibition for other participants to be active in the fields assigned to other individuals or subgroups. The allocation of the budget rules over the division of labor and the associated specialization for the function.

The behavioral theory of the firm connects the information–processing proposal to yet another further view of organizational choice. It is argued that 'organizational choice is heavily conditioned with rules, organizational standard operating procedures, within which it occurs' (Cyert, March, 1963). That view draws attention to the firm as an adaptive rational institution, and introduces another view of behaviors that the firm encounters in the dialogue and the decision–making process. It is further argued that the firm relies on *standard operating procedures* as a programmed response to uncertainty. Standard operating procedures and rules are deeply rooted in the organization culture. The procedures are said to be like the

memory of the firm and pillars of the stability of the firm. Like memory, procedures are based on experience and learning, by which the firm adapts to its environment and builds up the sustainability of the procedural behavior. Certain general procedures of choice are associated with a predictable behavior of the organization. That is to say, the firm relies on certain specific procedures when implementing the general procedure.

It is proposed (Cyert, March, 1963) that the firm has three general procedures of choice. The firm deals with aims to

1) *avoid uncertainty* by creating procedures that minimize exposure for uncertain future events. When the organization has settled on its procedures, the collective abandons them only after bad experiences and considerable pressure. It is assumed that the firm comprises a large and complex set of decision procedures, making the redesign of the fundamentals of the system an overwhelming task. Consequently, the organization becomes cautious about change and has a built–in tendency to
2) *maintain the rules* . Assuming that the entire organization is built on individual judgment and that some flexibility is required, it becomes imperative that procedures and specifications of modification are clear. For the procedures to survive, the firm comes to prefer
3) *the use of simple rules*.

When lower–level procedures are labeled 'specific standard operating procedures', the nature of the procedures of organizational choice becomes more concrete. They are explicit and they change slowly, but they provide stability and distinct direction—routines—in recurring activities. At the same time, they are deterministic by nature. The rule–like nature of the procedures tells not only about an accumulation of past learning about best practices; the rules are also a control device. The rules have the effect of making behavior in the firm predictable, which is an essential quality for managing the firm.

When people ask questions like 'How is this done in this company?' 'How is the product fabricated?' four vital specific standard operating procedures apply:

1) The firm tends to have procedures with specific methods for fulfilling each task, like a primary memory, labeled *task performance rules*.
2) In every firm, a certain level of reporting serves the purpose of control and prediction. Uninterrupted reporting monitors certain aspects of the operation, like the profit and loss statements. One would assume that reports have a major impact on decision making about the operation of the firm. Like the task procedures, the rules of reports enable the organization to act efficiently in situations that are similar to those experienced in the past. An adjustment of reporting rules to accommodate changes in the environment is a complicated procedure, which is why the firm *continues recording and reporting*. The firm will attempt to use its existing model of the world and its existing records to deal with the change conditions.
3) In large firms, and along with expansion of e–communication and ERP systems, strong emphasis is placed on such factors as directing information, estimates, results, and performance indicators. It is a basic requirement that proper information be in the right place at right time, to enable well founded decision making. That is, in fact, the starting point, as the specialization of tasks is a well established principle, and there is the corresponding specialization of acquiring information. It follows, therefore, that the firm, by nature, sets a priority on collecting, filtering, condensing, routing, and distributing information by applying standard *information–handling rules*.
4) Firms plan and allocate resources among the options available, by allocating long–range capital expenditures, for example. The plan serves as the vehicle for influencing behavior in many

> ways, by establishing continuing, predetermined decisions in line with the plan. The plan is like a theory of the relationship between the factors of the plan—what is the connection between sales and profit, for example. The plan, like the budget, is an explication of the goal, predicting expected sales, cost, and profit. The major output influencing behavior, the behavior of upper management in particular, is the standard procedure of *plans and planning rules*.

A summarizing remark: The firm organization is above described as a machine, relying on certain formal structures. Cyert and March (p.188, 1963) themselves express doubts regarding the conception of a focus on the processing of the inflow of information and the theory of the firm for not explaining how the innovation occurs in the firm. It is merely argued that every business firm should 'adapt over time by learning simple decision rules and behavior rules' (Cyert, March, 1963).

Decision Making as New Knowledge Creation:

An alternative to the information processing view of the theory of the firm is to examine the decision–making process as a *new knowledge–creating process*, which feeds into the decision–making situation (Nonaka, Takeuchi 1995). The theory of knowledge creation proposes that innovative firms create knowledge and new information by relaxing what is understood as the problem and the solution—the means for making a change in the environment. Like Cyert and March's (1963) behavioral theory of the firm, the theory of knowledge creation concentrates not merely on the individual, but also on group coalitions and organizational and inter–organizational associations.

A point of departure comes from a major distinction between the conceptions of knowledge and information. Knowledge refers to beliefs, commitment, and action, and is always associated with a destination—elements to which information does not refer. Both knowledge and

information are expressions of context, related to and associated with a specific meaning. We can think of knowledge creation as a dynamic human process of justifying the personal belief toward the 'truth'—in short, justified belief. There is a relationship between information and knowledge, information being a flow of messages, whereas knowledge arises from that very flow when connected to the beliefs and the commitment of its holder.

The knowledge creation process happens in an expanding, interactive community that crosses the borders of organizations. Knowledge expands through the exchange between participants in a dialogue. It is argued (Nonaka, Takeuchi, 1995) that *knowledge conversion* occurs along the process of interaction between participants—from tacit to explicit knowledge and vice versa. Much of the clue to the theory of knowledge creation lies in the shifts between tacit and explicit knowledge. An example of tacit knowledge is knowledge based on experience or intuition, for example—something subjective that is difficult to express in words. Explicit knowledge is codified, and takes the form of explicit, documented texts, statistics, and manuals. The key to creating new knowledge lies in the transfer from tacit to explicit, through dialogue and mobilization.

As shown in Figure 19, the logic of knowledge creation lies in the four modes of knowledge conversion: the conversion and re–conversion of tacit and explicit knowledge. 1) Tacit–to–tacit knowledge is called *socialization*, 2) tacit–to–explicit knowledge is labeled *externalization*, 3) explicit–to–explicit knowledge is *combinations*, and 4) explicit–to–tacit is *internalization*.

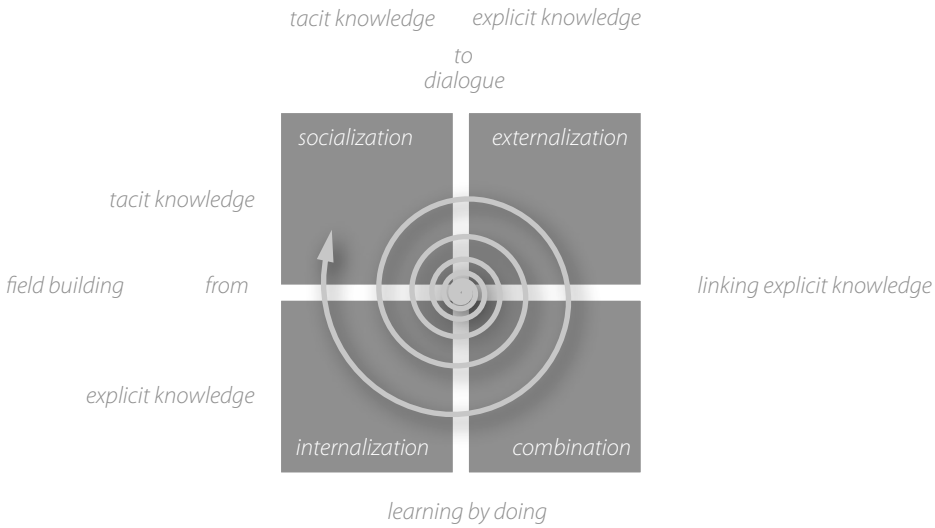

Figure 19. Knowledge Spiral and Knowledge Conversion (Source: Nonaka and Takeuchi, 1995).

Socialization, or experience sharing exists when tacit knowledge takes the shape of mental models and technical skills. On–the–job training is a typical example of this type of knowledge creation, as is artisanship—a skill learned not through verbal instruction, but by example, imitation, and practice. Tacit knowledge comes only through experience. Through *externalization,* tacit knowledge becomes concrete, as when intuition turns into a documented idea. An output of this knowledge conversion may take the form of metaphors, concepts, models, analogies, or hypotheses. The act of writing is a prime example of knowledge conversion of this mode. As the articulation is generally incomplete, it may trigger a purposeful dialogue and reflection among the participants, filling the gaps and thereby creating new knowledge. In *combinations*—explicit–to–explicit—it is about merging concepts into a new design of a system. In essence, two types of knowledge of the body are combined. New knowledge may emerge from existing data that is reconfigured through new combinations

or new categorization or by adding pieces of information. The explicit can be said to be converted into other forms of the explicit when a corporate vision is interpreted by division heads, forming new business concepts, for instance, or when a corporate vision leads product managers into new product concepts. When an individual or a coalition *internalizes* knowledge—when explicit knowledge converts to implicit knowledge—it follows powerful collectively shared mental models and technical expertise, through the processes of socialization (experience sharing), externalization (documentation), and combinations (system designs). In this case, knowledge in the form of verbal means, manuals, and stories serves as a means rather than an end to the process of growing knowledge. The common saying 'learning by doing' describes well the course of events that must occur in order for internalization to take place. Another form occurs when success stories are widely shared and remembered in the organization, and internalization becomes an attribute of the company culture.

It has been argued (Cyert, March, 1963) that adaptation over time is a vital ability of the firm to survive—the firm's ability to reassemble its structures to confront new market conditions. How can this phenomenon be described? Just as one proposal of many advances this discussion by taking the theory of knowledge creation a step further, the theory takes the creation of new knowledge from the individual into the domains of the group, from there to the whole organization, and finally, to the domains of inter–organizational coordination.

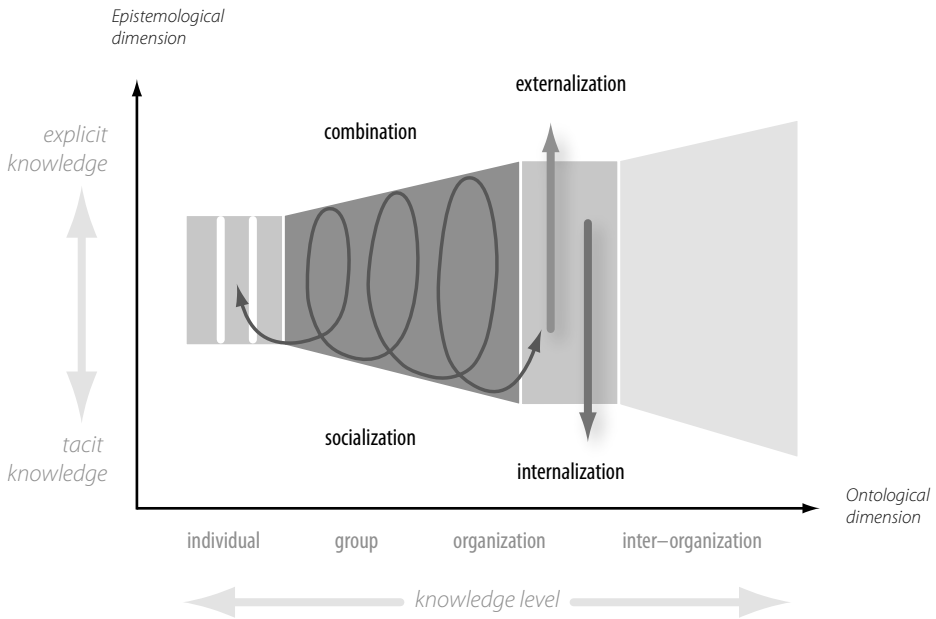

Figure 20. Spiral Organizational Knowledge Creation (Source: Nonaka and Takeuchi, 1995).

The elements of the model are the same, switching between explicit and tacit knowledge and the acts of dialogue, experimenting, building, combining with other things, mingling, and presenting. Nonaka and Takeuchi (1995) argue that the nature of knowledge creation is an iterative course of events, as illustrated in Figure 20. It may be assumed that the creation of new products and services follow the same pattern. Much simplified, it begins with individuals of various backgrounds and frames of reference. Marketing people are passionate over some things, production people are passionate over other things, and R&D people over yet other things. The frames of reference, experiences, motivations, and intentions combine only through socialization, when the voices behind the various minds speak aloud. At the same time, tacit and explicit knowledge are combined, allowing new insights to emerge. At the first attempt, or first cycle, the ends of the group may result in an excellent product. Yet, there

may be conflicts between the new product and the context—like the goals of other divisions—to which the product is about to belong. That triggers into motion a new circle of knowledge creation. The practical application takes place in boot camps, prototype environments, in documentation, and in meetings. The model is one suggestion of how the content of those interactions leads the innovation project forward into increasingly completed products.

A summarizing remark: the components of the knowledge–creating model connect with various fields of well known organization theory. Just as the socialization mode is connected to theories of group processes and organization culture, the combination mode connects to information–processing theories, and internalization mode is closely connected to theories of organizational learning.

The Decision

Decision making itself, as a complement to the views on information processing and organizational choice, and knowledge creation is the final aspect describing the executive's striving to go from idea to decision in an environment of administrative complexity. In general terms, decision making may be included in all the other views, because a good part of decision making occurs on an ongoing rate in the daily life of an organization—not necessarily one particular point in time, but only when the final decision is made. Now, however, the focus here is concentrated on the decision—the conscious, formal, deliberate calculated judgment of conclusive choice[5]. The conscious adoption of means to ends is a vital function of the formal organization.

Bernard (1938) has suggested that decisions in business firms are always directly or indirectly related to two domains of concern: 1) the purpose of the firm and 2) the world in which the firm operates. The world of the firm comprises the physical world, the social world, and the circum-

5 Not to make a decision is also a decision.

stantial things and forces around the firm. Decisions require conformity between the purpose of the firm and the world in which the firm operates. If the decision is reduced to a minimum, it has two parts: the desired *ends* and the *means*. The ends, like the installation of an assembly line, can be a means for a further end, like the delivery of SUV cars, which in turn may be subordinated to the more remote and ultimate end: a car fit for family leisure traveling.

In organizational theory, the acts within the organization are assumed to play a larger role than that of a personal agenda. Still, the two are clearly interlinked, and it may be agued that the two aspects of achievement is one of the vital elements that unite and sustain this relationship—the achievement of the participant and the achievement of the coalition of which the participant is a member. The relationship is by no means static. Both the nature and strength of the individual demands on the coalition vary over time. Such turmoil comes as consequence of such factors as gained experience, changes in the environment, and so on. The participant is further discussed in a later section, Actors of Innovation.

Changes occur as top executives delegate to the people who are implementing their decisions. Decisions made at the top level of the organization typically address the *ends* of the decision, whereas choice and shaping of the *means* are particular concerns of the lower levels of the organization; for people at the mid–level, their ends are the means of the top–level decisions. The role of middle management is to dismantle the purpose into decisions about specific ends. They could be decisions about technological problems, cost problems, or a variety of other issues in which action is of great importance. As a last resort, where decisions are delegated and where decisions are implemented, the prime concern is the technically correct conduct of the organization's action. It is at this lowest level of the organization where the ultimate level of authority resides—where the personal decision to contribute is of greatest importance. The success of the assignment builds on the individual knowledge of facts and purpose of the coalition or organization. That is why both the top and the lowest level of

decision making are vital for turning organizational intentions into results corresponding with the purpose of the firm.

Relatively speaking, the top executive's decisions are of primary importance, but because of the aggregated impact of the organization, the collective participation of non–executives should garner the greatest attention in managing the firm. The argument is supported by the claim that coordination of action requires repeat situational decisions in which the action occurs. It also explains the importance of the presence of the mid–level manager's role as decision maker: to facilitate the correct action.

The formulation and decision of the general organizational purpose or objective is a synthesizing process. It is argued (Bernard, 1938) that those decisions are decided, not solely by a fractional group like a management team. The firm's purpose lacks meaning if it is not translated into the action of the organization, including the last level and diverse branches of the firm where action is delegated and implemented. Those on the mid–level and lower are contributing to the decision–making process in another way, but not in a less important way. The argument appears contradictory when one considers that the location of hierarchical authority is commonly assumed to be at the top of the organization. The explanation is found in the intra–organizational communication process, however, and in the interactive decisions made in that process, underlying the formal structure of authority. The synthesizing of that process tunes in incompatible elements located at various points in the line of communication of the cooperative system in a working operational organizational system.

Just as the organization acts beside the authority of the hierarchical top, and deals with semi–finished formulations of goals, the organization can successfully handle decisions that are blatantly contradictory. This discussion opens with an example (Cyert, March, pp.166, 1963) of a condition of conflict in an industrial manufacturing firm:

> The sales department wants 1) specific tailoring of product specifications and individual delivery times to individual customer needs, and the production and finance department want 2) product standardization and delivery times consistent with production smoothing. Logically these demands are inconsistent.

The common situation seems to be a question of either/or. Nevertheless, let us consider the situation in which the solution is not a compromise. We have come to think that individuals have lists of organizational preferences that then infiltrate into the objectives of the firm. Assume for a moment, however, that members of the organization have a relatively disorganized pool of demands. Assume that at any time a member is aware of only a limited set of demands. It is reasonable to think that the demands require more attention than the member's involvement in the organization would allow, and of course there are demands of others on the member's attention. In situations in which the demands of conflicting interest occur simultaneously, the clash is avoided when the organization responds to the demands sequentially. Cyert and March (1963) suggest that the shift in focus of attention explains why organizations operate successfully, despite many conflicting goals and demands within the firm. Sometimes managerial attention may be focused on cutting costs, sometimes on making investments, and so on. In organizations in which *sequential attention* to problems occurs, what looks to an outsider like a contradiction is not contradictory to an insider, in cases in which the organization is temporarily able to avoid conditions which seem to be in fundamental conflict.

As demonstrated, the role of logic in decision making is controversial. It is generally assumed (Bernard, 1938) that decision making in organizations is usually justified with logic. If the decision is broken into parts, the mean and the ends, some credible conclusions can be attained. The end may be a consequence of a logical process. The distance ranging from an immediate end to the extremely remote end may bring in the difference.

The closer the end, the less the uncertainty; the further away and more general the end, the more it is distorted by organizational and environmental risk. It follows that most remote or general ends are probably arrived at as the result of an illogical influence process in which consensus plays a vital role. The means appear to be primarily a logical process of acts in which the ends have been decided. This builds argument on the assumption that the means are, in essence, a process of fact– or reasoning–based discrimination, analysis, and choice of alternatives. The logical process of means may be logical for the organization, yet not always logical to the individual. This situation arises when the participant cannot attend to all matters in the organization. The decision to close a factory in Europe and move it to China, for instance, may be based on a general conception that there will be no industrial work in Europe in the future—that it will all be moved to China. Individual factory workers probably do not share this view, which would cause them to lose their jobs and their incomes. Hence, the logic does not work the same way for the individual as for the firm. The individual factory worker would have not made such a decision, but the executives would.

In the end, purpose or goals conflicts are never fully settled in the firm. The testing of business thinking is impossible to complete. It follows, therefore, that the purpose or objectives are never fully rationalized. The extent of the bargaining process, when it ends, and when policy begins to be reconsidered (resulting from a demand from some part of the organization), hinges on the skills of the leaders to work out the decision process adequately. As has been seen, the decentralization of decision making and attention to goals, sequential attention to goals, and slack keeps the organization in a state of decision making, despite multiple, changing situations and inconsistent demands and goals.

In summary, this section focuses on the relevant organizational fundamentals upon which the firm is built: the corporate structures that are likely to be in place when implementing an innovation in a mature firm. These views combined provide different insights into what

management is likely to meet and which conditional premises are present in the attempt to bring innovations into the market: the interface between the environment and the firm funneling information into the decision–making situation, the making of business goals and objectives, the basic coordination and control mechanisms through the budget and planning processes, the iterative process of knowledge creation, the procedures of choice as a programming of the basic nature of the firm, and logic in the decision–making context. The rationale of building the theoretical section starting the reasoning of the formal organization lies in seeing, on one hand, the rigid nature of old firms, which, to some extent, elucidates why innovation is a contradictory and a difficult task. On the other hand, it is the same collective environment in which innovation thrives. The following journey into the behavioral dimension of the organization further relaxes the assumption of strict order in the firm.

2.5.2 Organization Behavior

The previous section was a description of the systemic traits of the organization, primarily a description of the thinking of the organization as rational and formal—a machine that omitted essential elements of the apparatus driven by the *minds of the organizational participant*s. This section is about the underlying forces encountered when making revolutionary things happen in firms. Although it does not provide explicit information about the active measures that make or break innovations in a firm, it does address some of the reasons why innovation does or does not materialize in a bureaucracy. The view of organizational interaction is first addressed, followed by a consideration of managerial constellations, thereby tying the theoretical discussion closer to organizational knowledge about what makes innovation likely to occur. To begin, the forces in the interaction are examined—forces like company values, company culture, identification with the organization, the role of authority, and willingness to contribute.

2.5.2.1 Values

It is commonly argued that innovation increases with diverse participants with different experiences and occupations, when decision making is decentralized and when coordination occurs in an informal domain of organization behavior and loose control of activity. Logically, for all these conditions to be present, top management must abdicate some power—a statement that appears, on the face of it, to be contradictory. In order for the whole situation to make sense, something is needed to complete the picture—something that could, perhaps, be labeled trust in the intentions and actions of people. In any situation in which individuals are forced to rely solely on their own judgment, they presumably strive for what they perceive as attractive and the right thing to do. What is the right thing to do draws the attention back to the firm's culture and the guiding values of the firm and the individual.

Values are a conception of the desirable: 'A *value* is a conception, explicit or implicit of the desirable in the organization which influences the selection from available modes, means, and ends of action' (Kluckhohn,1956). Values can be seen as *general beliefs* guiding judgment and actions that are projected on situations and objects in general. *Attitudes* are relatively enduring, and refer to another level of abstraction, being specific to the object, person, and situation. Attitudes are a reflection or an expression of underlying values. *Behavior* implies action resulting from motivation, and is derived from the attitudes and values. *Opinion* is a verbal expression of some belief, attitude, or value. Opinions may be insufficient to produce certainty, and are usually less enduring than attitudes and values are.

In innovation cases, there is evidence that the values of all participants are not equally significant predictors of success. It follows that there are different types of values in a firm and that they are held more or less strongly. The sets of values that exist in a firm, moreover, do not live in isolation from the external world. As shown in Figure 21, Brown (1976)

pictures a framework of four value categories, each different in kind, in effect, and in influence.

Figure 21. Values in Conflict
(Source: Brown, 1976).

In Brown's entire framework, values are, in any case, effective on an individual level. As the individual possesses both a participant's role in the organization and a role as an individual in society, the organization comes under the influence of values that do not conform with values that would fulfil the purpose of the organization. A major example is the societal value of democracy and freedom of initiative—values that tend to be common throughout most of the western world. Applied in a company environment in which objective hierarchical behavior predominantly rules, however, the same beliefs could cause fatal collisions with the individual's manager. Such externals as family and friends influence employees' opinions. It may be difficult in company debates, therefore, to know the grounds on which people are arguing. Some of their arguments may be based on the values and opinions of people who are not even present.

It can be assumed, however, that there are inherent and general values like an exciting life, a sense of accomplishment, and family security. When the view is from the perspective of the manager, there is a tendency for the manager to project his or her own values upon the individual, for besides being an individual, the manager has a formal position of authority over the individual employee. In a relationship suffering from poor communication and difficult personalities, the cause likely lies on a level at which the values of two individuals are not in agreement, where the feeling of open communication has been lost. What, then, are company values?

If the nature of values is individual, perhaps it is the sum of the parts, a synthesis of all the actual values of each individual. In that sense, then, the publicly stated values of the firm are relatively powerless. If company values serve as an attraction to new participants, however, there may be magnetism in the value statement of the organization. A classical example is the French labor movement's cry of *liberté, eglité, fraternité*, which gained power through its participants to change the world.[6]

It becomes evident that values are, to a large degree, outside of managerial control. If values are general and permanent and if tendencies from the environment about how a human decides destination and priorities on the everyday level[7] are adapted, one could say that there is little the manager can do about values. Still, the temptation to do something appears to be rewarding. The selection of professionals, the appraisal of subordinates, and the example of the leader directs the course of organizational values. Liked–minded employees will probably follow a manager who radiates broad–mindedness, ambition, capability, courage, honesty, and imagination. The senior manager's failure to understand how values work is a major cause of conflict at the interface between lower mangers and the organization (Brown, 1976). Senior management will fall

6 Societal examples from Finland are 'home, religion, and the land of the father'. The cornerstones of ethics from ancient Greece were 'beauty, truth, goodness; the example from the Olympic organization was '*citius, altius, fortius*'.

7 Philosopher Erik Allardt interview, article in Hufvudstadsbladet 28.10.2007.

victim to micro–management if the organization is overly controlled; trust and good faith in the judgment of the individual employee is demanded.

Larger and decentralized organizations operating under ongoing change are forced to identify themselves with something more enduring, and at the same time less specific, in order to maintain the ability to cooperate. The values in the organization unite this individual freedom with collectiveness and play a role in the orientation of a large organization in merging the objectives of departments and other subgroups in conformity with the objectives of organization as a whole. In the event that values cease to play a role, the bond to the organization disappears, and the organization is reduced to a crowd of disconnected people. Values guide the individual in knowing the acceptable behavior and the desired end–state in situations in which there is no one to ask. Those situations are commonly present in the innovation context; if innovation is the breaking of old barriers, which may be broken and which may not? Even though values seem like a loose way of steering an organization, values—deeply rooted beliefs—may, in conflict situations, become the implicit criterion for judgment in the end.

Values are not the only source of motivation and successful collaboration. Beyond values, a shared vision and mission, appreciation of productivity, group procedures to work, and cooperative behavior among individuals are all aspects that may predict effective collaboration and commitment to the organization (Tjosvold, Tsao, 1989).

It is common to state values explicitly in a statement about firm values. As values are seen as beliefs influencing and keeping the human behavior under, it seems unlikely that the values can be programmed; but they are clearly related to experience. Years of success, rewards, failures, and punishment become internalized in the minds of individuals in the organization. And when their values with reference to the organization are in question, values are a reflection of the collective experience. As values are visible in everyday action, the sharp–eyed person can spot them in

common statements like 'an empty warehouse space is always filled up'. Such a statement speaks to some value, as the tendency is a commonly experienced truth in the firm. For the executive of an innovative firm to understand the true nature of the organization and to overcome the difficulty of making innovations happen, the analysis of values being largely a part of the informal organization may be a rewarding process of creating new knowledge.

2.5.2.2 Company Culture

The commonly experienced truths of the organization associate the discussion of values with the broad field of *company culture*. Culture refers to 'general customs and beliefs of a particular group of people at a particular time' (Longman, 1995). The rationale for bringing culture into this discussion lies in the need to know the activity of informal and implicit behavior in the organization. Building on the argument (Aaltio–Marjosola, 1991) that today is a sum of past experiences, negotiations, decisions, and conventions, the culture serves a function of safeguarding the good beliefs, customs, and people, as well as limiting them.

The organization stores its memory of collective experiences in its culture (Aaltio–Marjosola, 1991). What is brought to mind is a perception of history as the self–evident and rarely questioned right. The culture is sometimes documented, but primarily present in the mutual understanding of everyone in the firm. When it is documented, as in a company history, it reflects only one interpretation among many of the details of the culture. More often than not, there are subcultures to the official culture. The culture is vital, as it relates to the self–respect of the collective as well as the individual (Brown, 1976). A common part of the culture is symbolism associated, for instance, with the founder or outstanding CEOs of the firm. They come to stand out as institutions, sometimes within a frozen set of values. Stories of their past heroism provide strong symbolic value to past events (Aaltio–Marjosola, 1991).

A strong company culture can be identified from personally and locally oriented cooperation networks, stable personnel situations, shared and mutually understood experiences that are either good or bad, trust between people, and a sense of importance of the purpose of the firm (Aaltio–Marjosola, 1991). In innovative firms, the culture supports further innovation, whereas a firm unable to be successful in its innovation is stuck if the culture does not change.

Trice and Beyer (1991) bring the discussion about company culture, leadership, and innovation into a hypothetical framework. They propose that such factors as vital personal qualities, perceived situation, mission, and vision (see Table 3) are vital elements that have consequences for the culture.

Elements of Cultural Leadership	Consequences for Culture	
	Innovation	Maintenance
1. Personal Qualities	Self-confidence Dominant Strong convictions Evangelist Dramatic/expressive	Confidence in group Facilitator Strong convictions Catalyst Persuasive
2. Perceived Situation	Crisis	No crisis, or a manageable one
3. Vision and Mission	Radical ideology	Conservative ideology
4. Follower Attributions	That leader has extraordinary qualities needed to deal with crisis	That leader represents existing values that were successful in past
5. Leader Behaviors	Effective role model Creates impression of success and competence Articulates ideology Communicates high expectations, confidence in followers Motivates	Effective role model Creates impression of success and competence Articulates ideology Communicates high expectations, confidence in followers Motivates
6. Performance	Repeated success in managing crisis	Continuation of success
7. Administrative Actions	New structures and strategies; or innovative changes in structure and strategies	Refurbish and strengthen existing structures and strategies; incremental changes in structure and strategies
8. Use of Cultural Forms	Communicates new cultural ideologies and values	Affirms and celebrates existing cultural ideologies and values
9. Use of Tradition	Establishes new traditions	Continues existing traditions

Table 3. Links Between Elements of Cultural Leadership and Consequences for Culture (Source: Trice and Beyer, 1991).

Just as the behavioral theory of the firm and the theory of innovation management address the stable versus the unstable state of the environment, this framework points at the links to maintaining a culture and an innovative culture. The hypothesis in this framework is that the leadership elements produce different cultures.

2.5.2.3 Identification with the Organization

In contrast to the values discussed here, which have a character of being correct behavior and choices from the perspective of organization, the attachment in terms of identification is characterized as personal. It is an emotional tie, in contrast to the rational organization. Presumably the personal decision being part of an organization means that personal identification takes precedence over accepting the values of the organization, and organizational values later dominate as the basis of choice and behavior. General statements like 'good for our company', 'it is in the interest of our department', or 'best for those who make change happen' illustrate an individual's identification with a company, or department, or inventors.

Identification refers to people associating with the values of a group in such a way that in making decisions, they evaluate options in terms of their consequences for that group. Again, this can be seen in contrast to a system of company values in which there is no elaboration of options. The company's specified values prescribe that there is only the 'best choice', the correct choice—only one possible decision. Identification builds either sentimental attachment to the objectives of the organization or conservation of the state of the organization.

A vital factor in identification is the success of the organization or specified group. Along with success and growth comes the potential of improved inducements like increased salary, career advancement, or an enlarged area of responsibility in combination with a larger budget, which could be rendered personal by the professional peer group. A Freudian interpretation of identification proposes that the common quality of identification lies in the nature of the tie with the leaders, addressing the fact that upper management plays a vital role in promoting mutual ties among members of the organization. The value lies, in particular, in the good environment for decision making, which follows from a well promoted identification.

Identification can also be counterproductive. In an area—say marketing—with which the individual identifies, that individual would be both

willing and able to decide according to the values of the organization. However, personal identification need to be attached to the firm as a whole, if identification is to be valuable for the cohesion of the organization acting for a particular purpose. Another dimension of the same problem occurs because organizations can have many goals, and when identification is based on shifting organizational goals, ambiguity can result. What is today's leading idea? What are the emerging new purposes of the firm? In particular, this aspect becomes a vital source of conflict for those acting in the domain of innovation in the firm.

2.5.2.4 Role of Authority

Authority exists only in the tie between two individuals, in contrast to values that affect every participant in the organization; and identification, which is the personal equivalent, may correspond to only a fraction of the whole. Authority here refers to the power of an individual derived from the individual's official position or based upon respect for the knowledge and experience of this person. It resides in the behavior of both the superior and the subordinate. Authority is commonly perceived as an attribute of the formal organization, which may, at a fist glance, appear to be a strange connection to the discussion about innovation. However, authority plays an essential part in coordination and particularly in the acceptance of decisions when the path chosen must cross the unknown.

Apart from the dimension of authority related to the formal organization, authority is also related to expertise, which makes authority a vital factor of innovation. Authority is understood here as the suggestions and persuasion of one person being accepted by another person without critical consideration. The right authority serves as a guarantee for the expert quality of decisions, the coordination and articulation of responsibilities that emanate from the decisions. Expertise and coordination supposedly lead to a state in which all members involved are part of the same decision, or, more specifically, part of mutually consistent decisions

with respect to the desired ends.

Why persons with authority are needed may be understood from their positive influence over decisions. A decision is always a conclusion reached on the grounds of both facts and personal values. When individuals make a decision through a coordinated effort, with the merit of their own criteria, they simultaneously make themselves dependent on the behavior of their peers in the cooperative group. An individual decision also partly incorporates the decision of another person who guides the individual's choice. The individual comes to accept those premises that form the grounds for the 'borrowed part' of the decision, without questioning those underlying premises. The borrowed part of the solution rests on authority, which has the power to guide the actions of others. The borrowed piece of the decision contains a transportation of and imperative statement of the choice—a command—of somebody else, and an expectation that the choice is based on solid criteria. The behavior pattern of the subordinate is to follow the advice—the option—selected by the superior.

It is argued (Simon, 1945) that authority occurs only momentarily. It is not to be expected that the subordinate recognize and follow all the commands of the superior, because individuals can choose to act on the basis of their own values. Those moments when two people play the roles of the superior and the subordinate builds on a mutual expectation of obedience. A subordinate obeying a superior must abdicate personal choice, unless the choice happens to be the same. Suggestion and persuasion may change the view of the criteria of the environment, which eventually may lead to choice, and possibly conviction. In this situation, authority may be absent, and the choice is made autonomously with greater consideration. The use of the unquestioned statement or command of an authority tends to be seen as inferior to suggestion and persuasion, which are argued to be a potential route to conviction of a permanent nature. A command, Simon argue, does not lead to that destination, as the criterion of choice of a command is in a 'black box'.

Conviction is a belief, relevant in a particular decision. What comprises the strength of conviction is the built–in perception of proof, despite the fact that proof may often be absent for the individual. It is like the unlikely situation that the patient would ask a doctor prescribing pain medicine for proof that it will cure a pain. Surely a doctor has both the recognition and the knowledge to be convincing to patients. The authority of the doctor relies partly on merit in making recommendations, but also on social position.

The usefulness of authority may be seen from the perspective of constraints on time and expertise. Individuals acting on recommendations take short cuts—and for good reasons when they take recommendations that they trust. If each detail of every decision were back–tracked, the search for truth would supersede the decision and the consequences where the recommendation is needed. On the flip side of this coin may be the explanation for resistance; in situations of resistance, opponents do not allow short cuts, and find merits for debating suggestions outside the line of duty and questioning the criteria of the suggestions. Such activity is probably most likely to occur in situations with too many employees with plenty of time on their hands who keep themselves occupied digging up details. Consequently, projects with too much time are not necessarily efficient, because of this preoccupation with debating details that would best be kept in the 'black box'.

Narrowly speaking, authority goes along the organizational hierarchy, defining who has the 'right to the last word'. The formal organization is a scheme of distribution of authority. On the other hand, authority may be accepted for the subordinate's convenience. Subordinates may be unwilling to accept responsibility, particularly for questions outside their area of competence and experience. Then it is opportune to avoid making own risky judgment and let the superior decide and take the responsibility.

The role behavior of a superior and subordinate does not always demonstrate behavior patterns of authority between the two. The area of

acceptance of the person as an authority is limited to the area of expertise. The formal hierarchy of authority may not secure the vast expertise required in individual decisions. Therefore, the authority may from time to time be found only in the networks of the informal organization, where the 'authority of ideas' is also found.

This discussion on authority corresponds to the question of who actually leads. 'The leader, or superior, is merely a bus driver whose passengers will leave him unless he takes them in the direction they wish to go' (Simon, 1945).

2.5.2.5 Willingness to Contribute (Capacity of Equilibrium)

Let us assume that, as noted previously, the majority of persons in the organization is passive in their cooperation outside the role of their formal position. Bernard argues (p.84, 1938), 'the preponderance of persons in a modern society always lies on the negative side with reference to organizations. Thus of the possible contributors only a small minority actually have a positive willingness'. In the case of large and comprehensive formal organizations like the nation or the church, most people are either indifferent or constructively opposed to any of them. Regardless of all the meeting being held in organizations that are bound to program employees to work together,, people are drawn to do their job—to fill the position that has been assigned. The surplus satisfaction of material and social benefits keeps the individual contributing to the organization. What sustains the efficiency of cooperation in the organization is the satisfaction coming from working for something and the achievement derived from its accomplishment. This phenomenon could be labeled 'the capacity of equilibrium', which expresses the balancing of burdens by satisfaction—the reason for continuation (Bernard, 1938). If participants lose their motivation and are no longer driven by the satisfaction of achievement, cooperation no longer justifies further participation, and the cooperation may be withdrawn. It may be assumed that the motivation will change over

time, as a consequence of interaction and experience. It follows, then, that when everything else remains the same, *ceteris paribus*, retardation actually occurs, even though things are as usual in the organization and in the level of cooperation. Conversely, the cooperation to stay effective requires continuous readjustment, where stimulating inducements and benefits are a means to the end, but also changes in parts of the environment as a whole. The ultimate test of cooperation is if or how effectively it accomplishes its common purpose, which is dynamic. Over time there is a need for readjustment with respect to the process of the changing environment, and processes related to creation and distribution of satisfaction among the participants. The function of the executive is to care about the effective adaptation of the process of will in order to accomplish, through individuals, the process and persistence of cooperation.

2.6 Organization Characters and Management Structures

The purpose of this section is to bring together the systems and characters of the organization, and to combine them with the managerial aspect of the organization. There are apparent elements in the systems and traits of the organization that are in conflict, or at least are not apparently beneficial for unstable conditions when innovations are born. This section, together with the following section on the actors of innovation, is intended to introduce the missing piece of knowledge. The aim is to establish a picture that offsets the mystique around the issue of why innovations happen. When the Part 2: Theories ends, the *behavior* of the firm, the *organization* of the firm, and the *management* of the firm will have been covered in anticipation of that which the empirical material will show as evidence.

2.6.1 Multiplicity of Systems

To begin, the formal management structure and the purpose–led official strategy form only one system among many prevalent in the organization of the firm. The system here refers to a set of connected items which operate together, a way of doing things, or a method excluding the personal and non–organization motives from the discussion, we can find polarities between at least the formal vs. the informal and the mechanistic vs. organic. Awareness of the characteristics of these paired systems may explain how the formal organization's repertoire, presented in previous sections as the theory of the firm of this book, can act dynamically in a changing environment. The extremes of complete discipline or complete absence of discipline are hardly the characteristics of a repetitively innovative firm. Rather, they are characterized by a proper combination of the two.

2.6.2 Formal vs. Informal Character of Organizations

The formal organization is defined (Bernard, 1938) as 'a system of conscious coordinated activities of forces of two or more persons'. For each known situation, there is a system or a practice for the organization and its members deal with it. Much of the organization is abstract, but the most common explicit personalization of the organization appears in the organization's diagram or organizational chart, which primarily describes the relationships among the various participants. The assumption is that existing knowledge and experience is consistent with the proposition of the organization diagram. Persons, statements, and premises often come to articulate and serve the definition of the formal organization. The formal organization is primarily a system of activities of human beings. Members contribute with transactions and control of things, through actions, thinking, words, looks, or gestures. The activity builds on reciprocity, which is an vital element for the cooperative character of the organization. The acts of the members of the formal organization are not personal, but

are determined by the system. Formal organizations are determined by 'orders as defined for a particular purpose'.

Strictly speaking, the cooperation of two or more persons can be called an organization. Most formal organizations are sub–systems within a larger organization system. So, whereas the smallest subunit of an organization may consist of 5 to 10 people, the subunits of larger organizations can comprise hundreds or even thousands of people. The organization of cooperation occurs when people are 1) able to communicate, 2) willing to contribute to the action, and 3) ready to accomplish a common purpose. Along with ability and willingness goes the requirement of belief in the purpose and good faith when things are not materializing and the effectiveness ceases. If people feel that their organization takes more than it gives, the state of cooperation efficiency is deteriorating and willingness goes down the drain. For the long–term survival of the cooperation, then, effectiveness and efficiency is required.

When a firm is being founded, it requires the proper combination of able and willing people who are motivated to work for the purpose of the organization. In the long run, it is the internal equilibrium of the organization that matters: the proper proportion of the three elements of the system, in natural coexistence with the prevailing situation in which the organization works. The external equilibrium deals, on one hand, with the relevance of the purpose to the situation in the environment in which the firm operates; and, on the other hand, the interchange between the organization and its members. When external factors change, it causes a chain reaction of change in the organization, leading to a change in the situation of its members.

It is argued (Bernard, 1938) that there is a large variation in the intensity of willingness across members of an organization. It is proposed that the preparedness among members to participate is generally negative or indifferent, whether in an existing or potential organization. Furthermore, it is assumed that only a small minority of the members

of modern society is willing to contribute. Furthermore, the degree of contribution is not constant. The conclusion is that 'the aggregate willingness of potential contributors to any formal cooperative system is unstable' (Bernard, 1938). The inducements and the options for individuals have an impact on their preparedness to contribute. The formal organization is dependent, therefore, on the motivation of the members and the compensation to satisfy them.

It is through communication that the potential interest of the member and the purpose of the collective become a dynamic process. Verbal communication is the common means of communication. The method of communication centers on oral and written language. Motions or actions that are of obvious meaning also carry meaning, without any deliberate attempt to communicate. *Observational feeling* is another important aspect of communication, which is necessary because of the limitations of language and differences in the participants' capacity for language. As Bernard (1938) has noted, 'An element in special experience and in continuity of individual association is the ability to understand without words, not merely the situation or conditions, but the *intention*'.

Simple or complex formal organizations are always an impersonal system of coordinated human efforts; there is always a purpose as the coordinating and unifying principle; always there is the indispensable ability to communicate; always the necessity for personal willingness, and for effectiveness (of cooperation) and efficiency (producing results) in maintaining the integrity of purpose and the continuity of contribution (Bernard, 1938). Only the balance between the elements differs in a complex vs. a simple organization. The limitation for both the simple and complex organizational structure lies in the necessity for all parties in the organization to be able to communicate.

Few members can see the true situation in an organization or have the ability to communicate or govern a specific action across the organization. The exception—top management—has the *possibility* of making these

things happen. Nevertheless, the limitations of top managers are scarcity of time and capacity to communicate if there is a wide physical spread among members of the organization. It is inescapable that the purpose must be communicated and translated into action—what to do and when—which has the effect of generating the desired outcome. An awareness of the conditions of the environment must go hand in hand with the communication and with the purpose and actions. The limitations of leadership and organizational structure depend on the 1) the complexity of the purpose and the technological situation, 2) the communication difficulties incurred in conveying the message, 3) how widely the message needs to be spread, and 4) the complexity of the social conditions involved in the personal relationships of those involved.

The organization consists of several sub–units, which means that it must take the shape of a pyramid in order for the organization as a whole to be managed. From the complexity of large firms follows specialization of the executive function. A vital aspect of the organization structure is determined by the requirements of communication (Bernard, 1938).

In conjunction to the coordinated formal organization, there exists a less coordinated (by the official management) interaction among people in the firm. The *informal organization* is needed, and is an integral part of the formal organization. Just as in the case of a formal organization structure, the common denominator is communication. Unlike the formal impersonal organization ruled by an authority, however, personal attitude and choice are the rulers of the informal organization. Whereas joint purpose unites the formal organization, that particular conscious purpose is not present in the informal organization. The informal organization is not governed like the formal. By definition (Bernard, 1938), the informal organization is 'the aggregate of the personal contacts and interactions and the associated groupings of people'.

Even though the nature of informal organizations appears to be tacit, those formations are in the domain of conscious processes. Their

tacit character goes with the argument that major executives are often unaware of widespread influences and agitations within their organizations. The informal organization has the effect of creating and strengthening attitudes, understandings, habits, and institutions, which are all a foundation upon which the formal organization can grow. The evidence of the informal organization can be traced in the interactions of the formal organization.

The personal character of the organization is not necessarily in conflict with the formal organization, although it may, of course, be hostile to formal authority. The informal organization introduces a needed element of *feeling* personal integrity and self–respect, however, and may therefore have the function of unifying the formal organization. Moreover, it is assumed that the informal organization needs the formal organization in order to survive. In the absence of the formal organization, the state would be complete individualism. In the absence of the formal organization, it would resemble the ceremonial exercising of an army.

One aspect of the informal organization is dependence on the need for action—the need to do something. Activity may even supersede the importance of achieving a particular goal of the informal organization. The action is assumed necessary for the satisfaction of the participants, for keeping them together as a group. Dialogue can be an example of such action. The activity occurs within local and immediate close groups, and the group makes individual behavior different than it would be if the individual were not in that social situation. Thus, on the one hand, it difficult to forecast the ends of the group and the individuals within it; whereas, on the other hand, this may be why groups can produce positive and surprising ends. The social nature of the informal organization limits how distanced an action may be. In general, it is argued that 'social activities cannot be action at a distance' (Bernard, 1938).

The formation of the informal organization is less definite than that of the formal organization, and its structures do not resemble those of

a formal organization. The density of the population in the informal organization may stem from factors of closeness. People may sit in geographical proximity, for example, for some purpose that brings them together for a mutual and conscious achievement within the formal organization. In line with this, Bernard argues, the informal comes before the rise of the formal organization. The common purpose of the formal organization requires preliminary dialogue prior to the formal purpose of the organization. Further down the road, when the formal organization has been established, it makes explicit those states of mind and institutions that are created by the informal organization.

Table 4 describes the differing characteristics of formal and informal organizations, presented as a summary of Bernard's view of organizations, the Cyert & March view of the firm, and selected theories from Part 2: Theories.

Formal	Informal
Bernard (1938) 'the organization': A system of consciously coordinated activities or forces of two or more persons One unifying joint purpose Impersonal system of coordinated human efforts Purpose driven by the same organizational and individual motivation. Accomplishments of the organization itself are a source of personal satisfaction. Hierarchical and pyramid structure of communication Failure trigger the decision making process in adopting new purposes. Necessity for personal willingness and ability to communicate Life depends on its ability to secure and maintain personal contribution of energy necessary for its purposes.	**Bernard (1938) 'the organization':** Aggregate of personal contacts and interactions and the associated groupings Local immediate contact groups Chains of interaction between individuals change the experience, knowledge, attitudes, and emotions of individuals affected. Without any one joint purpose Certain attitudes commonly held Need of action, to do something, a primary propensity and necessary for social satisfaction Satisfaction of mere association Are connected to all over the formal organization. Create conditions under which formal organizations may arise
Cyert & March (1963) 'the firm': Everything subordinated to rational profit–seeking and output what the firm delivers Generic goals, production, inventory, sales, market share and profit Information processing and bargaining Budget as a control and allocation system Standard operating rules Procedures of choice avoid uncertainty maintain rules and use of simple rules. Specific standard operating procedures: task performance rules, continuous recording and reporting, information–handling rules, plans and planning rules Organizational specialization, line of command and span of control	**Other:** Values, company culture, authorities of knowledge, identification

Table 4. Characteristics of the Formal vs. Informal Organizations (Source: own adaptation of Bernard, 1938; Cyert and March, 1963; Part 2: Theories).

2.6.3 Mechanistic and Organic Systems of Management

There is an alternative approach to understanding the organization from a managerial systems view, as found in the innovation literature (Burns, Stalker, 1963); it features the 'mechanistic' versus the 'organic'

management systems. The formal vs. informal organization and the mechanistic vs. organic are reflections of two different states of the firm. Both mirror the stable or unstable conditions under which the firm operates. Both the formal organization and the mechanistic system portray the firm as a machine–like creature. The mechanistic organization has characteristics that are similar to the normative behaviors described in the theory of the firm. The main difference in view is that the former focuses on the collective patterns of intra–organizational collaboration, whereas the latter focuses on two systems that influence the collaboration. As the people and organizational activity is a common point of departure, there is an apparent congruence between the concepts of formal vs. informal and mechanistic vs. organic. The organic view, however, extends the knowledge of the informal organization, in a way that sheds light on the conditions of innovation in a firm.

The management system, like the organization, is a dependent variable of the prevailing conditions of the firm. It may be argued, however, that because the firm sometimes has the power to change market conditions and trends in technology, its dependence is debatable. The power of independence from the general assumption lies in two factors: 1) the relative strength of participants' commitment to political and status–gaining ends, and 2) the relative leadership capacity—to interpret the requirements of the environment and committing individuals to the purposes of the organization—of those in major positions in the top hierarchy (Burns, Stalker, 1963). There is, as such, no stereotype of ideal management; rather management is consistent with the rate of change in the market, and consequently, in the organization.

Table 5 lists the characteristics of management under stable conditions when the mechanistic model is appropriate, and the management system under changing conditions, when the organic management system fits the purpose. Under changing conditions, the solutions to problems are unforeseen, and even the problem may not yet be found. These two arrangements are divided into two inseparable things in the firm. They are

to be seen as a polarity, with stages of aptitude of the organization between the two extremes, yet firms may operate with management systems that include both sets of characteristics shown in Table 5.

Mechanistic	Organic
Specialization of functional tasks	Contributive nature of special knowledge and experience to the general task of the firm
Technical improvement of means, rather than the accomplishment of ends of the firm	'Realistic' individual task, seen as part of the situation of the firm
Reconciliation of performance by the immediate superior at each level	Continuous redefinition and adjustment of individual through dialogue with others
Definition of rights, obligations, and technical methods to each role	Loose definition of responsibility as a field of rights, obligations, and methods
Hierarchical structure of control, authority, and communication	Spread of commitment to the firm, beyond the technical definition
Location of knowledge exclusively at the top	Network structure of control, authority, and communication. Sanctioned by the community, less the superior.
Interaction between members vertical, i.e. between superior and subordinate	Knowledge of technical and commercial located anywhere in the network, becoming the ad hoc centre of control authority and communication
Instructions and decisions issued by superiors	Lateral communication between people disregarding rank, resembling more consultation than command
Insistence on loyalty to the firm and obedience to superior condition of membership	Content of communication: more advice and information, rather than instructions and decisions
Importance and prestige attached to general knowledge, experience, and skill	Commitment to the task of the firm, material progress. and expansion more valued than loyalty and obedience
	Importance and prestige to affiliation and expertise in the industrial, technical, and commercial milieu outside the firm

Table 5. Mechanical vs. Organic Systems of Management
(Source: own illustration, with reference to Burns and Stalker, 1963).

The innovation management theory assumes that both the mechanistic and organic organization systems are rational by nature. In both states, the firm is striving for the most efficient management system feasible. If organic measures are applied under stable conditions, an impression of irrationality comes deceptively into the discussion. The argument of rationality holds when the change in conditions changes the criteria of rationality accordingly.

Neither the mechanistic nor the organic systems lacks authorities; the difference is that in the mechanistic and formal organization, the authority is built on rank or position in the formal organization hierarchy, whereas the hierarchy of organic organization is built upon seniority of knowledge—upon those most capable of making decisions. It follows, therefore, that the locus of authority may be spread out in the organic organization and determined by a consensus of the participants involved.

The character of the organic system builds largely on extensive commitment, beyond the narrowly defined tasks in a mechanic organization. Combined with the assumption of reduced importance of positional hierarchy, the individual acts upon personal initiative, without clear instructions, when situations are presented for the first time. Thus the importance of shared beliefs of destinations and of values of the firm is elevated; what is right and what is wrong in this first–time situation gains importance. This turns the concerns of leadership toward work, building an institutionalized form of values, beliefs, and conduct through exemplary manners and commitments, accumulating what represents the good in the firm. In terms of responsibility, the organic system is more demanding for the individual, as judgment often descends from the responsibility of upper manager to the lower–level manager.

When the organic form of management provides less clarity and familiarity in the various settings of the working organization, it leads to uneasy sentiments and anxious seeking for answers about what the managers should be doing. The confusion may lead to resentment when the 'not–explained' invades minds in the organization. The response is needed in order for the organic organization to do its work—or to revert to stagnation through mechanistic responses to change.

During times of drastic change and during the early days of a firm, the situation is similar. Deliberate action must be taken on everything, conditioned by the new situation and absence of structure for day–to–day decisions—a likely condition for stress (Bernard, 1938). Under stable

conditions, often a characteristic of mature firms, the elaboration of ends is much more constrained by the same structure that is lacking in a changing situation, partly because past decisions and commitments are silently present today. They may be more or less formally stored and be removed from consciousness, yet they are effective without being subject to renegotiation. Individuals tend to be strongly motivated to accept past decisions as binding proxy. It may not be the structure itself that is the impediment, but the inability of managers to see the structure and its effects. This tendency can be seen, for example, in the planning and budgeting activity of the firm; past budgets create the precedent for future budgets, past allocations of funds follow the same pattern as they did last year. In exceptional cases, the budget is renegotiated from an empty table. Theoretically at least, the budget contains the sum of all activities left to be dealt with outside the coordinated domain of the organization, or activities requiring resources in the firm, including items that are not addressed in strategic planning, but are in the category of general sayings 'the way we have always done it'. As long as achievements continue to be on satisfactory level, 'same procedure as last year' tends to apply. And the budget is only the tip of the iceberg; there are probably other similar instances of the experienced pattern that strangle the emergence of innovation.

2.7 Actors of Innovation

The human impact has, up to this point in the book, been allotted a minor role; yet research points to the individual as a central explanation for the occurrence of innovation. This long detour has been necessary and relevant nonetheless, considering the purpose of this thesis: to answer the question of how innovation is led in mature consumer product companies. Before describing the specific roles of the actors, the next sub–section offers a shallow description of the individual perspective of those who come to the table of innovation.

2.7.1 People at the Top of Organic Systems

Figure 22 illustrates a key question: Why do some people go willingly into the windy unknown, while others are seeking shelter? The easy answer may be that those who do not, do not care and do not dare. There is a high probability of failure. If the success rate of innovations is, say, 20%, there must be at least five wholehearted attempts in order for one to succeed. The journey without the big reward and glory may take years, even decades. Not too encouraging!

Figure 22. Wind Shelter.

By looking at the positive forces, we may assume that the corporate activists[8] of innovation are, to some extent, the same type as entrepreneurs. If that is the case, it may be meaningful to take a brief look at *the why* of entrepreneurs (Shane, 2003). To begin, the choice to cross the field of the unknown is a conscious decision, and the determination grounded on self–efficacy—like beliefs in one's own capabilities to achieve the ends of activism. Such people seem to have a different attitude toward risk; those who see it from the outside label risk as risk, whereas an entrepreneur is biased toward the opportunities and rewards lost through passivity. Alternatively, the explanation may lie in the mental processes of acquiring, storing, using, and transforming information. From the assumption that the motivation of activists is high, given their deliberate decision to engage in activism, flows an assumption of increased alertness for impulses of opportunities. While others sleep, the radar of the innovator is on.

It has been debated whether or not entrepreneurs have a different 'big picture'—or schema or mental framework—in their minds, or how it is that they come to perceive things differently. When social movements occur and the big picture changes, it may be the trigger of events that translates into opportunities on the radar screen of the entrepreneur. When the sign of the opportunity meets individual perception, a unique conclusion of a business model could follow. Or perhaps it is the entrepreneur's aptitude for contra–factual thinking—the creativity of imagining alternative outcomes of a past situation—that sets the entrepreneur apart. If productive, this type of thinking leads the entrepreneur to reconsider past events from a new perspective, resetting and recreating new strategies that would lead to more successful ends. In summary, it is assumed here that the attitude of entrepreneurs resembles the attitudes of activists of innovation in these ways.

Besides the decision to be an activist in this field, and the self–

8 Someone who works hard to achieve a social or a political change; activism (Longman Dictionary), activism refers to the use of direct and noticeable action to achieve a result, usually a political or social one (Cambridge Dictionary)

efficiency to manage it, the successful activists of innovation also possess a vital force in their prior knowledge (Shane, 2000). This suggestion highlights the fact that the discovery of opportunities *relates to information that that the entrepreneur already possesses.* The stock of information is different for different people, as it has been generated through different life experiences; it is called information asymmetry. Hence, different entrepreneurs will perceive equal opportunities differently. The theory (Hayek, 1945) of entrepreneurship assumes that markets are composed of people who possess different information, which is why all people cannot recognize all opportunities. It is suggested that opportunities are discovered, not because of some special personal characteristic of the entrepreneur, but because idiosyncratic prior knowledge makes some people better than others at discovering certain opportunities.

It is argued in the general theory of entrepreneurship (Shane, 2003) that entrepreneurial opportunities are not obvious and that the discovery takes place through recognition, rather than through a search with a known outcome. It has been argued (Shaver, Scott, 1991) that opportunities are discovered because of people's superior information–processing capability and behavior to *search* for opportunities. On another hand, it has been suggested that the individual discovers opportunities through recognition of *the value of new information*, achieved by means other than search. The conceptual model of prior knowledge is illustrated in Figure 23.

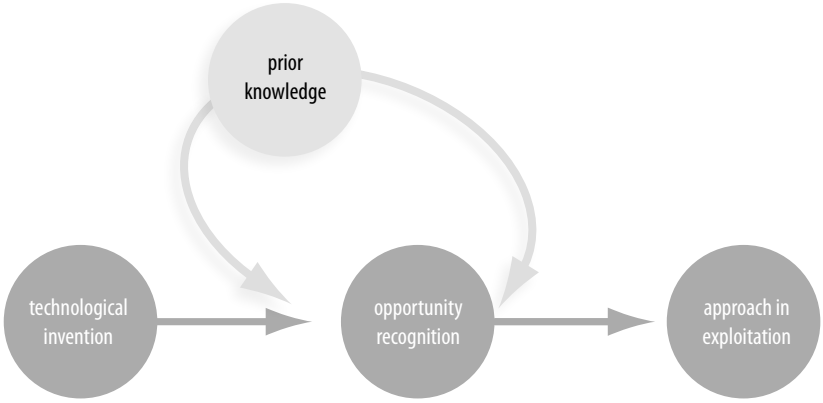

Figure 23. Prior Knowledge and Discovery of Entrepreneurial Opportunities (Source: Shane, 2000).

Each person's 'corridor of knowledge' (Shane 2000) allows that person to recognize only certain opportunities. Aspects like education, work experience, and patents are examples of prior information influencing the ability to grasp and apply new information. Shane points out particularly essential domains of prior knowledge: *prior knowledge of markets*, *prior knowledge of ways to serve the market*, and *prior knowledge of the customer problems*.

As noted previously, the information needed for market transactions is generally incomplete (Kirzner, 1973), which is why success or failure of recognizing opportunities is also partially related to guesses about each other's beliefs. Furthermore, as Nelson and Winter (1982) have noted, the process of how information is randomly distributed suggests why luck partially explains why some people have information and some do not. Consequently, only certain people will—in a specific situation and at a specific time—know about the needs of particular customers and market opportunities for certain products (Venkataraman, 1997).

2.7.2 Activists of Innovation

The mechanistic system is argued (Burns, Stalker, 1963) to be the dominant mode system of management in mature industrial firms. That statement is supported by the suggestion that there is a latent urge for stability, which is why the organization reverts to the mechanistic mode of management. If the rate of technical and market change rules the adoption of the firm, then the strength of personal commitment and the abilities of the chief executive to interpret the technical and commercial situation and to mobilize the system will decide if it swings from mechanistic to organic in order to deal with changing conditions.

Indisputably, the role of the managing director has a given role in the constellation of any firm. Although the strength of that role is not given, both the formal and informal forces of the organization are attached to the powers of this role. The values of the top executive are a significant predictor of innovation success, yet the role is overshadowed by the 'values of the elite' (Hage, Dewar, 1973) or inner circle—an issue that is raised later in this book. The CEO is the person who must ultimately make a judgment about a situation, the organizational structure needed, and commitment of competencies and resources, in concert with the purpose of the firm, and for everyone in the firm. At the end of the day, the managing director is accountable to the owners of the firm for the creation and evolution of the purpose of the firm and for setting the goals. Considering the complexity of the organization and knowledge needed, it is apparent that those who are in a coalition with the managing director come to play an essential role in innovation. The use of the term *management team* has deliberately been avoided here, as that grouping does not necessarily refer to the activists of innovation. Why not? There are merits in assuming that innovation occurs largely under conditions of the organic system of management, and to some extent under the informal domain of the organization. The former theory particularly emphasizes the authority of

know–how and how it is probably stratified in the organization.

It appears that only a minority of the population has the propensity to capture emerging opportunities that lead to innovation (Gladwell, 2002). As mentioned previously, those who are 'willing to contribute' (March, Simon, 1953)—to work with the unknown—are relatively few. The arguments presented to explain their hesitation were fear of failure, penalties, and career limitations, as well as loss of authority. The coalition that constitutes the activists of innovation can be brought to light by describing the characteristics of the entrepreneur, the champion, or the promotors of innovation. As the current team of activists is the result of a historical evolution of how innovative resources have been organized in the firm, the next section outlines a brief description of the three theoretical concepts and a proposal of the evolution of this network.

2.7.2.1 The Entrepreneur and the Champions of Innovations

An entrepreneur is, as defined earlier in the Introduction as a'someone who perceives an opportunity and creates an organization to pursue it' (Bygrave, Hofer, 1991), and someone 'pursuing opportunities without regard to the resources they currently control' (Stevenson, Jarillo, 1990). An alternative description of the entrepreneur is picturing a person who is involved in the discovery, evaluation and exploitation of opportunities to introduce new goods and services, ways of organizing, markets, processes, and new raw materials through organizing efforts that had not existed before (Shane, 2003, Venkataraman 1997, Shane, Venkataraman 2000).

As the firm grows, the network within the firm built by the entrepreneur also evolves (see Figure 24). As the organization grows or the business becomes more diverse, the network of actors becomes fragmented. No longer does the business definition rely on one individual, but definitions begin to follow the lines of administrative functions, hierarchies, or markets. Simultaneously, the business tends to readjust more slowly, or an air of indifference emerges toward discontinuances that form new market opportunities.

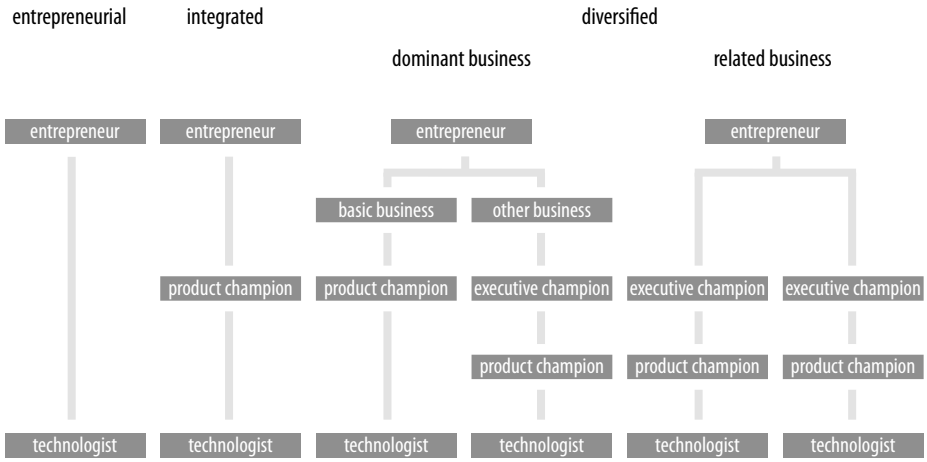

Figure 24. Evolution of the Entrepreneurial Network (Source: Maidique, 1980).

The firm's evolution brings along a new role—that of a champion—in the mature entrepreneurial setting, consisting of the entrepreneur and an engineer. The *Champion* was defined by Schon (1963) as 'a man willing to put himself on the line for an idea of doubtful success. He is willing to fail, but he is capable of using any and every means of informal sales and pressure in order to succeed'. This actor, who has certain similarities to the entrepreneur, tends to be dubious, even indifferent to the organization of the firm. The Champion is willing and able to take the risk of failure, and enjoys both recognition and a position in the firm. Like the entrepreneur, the informal organization is in parallel use with the formal, and the Champion knows how to use the informal relationships. The role is, by default, a controversial one to play, as it may be seen as disrupting the ongoing structures of the firm. The statement of Schon (1963) that the Champion is not commonly coming from the outside of the firm, in combination with the statement that these personalities are scarce, may explain the difficulty of a non–innovative organization aspiring to be innovative.

The champion concept has varying attributes, and different champions are labeled product champion, management champion, technical champion, or executive champion (Maidique, 1980). The roles are primarily positioned as sponsorship roles, with the exception of the technical champion, who is also active in the technical field.

2.7.2.2 The Promotors of Innovation

The promotors of innovations represent an alterative view compared to that of the champion; they occupy the role of those who come to exercise their power and influence in order to eliminate obstacles to the firm's innovation process. Promotors are people who actively and intensively support an innovation; they start the innovation process, sustain a high activity level, and terminate the decision process. They have similar characteristics to the champion. The theory of promotors builds on the assumption of resistance and extraordinary measures undertaken for the sake of the innovation. In addition to indifference, the prime barriers are not wanting and not knowing. The promotor may be a single actor in the innovation context, but there are also formations of a dyad of promotors and a troika of promotors. The promotor is necessarily on the top of the formal hierarchy, but on top of the informal hierarchy in a particular area of influence—hence the assumption of a particular division of labor is fundamental. The basic model builds on three types of promotors (see Table 6): *power promotors,* who overcome barriers of unwillingness through their hierarchical positions; *expert promotors,* who overcome lack of capability through their expert knowledge; and *process promotors,* who are the godfathers of the process of delivering the innovation (Hauschildt and Kirchmann, 2001). The model has been further extended with the addition of a *relationship promotor* (Gemünden, 1995), who is influential in the complexities related to intra–firm matters and willingness to cooperate in this interaction. As may be assumed, in the development of technology–related innovations, the technical promotor is at the heart of the coming

of an innovation. Table 6 summarizes the profiles of the four various promotor roles.

Power Promotor	Technical Promotor	Process Promotor	Relationship Promotor
– Has access to material resources – Acts as an investor – Legitimizes projects – Influences personnel decisions – Blocks opposition – Protects promotors with know–how – Influences priorities and schedules	– Knows critical details – Develops options – Evaluates external solution proposals – Implements concepts – Tests prototypes – Solves problems	– Has hierarchical influence – Knows processes, rules, values – Has social competence and good internal networks – Searches for and promotes people with ideas and initiative – Gives contacts to senior management – Plans, controls, moderates change processes, supports flow of information – Builds trust, solves conflicts, supports common goals within the firm	– Has cooperation experience, good network position, and good network knowledge – Has social competence, and good external networks – Finds adequate cooperation partners – Plans, controls, moderates exchange processes, supports flow of information – Builds trust, solves conflicts, supports common goals between firms

Table 6. Power Sources and Contribution of Promotors
(Source: adaptation, with reference to presentation of Gemünden H.G.).

The promotor of know–how is also called the technology promotor, expert promotor, promotor by technological know–how, or even the inventor (Hauschildt et al., 2001). The process promotor may also appear as a project champion, or promotor by organizational know–how. The power promotor is synonymous with the promotor by hierarchical power, sponsor, and innovator.

Promotors are united by a shared enthusiasm and language for a new idea. The patterns of informal behavior, organic management systems, and teamwork apply particularly to this mode of work. There are examples of several persons playing a particular role, which results in the number of people exceeding the number of promotors described here. Innovation teams may well comprise five to seven members (Bantel, Jackson, 1989). On the other extreme, there may be no promotors involved. The most

usual scenario involves a technology know–how promotor, and the bond between the power promotor and technical promotors has proven to be a strong force in the success of innovations (Hauschildt and Kirchmann, 2001), as illustrated in Figure 25.

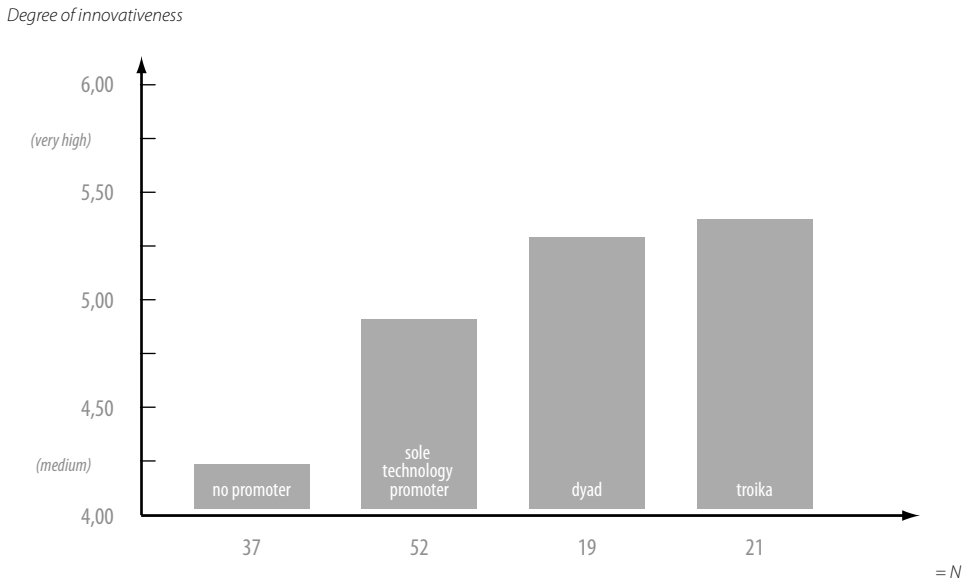

Figure 25. Definition and Distribution of Promotor Structures (Source: Hauschildt and Kirchmann, 2001).

The studies indicate that an increase in adequate promotor resources increases the organization's capability for spectacular innovations. It may be that the solo work of a technological promotor is more creative, and becomes even more creative in the presence of a power promotor—in overcoming hurdles of will in the organization, for instance. When the process promotor in also engaged, further organizational barriers may be removed. These findings are illustrated in Table 7.

Promoter structure	Description	Frequency of occurence	
		N	%
No promoters	No promoters are involved in the innovation process	37	(28%)
Sole technology promoters	One or more technology promoters only are involved in the innovation process	52	(39%)
Sole power promoter	One or more power promoters only are involved in the innovation process	0	(0%)
Double role	One or more promoters are involved in the innovation process, all of whom combine the characteristics of technology and power promoters	4	(3%)
Dyad	One or more technology power promoters and technology promoters are involved in the innovation process	19	(14%)
Troika	One or more of each of the power, process and technology promoter are involved in the innovation process	21	(16%)
		N=133	100%

Table 7. Promotor Structures and Degree of Innovativeness (Source: Hauschildt and Kirchmann, 2001).

The Hauschildt and Kirchmann study proposes a similar pattern of dependency; an increase of adequate promotor resources increases the success of technical and financial considerations. The fact that this study revealed a significantly lower impact of financial success than technological success may be interpreted to mean that even though the product was technically excellent, it was not equally successful in the market; or it was overly costly to be profitable. That finding is illustrated in Figure 26.

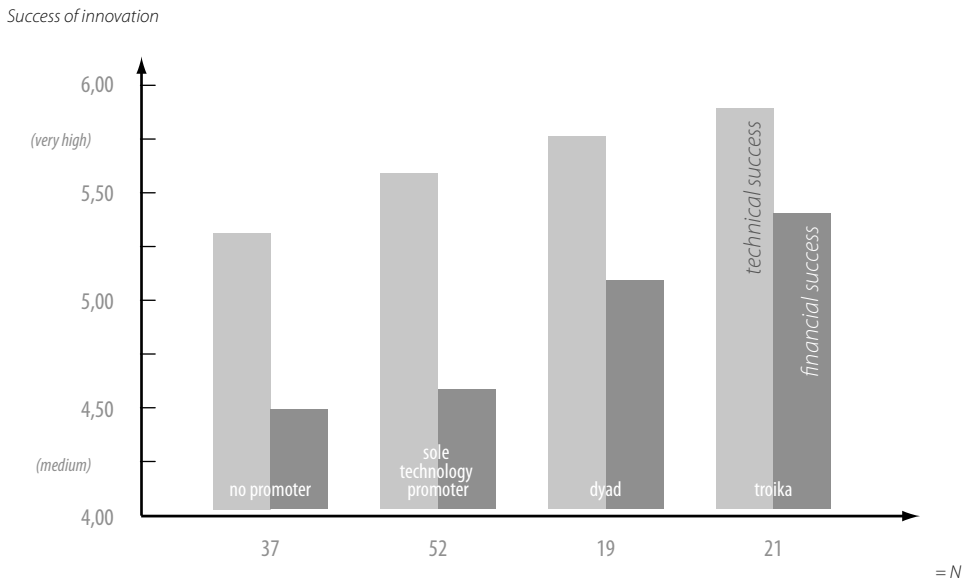

Figure 26. Success of Innovation and Promotors (Source: Hauschildt and Kirchmann, 2001).

To conclude, both the theory of promotors and the theory of champions point to actors within the organization who are vital for their capability to deliver substantial innovations. Clearly, these few individuals do not act alone, but play an integral role in their relationship with the rest of the organization. As will be seen in the empirical material, there are numerous names mentioned in the stories of innovation, but the making of innovations appears to correspond to the law of the few (Gladwell, 2002). A few people make a big difference, and others follow.

The contribution and participation of the promotors and champions is dynamic over time. Folkerts's (2001) study of the promotors in the cycle of an innovation demonstrates that role structure is dynamic. A person may adopt and migrate into another promotor role in different phases of an innovation cycle, different individuals may play the same role during different phases of the innovation cycle, but a person may also remain in a particular promotor role throughout the entire course of an innovation.

Table 8 illustrates the role dynamics in a particular innovation case.

Case	Person	Phase		
		Concept	Development	Implementation
New material concept	Homfeldt	M		
	Habeck		M	
	Jessen	P	P	
	Kilian		P	P
			PF	
	Schubert	F		F

Table 8. Dynamics of Promotor Roles
(Source: dissertation of L. Folkerts, 2001).

In the conceptualization phase, three persons were defined as promotors: Homfeldt as a power promotor (M), Jessen as process promotor (P) and Schubert as promotor by know–how (F). None of the individuals were active in all three phases; the power promotor role first held by Homfedt was later assumed by Habeck, and in the implementation phase no one played the role of a power promotor. Maidique (1980) also argues that the 'process is fluid' and suggests another set of key roles distributed along different stages of an innovation process. Figure 27 illustrates the roles of the various champions at various stages of the innovation process.

Figure 27. Roles and Stages of Innovation (Source: Maidique, 1980).

The point here is not to argue for a particular pattern of influence, but to underline that there are different interpretations of the key roles of innovation which are related, and that there is agreement that the structure of key roles is dynamic.

Summary

Part 2: Theories has introduced numerous aspects related to the research question and the empirical observations in this study. Besides the attempt to match the selection of theory to correspond with the research questions and the empirical observations, the emphasis has been broad also, to forecast the area of key findings and to provide tools needed for

interpreting the results. The phenomenon of innovation studied has been described at the outset of the Part 2: Theories. As the firm deals with innovation, the new disrupt the past understanding the operating environment, the reason for being and the past structures of the firm. As a response to this assumption, theoretical conceptions of seeing and redefining the new environment and situation, and the implications on the purpose of the firm and the strategy were brought up in the review. The review further built on the assumption that the organization and management structure follows as a consequence of and a synthesis from these general conceptions of the firm's environment and the purpose of the firm. This assumption is based on Bernard's (1938) organization theory that the event that the purpose of the organization has been defined and stabilized, the purpose refers more specifically, not to the discussion about external rulers, but to internal domains of discussion and organization theory. Reasoning further that leadership in a mature firm both deals with foreseeable routine operating matters and unanticipated matters related to innovation, motivated to draw the attention to the formal and informal dimensions of the organization and to the mechanistic and organic systems of firm management. The review recognizes in the end the role of particular activists, which both is found in earlier research to be a central explanation for innovation and which anticipates the results in of this research. The general character of the theory in the literature review reflects the general nature of the firm's leadership aspect, which is also the scope of this research question.

The theoretical and empirical knowledge is connected in three phases of this book. First, an initial and general connection is made in the summaries of each subsection in Part 4: Empirical Observations. Second, the theory is connected to empirical knowledge in Part 5: Analysis, where each case story is analyzed separately. Third, the analysis presents a synthesis of the theories that are vital for providing explanations in this study, the leadership differences between successful and unsuccessful mature firms at the end of Part 5: Analysis. In those later sections, further

reference is made back to this Part 2: Theories and will not be described again in the end. The following Part 3: Research Methodology, describes how the most relevant matters connecting to the research question have been extracted from the large set of empirical data and theories presented.

PART 3: RESEARCH STRATEGY AND METHODOLOGY

Part 3: Research Methodology illustrates how the empirical material is processed, in order to address the major research questions. Following, in Part 4: Empirical Observations, empirical findings are presented as a function of the way the data were treated. This research focuses on mid–sized, established, innovating firms. The innovation discourse is specifically pursued from the angle of *leadership of innovation in mature firms.* As mentioned in the Part 1: Field of Research, the main research question and four sub–questions are:

How is innovation led in mature consumer–product firms?

- Which areas of attention help to maintain a state of innovativeness and the cycle of innovation?
- What are the dependencies and the dynamic between these areas of attention?
- How can the leadership system/mindset in an innovative mature firm be characterized?
- What is the difference in leadership between innovative and non–innovative firms?

3.1 Philosophic Aspects of the Research Method

This research focus on unknown fields of innovation leadership. The analysis of past research on product development indicated a shallow understanding of the effects of senior management on development (Brown, Eisenhardt, 1995). There appeared to be no well framed starting point that would justify a quantitative approach; therefore, a qualitative method was chosen as a sensible way of exploring the field of innovation leadership.

Grounded theory was used here to analyze the empirical data because it fit the purpose of this research for a number of reasons. It builds on the social usefulness of the search for truth. The theory focuses more on theory generation than on theory validation. Above all, individual cases are studied before a big number of cases, and the evidence refers from unique incidents. Grounded theory is primarily a qualitative research method—a characteristic that stresses its explorative nature. The theory is sensitizing, giving the experience of a particular matter or situation, so that one can note and understand new relationships, new perspectives, and a new conception of the world. In grounded theory, the social act is in focus; and grounded theory is based on the assumption of closeness to the empirical everyday life (Alvesson, Sköldberg, 1994). The particular implication of the closeness to the everyday life in this research will be seen in the descriptions in the Part 4: Empirical Observations and Part 2: Analysis later in this book.

It follows from this argument that the model of interpretation is primarily inductive in grounded theory. This general claim is based on the dependency of a number of individual cases, and on the assumption that general patterns can be derived from a limited number of cases. The aim, therefore, is to find merits for deriving universal patterns across the selected sample firms (Alvesson, Sköldberg 1994).

The empirical material consisted of 29 hours of uninterrupted discussions about leadership in innovative firms. The resulting document transcribed from the tape recordings comprised 508 pages yielding 230,000 words. Thus the exercise resembled the act of 'an crime investigator solving the puzzle' (Alasuutari, 1999). The challenge was to weed out the essential elements relating to the overarching research question: How is innovation led in mature consumer product firms?

3.2 Prior Knowledge

As one would assume, my knowledge and experience have influenced my judgment about the relevance of the literature and its selection. My background includes some 15 years in business in board memberships and several senior management positions. I have practical experience in general company management, marketing management, product development, organizational development, and innovation projects. In these roles, I have initiated and managed the popularization of a mineral water, a beverage logistics solution, a mobile payment concept for vending machines, and a concept for a yacht.

3.3 Implementation Outline

This dissertation research and the subsequent book grew from an extensive literature review and prior research in the field of innovation management. As shown in Figure 28, the specific purpose of this research emerged from a combination of the literature study and a curiosity about empirical practice. The literature study led to the methodological approach eventually selected, which, in turn, had implications for the empirical choices. The circle closed when the data were analyzed and compared with theoretical references. It has been an iterative process. Increased understanding has shaped the purpose of this work, which has had an impact on the choice of theory and the sample.

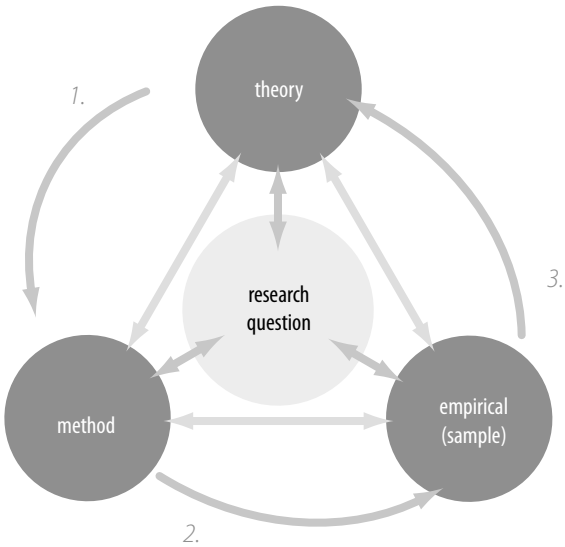

Figure 28. Iterative Way to Work.

3.4 Empirical Sample

The empirical observations were collected through personal interviews with 3 to 5 persons in 6 firms, each lasting between 60 and 90 minutes: a total of 24 individual interviews, resulting in some 30 hours of recorded material. I conducted personally all the interviews.

The empirical sample—the firms—was derived from a sector of "grand old" brand and/or design–oriented firms. As serial innovators, these firms were easy to identify, as they needed to expose themselves publicly on an ongoing basis in order to maintain the vigor of their businesses. A sub–criterion for selection was that the firm be financially sound, indicating that its business model worked.

The public statements, annual reports, and web pages of the firms were leading sources of appropriate firms for the research. Firm innovativeness was identified by examining how the firm pictured its *historical product time line*—as subsequent *product generations or other inventions* from previous years.

The following firms were engaged: Player Company (playground equipment), Plumber Company (faucets), Adventurer Company (sailing yachts), Gardner Company (garden cutters), Humanist Company (furniture), and Guardian Company (locking systems). The company names have been replaced with fictious names in order to protect the integrity of the firms. Common to all these firms was their adherence to the set of criteria for this research. All the companies studied were mature, autonomous, relatively large firms in the branded consumer goods sector, producing products and related services. Both the Guardian and Gardner brands belonged to a conglomerate, but the companies were still managed to a large degree as independent businesses. All the firms in the sample sought to professionalize their innovation and chose product renewal as the prime long–term business growth driver. Two of these firms, as it later turned out, could not be classified as repetitively innovative under their present regimes. Table 9 summarizes the profiles of the firms observed in this study. The figures in the table are only indicative, for discretion and to honor the anonymity of the firms participating in this study.

	Player	Humanist	Plumber	Gardener	Guardian	Adventurer
Employees	350	50	1,000	3,000	1,200	400
Age	40 years	70 years	60 years	130 years	100	40 years
Revenues	€50 million	€20 million	€150 million	€500 million	€200 million	€80 million
Ownership	Family	Private	Family	Listed	Listed	Private
Industry	Playgrounds	Furniture	Faucets	Garden tools	Locking	Yachting
Position	One of top 3 firms in Europe	Niche leader in domestic market	Market leader in north–east Europe	Several new to the world innovation awards	Numerous international patents base of revenues	Niche leader in the international market

Table 9. Profiles of the Case Firms.

Gardener Company

Gardner Group was founded centuries ago. At the time of this research, it was divided into three corporate subsidiaries: the Gardener Company, and two other branches. Gardener Company is divided into four unique consumer product divisions: Craft, Garden, Housewares, and Outdoor Recreation. The Garden Division of Gardener Company, one of the cases studied in this research, was the leader in developing innovative garden tools and accessories, offering a complete line of durable and efficient products to make gardening easier.

The company evolved from a scissor company into a garden company in the early 1970s. The company's first garden cutter was the starting point for this case discussion: the first product of the transition from a scissor–oriented company to a garden–cutter company.

Plumber Company

Plumber Company developed, manufactured, and marketed user–friendly and innovative faucet systems and related valves and modules. The company had decades of experience in designing faucets and using a variety of materials, as well as solid expertise in software and hardware, which was gained by developing and manufacturing user–friendly products.

The seeing electronic faucet, as they called it, was the starting point for the discussions in this case. This faucet is a product for which the Plumber Company can be justly proud. The seeing faucet uses just the right amount of water—neither too much nor too little. Users can turn the faucet on and off without touching it, merely by placing their hands under it; water immediately begins to flow at the preset temperature. The faucet also shuts off automatically, thereby enhancing hand hygiene.

Guardian Company

Guardian was a leading manufacturer of locks, locking systems, and architectural hardware, and the world's leading developer of products in the field of electromechanical locking technology. The operation of the patented Guardian high–security cylinder is based on a unique principle that employs rotating detainer discs. The cylinder provides superior master–keying features without compromising security. It is an ideal arrangement; just one key gives access to all the doors under the user's control. Guardian Company was able to offer its customers a selection of key systems, key profiles, and patented key–security levels, with a factory–controlled key service.

Guardian Pro employed restricted key security levels, and key duplication was limited to the Guardian dealers with special key–cutting machines. With 2 billion possible combinations, even the most complicated master–keying system could be built. Discs of this product are more durable and reliable because they resist fouling by dirt or corrosion, and they have no springs and pins. Hardened steel and carbide

inserts protect cylinders, and the unique construction makes the Guardian Pro virtually pickproof.

Humanist Company

Humanist Company was renowned for having made one of the most innovative contributions to modern design. Long–term durability and high quality, combined with a clean–lined form language, were essential elements in the creation of every product bearing the Humanist name. Humanists' iconic status was founded on innovative design, thanks to its founder, August, who invented new methods for bending and splicing wood to realize the revolutionary structural ideas and fluid organic forms of his most dynamic designs. Humanist Company's most famous collection was a comprehensive furniture system that could be used in a variety of situations including public spaces, offices, museums, schools, hotels, and homes. The versatility of this collection allowed the user to customize furniture for individual projects.

Humanist Company was exceptional in the research sample, as it had no track record of current innovation. New management was in place, and its ambition was to revive Humanist Company's past reputation as an innovative firm.

Player Company

Player Company was one of the leading playground equipment producers in Europe. In its homeland in the most northern part of Europe, it was the largest supplier of playground equipment. In addition to play equipment, Player Company's product range consisted of sports equipment; park furniture; and street furniture, such as benches, bicycle racks, and garbage bins, all of which were produced mainly from strong pine wood, derived from pine trees common to northern Europe.

The founder, Andrew, started the company in 1970, and ceased active participation eight years ago. At the time of the study the company

employed approximately 200 people. There were daughter companies in five countries, and together they exported to over 40 countries. In 2006, the turnover of the company was some €50 million euro, and it was profitable.

The starting point in these case interviews was the technology–driven playground gear, TechGear, a product that was, at the time, an evolutionary model rather than a commercial product. During its entrepreneurial era, the company had a number of innovations. The first was the playground equipment, which was first built industrially. The modular concept of the product existed from the beginning; later innovations were customer customization, several imaginative playground concepts, playground maintenance service, and the positioning of the playground close to schools. When the first CEO succeeded the entrepreneur, however, the focus was apparently directed, because of financial constraints, toward operational improvements. During that five–year period, the firm did not deliver any successful product invention.

Adventurer Company

Adventurer Company was founded in 1960 by Peter. Peter's intention was to build the first 10–meter yacht capable of both cruising and racing, using fiberglass and molds. At the heart of his concept was quality, the core focus of Adventurer's production process throughout its history. Series production was considered key to the success of the venture, and precise, logistical organization was paramount at an early stage.

The expansive Exodus portfolio has charted the journey that Adventurer has traveled, from the inaugural Exodus 36 to the ambitious 130. Adventurer's Exodus yachts were considered to be the ultimate ocean–going, performance, luxury sailing yacht of unrivalled quality. Adventurer Company reinforced its position at the top of the ladder for both pure luxury and revolutionary technology by opening a new, hi–tech boatyard.

The starting point for discussion was the first one–design yacht model, Exodus 45. Adventurer conceived of its 'one–design classes' to satisfy the most experienced sailors in racing and cruising, combining the company's experience and tradition with new technology and speed.

3.4.1 Approach and Prospective Discussions

Once the sampled firms were identified, each firm was approached with a written proposal. The proposal was usually addressed to the CEO, and, if successful, led to a meeting for initial discussions, during which the outline of the project and the research objectives were discussed, along with the strategic ambitions of the firm. If, and in most cases when, the goals of this research coincided with the managerial goals of the firm, an agreement to initiate a project was reached. Of the eight companies approached, two rejected the proposal. In each case, the contact had been made not with the CEO, but with a senior line manager. In both cases, 'bad timing' was the stated as the reason for not participating.

3.4.2 Preparations and the Questions

Lead questions were formulated prior to the interviews in order to stimulate discussion about a success story that had been identified. The choice of questions in the semi–structured and open–ended interviews was influenced partly by the findings in the literature review and partly by the definition of the research question and scope (see Appendix B for the questionnaire). The literature phase provided an understanding that enabled me to distinguish certain, lesser–known fields of knowledge. A key choice was also to address a recent *innovation project*. During the practical interview, the order of the questions and the phrasing of the question were altered, depending on the position of the person being interviewed. The rationale was that a CEO has a slightly different perspective, vocabulary, and priorities, compared, for instance, with a line manager,

whose primary concern is much narrower. The order of questions varied, based on my judgment of the easiest way for each respondent to begin the interview. Naturally, the respondents were easily diverted from the line of questioning to follow their own point of view. How, then, can the chosen cases be generalized to describe the innovation of firm level? This question is addressed in the end of this Part 3: Methodology.

3.4.3 Identification of the Key Actors

The sessions on which cases were based were usually initiated with the CEO in a preliminary and unreserved discussion about the firm's strategic reasons for participating in the research. During that discussion a recent innovation *case* was mutually defined. That choice generated the *persons* appropriate to be interviewed—people who had been driving forces in moving the identified invention into reality. Prior to their interviews, these people were briefed by the CEO who communicated the firm's motive for participating in the study and outlined the purpose of the study. The CEO was provided with a one–page summary of the my intention for the PhD project.

Initial discussions with the CEO identified four or five driving forces of innovation in the firm. The role description for those actors was based on the Gemünden and Hoelzle's (2005) definition of the promoters of innovation (see Appendix C). The model distinguishes among a Power Promoter (a person with hierarchical influence), an Expert Promoter (a person with expert knowledge power), a Process Promoter (an internal organization administrator and collaborator), a Relationship Promoter (an inter–organizational cosmopolitan), a Technical Gatekeeper (an external scientific net worker), and an Opponent (one of many people resisting innovation). The aim was to meet at least a Power, a Process, an Expert, and a Relationship Promoter, if those roles were possible to identify.

The starting point was generally with the CEO, on the assumption that this person was likely to be a Power Promoter of innovations. In

principle, our discussions concerned the innovation *case* to be examined, with the *persons* being the key driving forces behind the realization of that innovation. The Power Promoter, the Expert Promoters, and the Process Promoters were usually easy to identify, although it was common for one person to play several roles. The Relationship Promoter and the Technological Gatekeeper appeared to be slightly more difficult for the CEOs to distinguish, whereas the Opponent appeared to be an underground force. It is not surprising that specific names were rarely mentioned during discussions about the opposition, but that names began to spring up later in the interviews. Informant bias was reduced in this study by interviewing several persons acting in various positions, recruited according to the definition of the promoters and the CEO's perception of subordinates.

3.4.4 The Interview

Each interview lasted for approximately 60 to 90 minutes, was conducted in the leader's working environment, and was recorded on a digital recorder. The persons who were interviewed are listed in Appendix G. A picture of the 'time line' of the company's various product generations was used during the discussion to stimulate the interviewee's memories and associations to the innovation topic. If the firm was not in a position to produce a time line, an example of another company's time line was used to stimulate thinking and help keep the discussion on topic. The sessions always addressed stories related to the *conditions*, the *role play* of senior management, and *one specific case of innovation* in the organization. The interview was initiated with small talk that was not recorded. The session always concluded with an open question addressing some essential issue that had not arisen in the discussion. That question usually triggered the respondent's personal angle on the topic. The longer the interview lasted, the greater the quality of information was obtained.

The interviews were conducted between April 2006 and January 2007 in each respondent's language of choice: Finnish, Swedish, or English.

3.5 Coding Data and Establishing Data Structure

The recordings in Scandinavian languages were transcribed word for word, primarily by one typist; another typist transcribed the English text. The processing and coding of the data were done sentence by sentence on a key–word–for–word level. The coding was registered with a particular text analysis software[9] for coding qualitative data. It is a tool enabling researchers to deal with a greater volume of qualitative data, designed to increase the traceability and consistency dealing with the big volume of empirical data.

The written text per interview typically consisted of some 20 pages or some 7,000 words, and generally required two or three working days to code. The coding of the first interview began with my picking and listing keywords from the text. For each appearance of a keyword, the whole of the sentences or the paragraph containing this keyword was coded. Through this process, the keyword was embedded in a situation, which later became useful in interpreting the expressions and the terminology used by interviewees. The paragraphs of the text reflected the logical sequences of the speaker's thinking (Figure 29). This matter is relevant, as the number of text lines in each paragraph was associated with the analysis of the keywords identified in each paragraph. Thus, the volume of text associated with the keyword indicated, to some extent, whether a little or a great deal was spoken about a particular topic.

9 *QSR N6*

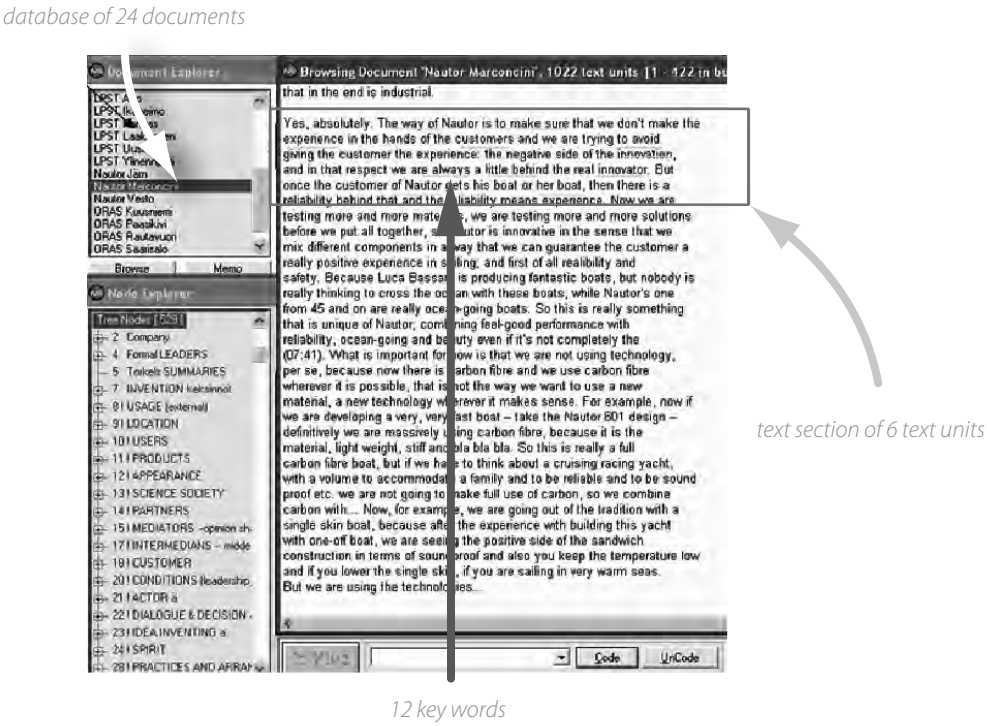

Figure 29. Sample of Coding.

After reading the text of the first interview, I categorized the material, and thus the first groupings of the words emerged. (Part 4 of this book describes the empirical findings, which are structured according to these categories). The first classification of words was done by grouping related keywords. Particularly for the interviews that were conducted in Finnish, it was essential to account for the situation in which the word was expressed, because the Finnish language has extremely rich grammatical derivations, which frequently redirect the meaning. A separate notebook was used both for recording the keywords and maintaining the descriptive text for each category (a sample of the notebook is shown in Appendix D). This measure was necessary in order not to be diverted from the logic of coding the texts when processing the following interviews. The interviews were coded between 7 April 2006 and 2 March 2007.

After the initial coding, the next steps were coding of the second, third, and fourth interviews. The work proceeded sentence by sentence, word by word, matching the words of the previous interview, and adding new terminology, expressions, and thinking into the picture. The effect of additional words and expressions used in the second, third, and fourth interviews made the initial category structure for coding obsolete. Not only did people talk about different matters, they talked about the same matters using different words; the same words had different interpretations; and the same matters had different associations in the minds of different speakers. The volume of keywords grew radically with the second interview, considerably with the third interview, but less with the fourth interview. The implication was a need to revisit the level for the themes of observations. Because the frame of thinking was not equal for each speaker, a new structure evolved from a personal to an interpersonal structure. At this phase, the first judgment of the *associations among* various categories was addressed. Before this exercise, the individual categories were not connected with one another. Clearly some categories are more closely related to each other than others are.

The strength of each *category* was assessed by cross checking each category with all the firms. Some keywords have been chosen from the empirical material of each category to represent each property. It goes without saying that the words are merely a sample from a register of many similar words. Table 10 exemplifies the properties of one of the categories—*use of the product*—which has the properties of the *act*, the *experience*, and the *outcome* of using the product.

Use	Player	Humanist	Plumber	Gardener	Guardian	Adventurer
Act	Play	Illuminate	Shower	Cut trees	Locking	Sailing
Experience	Fun	Home feeling	Intimacy	Force	Easy	Joy
Outcome	Skills	Light	Hygiene	Tidy garden	Privacy	Life style

Table 10. Empirical Description of the *Use of a Product.*

As the matrix illustrates the properties of usage of the innovation, it can be traced in all the cases. Playing, illuminating, showering, cutting tree, locking doors, and sailing forms a consistent group across the board. The unifying conception is that they are all examples of doing something—performing some task or solving some problem—with the product innovation. However, the strength of attention across cases varies. Therefore a measure that distinguishes between the differences across the cases is introduced below.

3.5.1 Processing Empirical Observations

The unfocused empirical findings did not respond to the research questions as such, and that was why a data reduction step was required—one that could be carried out without losing the essentials of the empirical material. This was accomplished by grading the findings in a way that distinguished the issues that were mentioned more often and the issues that were mentioned less often. Furthermore, the DSM method and matrix was introduced as an approach to discovering the associations among categories. DSM is an acronym for Design Matrix Structure (Pimler, Eppinger, 1994). Finally, Actor Network Theory (Latour, 2005) was introduced to draw attention to the core of the phenomenon studied.

3.5.2 Grading of the Findings

The magnitude of discussions varied across categories of the empirical material. Some things were discussed more than others. Attention to the categories and the properties was measured by the number of text units (lines) describing the extent to which each issue occurred in the leaders' interviews. Some matters appeared in the discussion more significantly, whereas others appeared to be of less concern.

In order to judge how important a category and its respective properties were in the discussion, it was necessary to introduce a scale (Table 11). A category or its properties fell into the *significant (S)* class if the number of text units of the category exceeded the average plus the standard deviation of all the text units coded for each category. The observation was rated *modest significance (M)* if the number of text units fell within the standard deviation. If the category text units were below the average number of text units minus the standard deviation, it was classified as *low significance (L)*. If there was no text recorded for an observation, it is classified 'no attention' in the leaders' interviews. The purpose of this grading of categories and properties was to enable me to distinguish particular patterns in the empirical material. Questions about validity of the proposed scale and other related considerations are more thoroughly discussed at the end of this Part 3: Analysis.

Significant attention	S	x > average + standard deviation
Modest recognition	M	x within standard deviation
Low significance	L	x < average – standard deviation

Table 11. Grading Standard of the Observations.

The average of the coded text units was 4,111 text units per category, and the standard deviation was 2,045 text units. The coding of text units per category ranged from 766 to 7,144. A matter like the discussions of *conditions* was judged to be a significant matter when solving the riddle, as the category had the largest number of text units recorded: 7,144. The full range of categories of the empirical material is summarized in the Table 12.

1,986	Use
2,714	Location of Use
1,717	Users
7,144	Products
2,728	Appearance
1,426	Society & Science
2,711	Partners
766	Mediators
3,288	Customer & Competition
7,144	Preconditions of Leadership
7,016	Activists
6,446	Decision Making
6,285	Invention
3,936	Spirit
3,520	Practices and Arrangements
3,851	Learning and Skills
5,078	Functional Structure
1,641	Process Control
5,789	Project Administration
5,802	Sales, Marketing Promotion
5,072	Economics
5,982	Time Factor
4,902	All Barriers

Table 12. List of Categories of Empirical Material.

The processing of the entire 24 interviews result in 23 categories of observations and 121 properties describing those categories. Part 4: Empirical Observations outlines a description of each category and its properties. The barriers will be brought up in connection to the description of each category. The time factor is addressed separately in the Part 5: Analysis.

3.6 Reliability and Validity

Earlier in this part a few vital questions concerning the methodology were left unanswered. One question remains: How can the generalization be justified when the discussion was started from one case, and ended in an analysis of the firm in general? The rationale justifying the generalization builds on three arguments. First, the design of the questionnaire was clearly addressing the general management aspect of the firm. Second, even though the discussion was initiated by talking about one case, the outcome in the interview was that the interviewee had spoken about several projects. In each case study, there are recorded references to experience from several projects. Third, even though product innovations were the key issue in the interviews, the empirical material consistently shows evidence of attention to the broader view of the firm.

The quality of the study depends both on the reliability of the underlying material that is assessed and the conclusions that are sensible and acceptable to draw from the scale—the validity of the scale. *The analytical approach builds on the assumption that the data reveal several things about leadership in innovative firms. For one thing, the leaders spend most of their interview time on the topics that concern them most. Furthermore, it is assumed that the time the leaders spend on the interview topics reflects how they have devoted their attention when they master the innovation activity in the context of the entire firm.* The idea of focusing on stories about specific events was to enhance the connection between actual action and their talk. The reliability of the

empirical material is partly addressed in this way. Discussions about how things *should* be done, which naturally also occurred in the interviews, came to have more of a predictive value, and ran a higher risk of being more loosely connected to actual action. The interview was designed to give the informants the freedom of emphasizing whatever was on their minds. The semi structured interview approach served as a mechanism that yielded, at minimum, comparability across interviews. When several informants were interviewed per case, it was assumed that the time spent discussing a given issue with informants evens out—that one informant would devote a great deal of time to that issue and another informant would have little to say about it The coding exercise demonstrated that in the end the entire field of topics was reasonably well covered.

One might also wonder if the logical basis for the categories and properties are fair. On one hand, it is a matter of how consistently the coding work has been done and the logical order of the structure of categories and properties. On another hand, the study of the statistical variation of attention across categories is not independent of the decision about the width of a category. A narrowly defined category runs the risk of being less easily recognized than a broadly defined category. The logical bundle of key words has been the leading thought when the categories and the properties have been composed. This notion was later tested in the study. When it comes to the validity of the scale, the data reduction revealing the key scope of the leaders does cover potential pitfalls. Can a secret—something about which nothing is said—not also be a vital piece of information? The same question applies to implicitly communicated pieces of information. Surely the research method applied in this study does have blind spots. The concern of the validity of the empirical structure is addressed through a transparent and comprehensive description of the empirical material in Part 4: Empirical Observations. Furthermore, the design of the research strategy to test the outcome of the analysis is designed specifically to test issues of validity. The six stories of each case and the exercise to connect these stories to relevant theory

are found at the end of this book. The result of that test provides an open view of the merits, to allow the reader to judge if the result of this study is acceptable and worth being treated seriously. Eventually, it cannot be avoided; the conclusions and the outcome of this study are, in any case, dependent upon some portion of fair judgement. That is why a great deal of energy has been devoted to ensuring good traceability of evidence in this research report.

Summary

In summary, the purpose of the description of the empirical domain is to become familiar with the ideology of the leaders interviewed. The empirical material consists of 509 pages of transcribed text, equal to 24,773 lines of text, or 229,034 words from the total of 24 individual interviews conducted in the six case firms. Similar keywords were assembled and were later given the labeling property of a category. The categories emerged when similar and related groups of properties were assembled. When the categories were assembled, the structure of the empirical material in this study was born. That is, the keywords generated the properties, and the properties ended up as categories, and the categories stand for the structure of the empirical findings. The reporting of each category gives a description of the uniqueness of the category, a description of the observations, and a comparison between the cases. In the process of categorizing the empirical material, the individual interviews were combined into one text body for each firm. Hence, the respondents of each company become 'one voice' talking in the empirical material. That is, the leaders collectively introduced shared stories of their firm. The connection of the empirical observations to the existing theory in each field of knowledge is made in the summaries of the Part 4: Empirical Observations; in Part 5: Analysis, in connection to the found critical areas of attention and in connection to the test in which each case story is examined; and finally, in Part 6: Conclusions.

PART 4: EMPIRICAL OBSERVATIONS

Empirical observations from the all six case firms are highlighted in this part of the book. The purpose of describing the empirical domain is to familiarize the reader with the thinking of the leaders, i.e. of those who lead the firm and who are engaged with the innovations of the firm. A further purpose is to introduce evidence of consistency among the structures across cases. Part 4 should provide the reader with a deeper understanding of the leaders' thinking when they talk about leading innovation in their firms. On the most general level, four *domains* of discussion emerge. The leaders describe the leadership of innovative firms in terms of 1) *external rulers*, 2) two internal dependencies of *motivation–driven* and *rational systemic*—the *general* dependencies of *time aspects* and *barriers of innovation*. Figure 30 illustrates an overview of the thinking of senior managers.

Figure 30. Three Domains in the Thoughtworld of Leaders in Mature Innovative Firms.

Each domain of attention comprises various *categories of discussion*. The external dependencies include the use, the user, the location of the use, and the appearance of the innovation. Each category is like a room in a house. The *properties,* subordinated to the categories in this description, are like the furniture in the room. The category of *use*, for example, is described more specifically by the activity–related properties connected to the use: the experience of using and the outcome of the use of the innovation. This further elaboration introduces a more specific landscape of attention. Figure 31 illustrates this landscape and forms the main point of reference throughout Part 4 of this book.

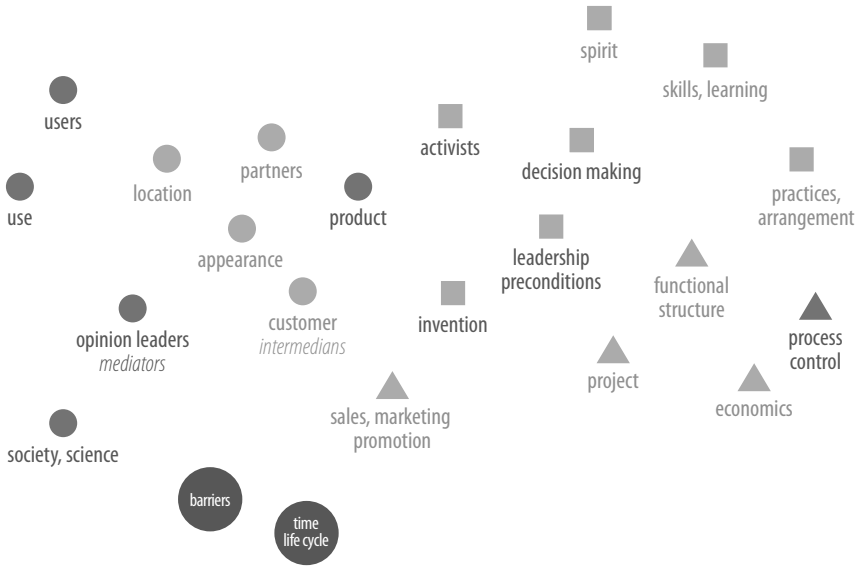

Figure 31. Landscape of Attention in the Thoughtworld of Leaders in Mature Innovative Firms.

A separate section is dedicated to each category of discussion:

- an introduction to the discussion,
- a description of empirical *observations* of each category,
- a *comparison of findings* across the six cases, and
- examples of *barriers* encountered.

The findings are illustrated in a number of ways. A comparison of key findings among the cases is illustrated in a *table of observations* on a general and a detailed level and the general matrix illuminates the attention that leaders have devoted to each subject in the matrix. Significant level of attention has the symbol (S) in the table, the low attention symbol (L), and the mid level of attention symbol (M). A *positive* description of the observation and a description of the *negative* barriers are presented in order to enhance an understanding of the discussions.

The presentation of the empirical findings was a journey. The more deeply I delved into a category of discussion, the more visible the connections to other categories became. Thus one discussion led to another, resulting in a tremendous network of dependencies among the categories observed. The question arose: 'Does *this* matter actually belong to *this* or *that* discussion?' As everything appeared to be connected—directly or indirectly—to everything else, a sequentially written story of the whole assumes that choices were made when the structure of the report was decided. Looking at the landscape figure, one could ask: 'Where should the story begin? Along which line of thinking should it proceed? To what should attention be paid?'

The structure of this book represents my personal choices, based on prior knowledge and by the support of the theoretical frames presented in chapters. The grouping of the categories on a detailed level was another such choice. A reading of Part 4: Empirical Observations should clarify the meanings and merits of the choices made, yet it does not resolve the debate over what is the heart of the matter and what is the best line of thinking. In the end, it is evident that the construct is based to some extent on my

own judgment. The matrix analysis is used to reduce any tendencies for subjective judgment.

To summarize the remainder of this book, Part 4 focuses on *empirical* observations; Part 5 presents the analysis of the main discussions and their *dependencies*, as well as a test of the validity of the results. The conclusions and connection to theory is presented in Part 6: Conclusions and Discussion.

4.1 External Rulers

The domain covers observations from the discussion, predominantly emphasizing the factors influencing the firm: the environment of the firm. It is characteristic of environmental factors that the firm has limited or no control over these external matters. The firm cannot, for instance, *decide* who becomes the user, how the user perceives the novel product and chooses how to use it, or if the user finds the innovation useful. When the merits of innovation are being judged, 'beauty is in the eye of the beholder'. The final merits for the *raison d'être* of the innovation are given not by the firm itself, therefore, but by the external environment. That does not mean that the firm could not exercise some influence over these areas, however. The available means, like defining segments and target groups are introduced in the section Internal Systemic–Driven Categories of Observations. It could be argued that some fields are easier and some more difficult for the firm to grasp.

This domain of thinking consists of nine categories of discussion. The externally oriented discussions addressed by the leaders are the use, the user, the location of use, the product, the society, and the appearance of the innovation. External actors addressed are the partners, the mediating opinion leaders, and the intermediary customers. The competitors, which were given marginal attention in the interviews, are incorporated into the category of Customers. The low attention on competitors may be explained by the pioneering nature of how innovation was perceived by the leaders.

The regulators, which were given little consideration either, are part of the discussion labelled as Society and Science.

4.1.1 The Use

The leaders discussed what occurs when the innovation is being used—when it is in the hands of the end user. The leaders generally recognized and devote little attention to this theme. As they began to spend more time on the theme, however, greater attention was given to the detailed subjects of *activities* of use, momentary *experiences,* and the enduring benefits that the user receives from use of the product innovation.

Observations: Understanding the activities associated with the use provided the final say about all the intentions in the process of developing the product. To some degree there is predictability in the *activities* of use, according to the type of product. Activities like bathing, washing hands, locking, cutting, sitting, playing, and sailing tell us something about how the product is to be used—but by no means exhaustively, as the list is as long as the imagination of the user. And when some feature of a product is substituted for another, a new set of activities using the product is likely to occur. Assuming that there is a diversity of activities associated with using the product, and a multitude of users, it most probably leads to an even larger diversity of *sensations* using the product. The corresponding sensations using the product were, for instance, a moment of intimacy, feeling of safety, experience of force, and sense comfort or enjoyment. Research in this field elevates the idea of going 'beyond the instrumental' (Hassenzahl, Tractinsky, 2006) aspects of the use of a product. Many types of products are associated with a balance between the emotional and rational, which makes the discussion about the momentary sensations experienced when using the product particularly vital. The more explicit counterpart (and more enduring, compared to the tacit sensational aspect) was discussed in terms of the *outcome* of using the product. The outcome may be stated in such terms as improved hygiene, a tidy garden, physical skills, the climate of a home, the barring of entry, or the crossing of an

ocean. As could well be expected, there were no sharp lines between the momentary and implicit sensation of using a product and the more enduring and explicit ends of the use.

Patterns of Observations: The empirical material demonstrates that the theme about usage is generally not an area to which the leaders paid much attention, although Humanist Company represented a clear deviation from the population. Otherwise, as illustrated in Table 13, there was common evidence of a medium level of attention devoted to this subject.

Player	Humanist	Plumber	Gardener	Guardian	Adventurer
M	L	M	M	M	M

Table 13. Cross–Case Comparison of Significance of *Category Use*[10].

Use was generally discussed in terms of the act, the experience, and the outcome, in modestly recognized cases. Only at Gardener Company was there a tendency to talk more about the act of using, as illustrated in Table 14.

Use	Player	Humanist	Plumber	Gardener	Guardian	Adventurer
Act	Play	Illuminate	Shower	Cut trees	Locking	Sailing
Experience	Fun	Homey feeling	Intimacy	Force	Ease	Joy
Outcome	Skills	Light	Hygiene	Tidy garden	Privacy	Life style

Table 14. Cross–Case Comparison of Observations *of Use.*

The barriers connected to the activity of using the product were associated with various types of malfunctions and various difficulties. A barrier of the most basic nature occurred when the user did not know how to use the novel product. As one chief designer said, 'We had this pruning stick, a new design, and it wasn't entirely evident that people realized how to use

10 M = modestly recognized, L = low attention, S = significant attention

it properly. We were obliged to go on developing for two more years'. The most common complication was the innovative product not working as intended: like a lock that unintentionally unlocks. From an engineering perspective, which appears as a highly recognized matter of innovation, the fault can be minor and simple to correct. But if the fault escalates into negative experiences for customers using the innovative lock, the fault violates the user's core value about using the lock: a feeling of security. If the lock does not work, it does not prevent intruders from causing chaos in the house. In the worst case, the malfunction can impair the lock manufacturer's entire business. The lock's malfunction may also be minor. The lock may work safely, but be difficult to use; there can be too much friction in turning the key, for example. Such a malfunction would probably not cause the lock to be rejected, but may render the future life of the lock unpredictable.

In general, the complications connected to usage were only modestly recognized in the discussion. On a more detailed level of discussion, however, the *activities* involved in using the innovation served as a predominantly recognized area of difficulty. However, the voice was not entirely consistent across all the cases on this topic.

4.1.2 The Location of Use

The location of use was discussed more than was the use of an innovation. Yet, this appeared not to be a field of significant attention among the leaders. They discussed the location in the context of where the act of use was played. This discussion was close to the discussion of use, as the product was anchored in its proper environment throughout the discussion. The appropriateness of the location influences the use, and thereby influences the character and probability for the success of the innovation. Furthermore, the location lends the company direct contact with the users, with the users, and with the environment for gaining experience. The diverse connections with the location indicated that the

choice of location was of particular importance, both for finding opportunities and for the success of innovation.

Observations: The detailed discussion about the location consisted of discussions about four aspects of the location: the specific place where the product is used (*the stage)*; the larger environment in which the use takes place (the *arena)*; the product belonging or directly connected to the use (the *staging)* of the product; and the piece of life on the stage and arena (the *show)* associated with the use.

When the ends of an innovation are connected to the specific place or stage, it comes into the area influenced by inherent associations of that place. The more particular the *stage* was, the more embedded was the innovation into other dependencies of that particular place. In these cases were such stages as the bathroom, the toilet door, a kitchen, a playground, and a flowerbed. The product determined the *hot spot* from case to case as well as the proper level of abstraction. The place was not located in an orbit; rather it is positioned in the discussion in a chosen frame of reference: the *arena*, as it is labeled here. Then the corresponding discussion about the environment emerged as discussions about a luxury flat, public buildings, the garden, the schoolyard, and so on. But knowing the stage and arena complemented discussions about what is there. The discussion had the character of a material and activity associated with that particular location. The discussion suggested that the tables were set before an innovation arrived at the table, and knowing the play was part of what appeared to be vital knowledge. That is why this category of discussion also addressed elements like a bathtub and the plumbing, the door and the frames, the ladders and apple trees, the school scheme, the movable property—all of which have been called the *staging* here. Closely associated with the same discussion is the activity—the *show*—which was raised in discussions about such topics as garden work, play and education, people going in and out, and the process of buying a house.

Patterns of Observations: The observations in this discussion reflected vastly different levels of abstraction, because the products of these six firms

differed widely. For one firm, the stage may have been the Sardinian Sea; for another, a bathroom. This disparity mirrors the fact that for the first case the product was a yacht, and for the second it was a faucet.

On a general level, the discussion about location was only modestly recognized across cases, with the exception of Adventurer Company, which stands out in this sample because the discussions related to location generated little attention (see Table 15).

Player	Humanist	Plumber	Gardener	Guardian	Adventurer
M	M	M	M	M	L

Table 15. Cross–Case Comparison of Significance of *Category of Location.*

Despite the consistency that occurred on general level, there were major deviations on a detailed level, i.e. the matter was addressed from many different angles. On detailed level, there was no coherent pattern of attention paid when addressing the topic of location (see Table 16).

Location	Player	Humanist	Plumber	Gardener	Guardian	Adventurer
The Stage	Schoolyard	Living room	Bathroom	Plantation	Control room	Sardinian regatta
The Staging	Schedule	Decoration	Bide	Apple tree	Door	Fleet of yachts
The Arena	School	Home	Private home	Garden	Building	Sea
The Show	Education	Basic living	Buying a home	Apple farming	Electricity supply	Racing

Table 16. Cross–Case Comparison of *Observations of Location.*

It has been suggested (Christensen, Raynor, 2003) that knowing what job a product 'gets hired' to do provides an innovation with better direction

and the ability to compete against other innovations that are doing their job poorly. Analysis of this field could shed some light on 'non–consumers' and their grounds for not consuming.

Complications related to the arena came in many forms. The trouble of distance and dialogue was discussed in the Guardian case: 'We do not really get any feedback about our product from the house building sites'. Problems with internal legitimacy was a concern of Gardener: 'The first products that we made for the garden landed in the middle of internal turf politics—*the office* or *the garden*—which made it complicated'. In the Humanist case, similar internal friction appeared in connection with the arena: 'Our product development has not internalized our ideology of the *living space*'. For the Gardener case, then, it was a case of not wanting; for the Humanist case, it was a case of not knowing. Furthermore, discretion prevented the firm from using the pride of the connection to the arena in Guardian's case: 'No, we cannot use our *client buildings* as public references, because our customer relationship is sensitive'. In the Adventurer case, the trouble was the opposite, due to a product failure on the arena: 'It was at the *Mediterranean Sea regatta* that we had to replace several faulty rudders, which not only caused us bad publicity, but also resulted in a decline of sales'. In the Player case, the arena turned out to be a difficult crossing of several actors, roles, and powers to lead and decide: 'The *real estate* owner is one; the facility manager is another; the *school* teacher yet another; and our electronic and education–oriented playground falls a bit on every sector. But there is nothing from our past practices to tell us who should drive or who can make the decision about this new matter'. In some cases, the change in the current state of affairs did not occur as a barrier, but was stated as an opportunity; 'A *play ground* [stage] is usually a given part of the *school yard* [arena] where our products are used, and our goal is that it would also become a part of the *school scheme* [staging] and a permanent part of *education* [show]'.

4.1.3 The Users

The leaders discussed the users—those who were not selling anything forward but were using the innovation solely for their personal interest. The user is not necessarily equal to the end buyer or customer. From the interviews about users emerged descriptions on different levels: broadly speaking, the c*ommon user*; in more specific terms, the *first users;* various types of *characters;* and the *professionals*.

Observations: The *first users* occurred, for instance, in the pilot context. The first needle's eye to pass though may be, as in Guardian, the national security *authority* who investigates crimes. For Humanist it was an inner *circle of people* preceding the large audience in contact with new ideas; in the case of Gardener it was particular *apple farmers*, in combination with a celebrated gardener on TV; for Player, a particular *company of tenements*; for Adventurer, a particularly strong customer who is number one—*the first—customer*; and for Plumber it was a *particular hospital*. A remarkable aspect was that in all the cases, attention was clearly paid to and a united voice in the discussions about the first customer matter.

Another group of users constituted those labeled as *characters* of a particular kind. To some degree, these users overlapped the previous description of users, with the distinction that they were not necessarily first users. Examples of Humanist users of this type were art freaks, the 'little humans', and 'contemporary people of AA time', to quote those interviewed. In the Gardener case, a Madame Jones from Hästö was a user; in Player case, the users were the disabled; in Adventurer case, they were the round–the world yacht racers; and in Plumber case, the do–it–yourselfers. These users emerged as larger or smaller groups, but size did not appear to be a primary concern; rather, the distinctive character of the groups appeared to stick in the minds of the leaders and serve the function of an artifact. The 'little human' and 'the Madame Smith from Hästö' are both purely fictitious, but they served the function of a reminder and a projection to keep the user present and visible to the leaders running the

operations; they appeared to be sitting on a pedestal in the minds of the leaders.

The description of kinds of users is further extended by the users of the product for *professional* purposes. Occupational users were engaged in delivering added value in association with business operations. Again, there was an overlap with the former descriptions of individualistic users. However, the former group of users did not have the professional focus. This type of user emerged in the Guardian case, in which *guards* use the locks for barring access; in the Humanist case, in which architects use the interior for its symbolic value; in the Gardener case, where *tailors* use scissors in the making of clothes; in the Plumber case, with its *cooks* in public kitchens; and in the Adventurer case, in which professional *skippers* operate yachts. The occupational use of playground equipment did not occur, as 'pupil' was not counted as an occupation.

The final extension of the discussion about users focused on the *common user*. This subject was discussed in terms of communicating to a wider group of users. The users were commonly associated with male, female, family, and human–life–span–associated terminology. The common–user thinking appeared to be further extended to incorporate individuals in the private proximity, like neighbors and communities. The largest conception of the common users became almost universal expressions: 'everybody', 'middle aged', 'the Finns', 'the Germans', or 'the audience'.

The common user was not only recognized across all the discussions, it was also the most common label for all users. It should also be noted that the early users were recognized in the discussion across all cases. The same held for the recognition of particular characters of users. When talking about occupational users, however, only five of the six firms recognized this type of user. The type of product produced by the sixth firm—playground equipment—precluded that firm from identifying occupational users.

Patterns of Observations: The observations relating to the attention to the users were divided. For half the sample, the matter appeared to be

peripheral; and for the other half, the attention was average (see Table 17).

Player	Humanist	Plumber	Gardener	Guardian	Adventurer
L	M	M	L	L	M

Table 17. Cross–Case Comparison of Significance of *Category of Users.*

The lack of attention paid to the users was reflected at the detailed level, as there was evidence missing for some cases and subjects (see Table 18). It appeared to be common for attention to be focused on the first users and particular characters, in cases in which the attention on the user was not marginal.

User	Player	Humanist	Plumber	Gardener	Guardian	Adventurer
First user	Playschool children	Elite	Hospital nurse	President palace gardener	Criminal Police	No. 1 client
Characters	Disabled	Design freaks	DIY user	Lundström	…	Racing people
Professional	…	Architect	Architect	Apple farmer	Criminals	Skippers
Common	Generations	Finns	Anybody	Folks	Finns	Sailors

Table 18. Cross–Case Comparison of *Observations of Users.*

It is remarkable to notice that concern for the user was given marginal attention in half of the cases. This is a puzzling finding, given how critical the user is—the reason for the product, in fact. Furthermore, it demonstrates that there are limitations to the application of user–driven theory in innovation. Perhaps the user is of greater concern to employees at lower levels in the organization.

The barriers of the firm related to the user do not appear to be well

recognized. That outcome is hardly surprising, bearing in mind the low level of attention given to the theme in general. This is not to say, however, that fatal obstacles may be found in this field. To quote a chief designer: 'Sometimes we run into serious troubles when we have done all this, and then the user *does not understand* it when he comes across the new product in the shop'. It may have been a matter that could have been cured through communication, but in any case, it elevated the bar for the success of an innovation.

A similar barrier in this field appeared to be that the user did not see any beauty in an invention. As the project manager said of the playground equipment at Player, 'Technically and functionally, the *product design* brought nothing new and revolutionary to the *child*' An example of curiosity demonstrates that it is not always a case of understanding or perception. To quote an interviewee from the Plumber, 'The most dramatic obstacle was when a black doctor could not wash his hands. It was later realized that the touch–free faucet sensor did not recognize him because it was developed in a white community'.

4.1.4 The Product

The discussion category about the product was one of *the* most–discussed categories. This is not surprising of course, given the orientation of the firms and the focus of this study. Not only were the discussions about the product well recognized, but the topic was also connected to a broad range of related matters. The *product* was variously referred to as objects, as product *concepts*, in terms of product *features,* and in terms of *engineering structure* or *components*.

Observations: As seen in Table 19 and 20, the leaders had many different expressions for the product and collection of products; they seemed to think of it primarily as a physical object. The practitioners appeared to give the product several different labels—to give it a different character, depending on the meaning of the product in different contexts.

The product as a mere object appeared to be impossible to describe, disconnected from its associations. The term seemed to articulate the identity of the product, and simultaneously, the motives of the person speaking about the single *product*.

Product; physical product, novel product, innovative product, production product, continuous production product, main product, master product, industrial product, important product, ordinary product, volume product, special product, dummy product, standard product, simple product, bulk product, cheap product, me–too product, mainstream product, custom product, old–time product, private label product, license product, our product, living standard product, ideal product, competitor product, imported product, handicraft product, design product, spare part products, inventory product, campaign product, decent product, product close to heart, exotic product, stand alone product, classical product. Product range; product family, series of products, product portfolio, product generation, product collection, agent products, Aalto product, base range products, global products

Table 19. Variety of Product Terminology.

As seen in Table 16, the term *product* is also comprehended in a larger sense; in this book, it is labeled *product concepts*. To some extent, but not entirely, it means that the physical product is extended to comprehend intangible aspects of the product. It also seems to imply an assumption of a distinguished use of the product.

Locking systems; pad lock, building locks, machine locks, furniture locks, serial locks, mechanical, electrical locks, electro mechanical, cylinder locks, export locks
Furniture; couches, Villa sofa, padded sofas, stools, children's chair, tables, lights, beds, textiles
Cutters; scissors, paper scissors, pruner, lopper, spade, manure fork, axe, lawn cutter, hedge cutter, telescopic cutter, yellow, tools, cutter
Play ground gear; swing, slide, climbing frames, sandboxes, towers, ships, play tables, playhouses communication posts
Sailing yacht; performance yacht, one–design yacht, class yacht, super yacht, one–of yacht, classic yacht, cruising yacht, racing yacht
Faucets; two–function faucet, single lever faucet, thermostat faucet, touch free faucet, kitchen faucet, bathroom faucet, bath faucet, toilet faucet, wash basin faucet, water furniture, home faucet, public premises faucet, design faucet

Table 20. Variety of Product Concept Terminology.

It was equally common for the interviewees to talk about the product in terms of *engineering*—how it was constructed, as talking about it as an object. The subject appeared to be divided into a structural and a component level of discussion. The structural terminology comprehended aspects like product architecture, materials, technology, mechanisms, electronics, automation, modules, and tolerances. The line was not entirely distinct between structures and components, but for the purposes of this study the components have been interpreted as parts of the structure: materials like glue, metal, carbon fiber, bamboo; and architectural parts of the product like the hull, the lock cylinder and key, faucet thermostat, legs of the stool, and software.

It was common for the interviewees to talk about the product in terms of the distinctive or characteristic parts of the product (the *features*); or in terms of a quality ascribed to a thing (the *attributes*). This discussion allowed me to recognize the qualities of the product beyond the physical object: the product in association with the environment of use. The 'touch free' feature of the faucet, for example, comprehended a technological innovation and a particular functionality in order to work; yet, the touch–free feature was attributed to users who wash their hands without any physical contact to the tap. There were more conventional examples of features more closely related to the product itself: the Adventurer's racing keel, the Gardener's folding tool, the Humanist's pliable stool, and the Guardian's Internet–linked lock. Certain generic features of the products alluded to another direction: features like reliability, safety, durability, and distinction all came close to an area that could be perceived as *general requirements*. The subject of requirements is examined further in the discussion category about invention.

Patterns of Observations: On a general level, the discussion about the topic was clearly recognized in all the firms, which is hardly surprising, given the topic. In most of the cases, the product was a physical object. In one case, the service aspect was included in the product notion. In two cases, the project appeared to be part of what was perceived as a product (see Table 21).

Player	Humanist	Plumber	Gardener	Guardian	Adventurer
S	S	S	S	S	S

Table 21. Cross–Case Comparison of Significance of *Category of Product.*

The difference in the focus on attention across cases is worthy of recognition. In two cases, all four aspects of the product received a great deal of attention; whereas, at the other extreme, only one dimension of the product was mentioned: the object. The product orientation of the firms studied was also seen; in only one case was service mentioned at the level of the product. Another departure from the objective product can be seen in the way a project was discussed—as if it were a product of their firm (see Table 22).

Product	Player	Humanist	Plumber	Gardener	Guardian	Adventurer
Object	Product, service	Product, project	Product	Product	Product	Product, project
Concepts	Swing	Furniture	Faucet	Cutter	Lock	Yacht
Features	Rotating design	Stackable design	Hot/cold design	Folding design	Two–directional rotation	Flush deck design
Engineering	Modules	Wood	Electric	Mechanic	Electro–mechanical	Carbon hull

Table 22. Cross–Case Comparison of Significance of *Observations of Products.*

The base case of complications in this field of discussion occurred when the organization was innovation impotent. As a managing director said, 'Not having new products to show, we have to *talk hype*'. It was also typical that good attempts were made, without success. The problem of 'right thing, but wrong timing' was commonly heard: 'The infrared key system

technology failed because it was *ahead of its time*'. As such, the technological product was given the innocent role, but in combination with the situation, it ended up being wrong. In the end, it was impossible to say if the product was innocent, as it had never played a role in the market. In another environment the product might have been seen as an outright victim. In another case, the same situation was expressed by a managing director as: 'The problem was that the company has had *hazardous and incomplete product projects* that in the end have cost the firm millions in warranties'. In this case, the product later became successful, but seen from the criteria of warranty, it appeared to be the problem. It would probably have been advisable to dig deeper, as was done in a similar case in the Adventurer. As an operations director of Adventurer said: 'The failure of the delivery testing of the yacht resulted in catastrophes, when a number of customers received the yacht with *technical defects*'. In this instance, the cause was found to be not in the technical aspects, but in the testing procedure—in the absence of a particular test run. In both cases, the problem was probably caused by the premature ambition to launch a product in order to get revenues from the investment.

Another aspect of fundamental complications can be seen when the product lands in the middle of a disagreement over company strategy. As one managing director put it: 'The garden products were *politically incorrect* at that time, which is why it was difficult to get approval for those ideas, other than the scissors on which we were supposed to focus'. The division of responsibilities between subsidiaries introduced politics and conflict of interest. As the new product later conquered new ground, the product ended up being the right thing and the strategy the wrong thing. As the example demonstrates, a strategy can follow the product in a transitional period, but not the other way around. And now and then the interviewee did not really know or was not able to articulate that lack of interaction was the problem. To quote a marketing director, 'Sometimes we get too little market feedback on our new products, and sometimes our technical solutions are based on *one person's conviction* and self confidence'. That

statement demonstrated a claim of disconnection from the market, but the support claim was directed emotionally toward a colleague. What actually came to light was a sign of a succession period from one generation of management to the next. As this case demonstrates, the product innovation is taken as a means for that end.

4.1.5 The Appearance[11]

The discussions referred to the identity of the previously unknown invention, which was later perceived to be an innovation. This part of the discussion is about the *public recognition* of the new products being delivered by the firm. The discussion was divided into the spectator's perception of the *reason for the innovation,* and into the firm's *presentation* to craft whatever would result from the *appearance* of the invention. In the case of a successful innovation, one could argue, the presentation and the appearance are one and same. The latter aspect has several ties to what is commonly labeled marketing, an issue that is introduced later. But this discussion is a separate one, because of the particular nature of innovation at the border between the present unknown and the future known. This section is the consequence of what marketing at its best can produce.

Observations: The public recognition appears to have been a consequence of the presentation of the sender and the receiver's perception of the impulse sent. During the interviews, the firms aspired for recognition, credibility, legitimacy, appreciation, popularity, fame, and status, as illustrated by an example from the faucet case: 'If an innovative faucet is born, and everybody wants it, at the same time a mind set or a top–of–mind is being created'. This quote reflects that the firm was aspiring to produce a favorable mindset in their users, in order to be able to enter into deeper relationships with them. As mentioned in the section about the user, the state of mind of and the associations perceived by

11 The image as a word contains a variety of (undesired, artificial) interpretations. I therefore chose to use the term *the face* instead, as it is a cleaner and more to–the–point expression.

the user had a strong influence on what was being appreciated about the product.

The perceived *reason for being* reflects the essence of the product, or an innovation, seen from the spectator's perspective. Apparently there was a tendency in this instance to transcend to a different level of abstraction, rather than think of the product as a mere object. As one product manager said, 'I do not deal with lighting fixtures as a mere product, I think it is bought as a *piece of art'*. The product manager's perception was that people buy art and style for themselves—not merely a basic object producing light. Or, to quote Guardian's managing director, 'We are needed to protect money, not merely to sell locks'. That statement communicates the similarly of a perceived role in a bigger picture. The reason for being is also expressed through discussions of cultural attributes like collective memories, institutions, status, terminology, and word–of–mouth for making the reason for being of the product visible. In isolation none of these factors have any function, but in interaction with people they give a reflection and a coloring to the mere product as an object.

When we look at the other side of the coin we can see the appearance, as *presented* by the firm. The sender in this case was the firm; the receiver was the user. The discussion then turned to the firm's visibility and appearance to the public. The interviewees then told about their firms' need to impress with novel products, to be seen and heard. Novelty, image, good looks, and uniqueness were all focuses of the interview: 'I think that good functions are not enough for a faucet. A good looking product probably has an even greater impact'. It appeared that there is a great deal of noise in the market, and there was a great deal of discussion about distinctiveness keeping a product in the market: 'Needs differ across segments, so the products and services of playground equipment must be distinctive in the way it's profiled'. It seems then, that these leaders were attending to the issues of *where* to be seen, *how* to be seen, and with what *message* it is all being communicated:

Where: As the managing director of Plumber said, 'Today we are credited amongst the interior architects in the *design community and interior design magazines* for our courage to dare to join forces and faith with the Italians'. The example addressed the *where* in terms of the media and expert communities.

How: 'It is an image thing; if the leaf of the key is made of *plastics or metal*, which is seen as the real thing'. This statement by Guardian's technical director addressed the 'how' of the symbolism in the presentation. In this field of discussion, there were talks about icons like logos, slogans, brands, and trophies—all articulating distinction.

Message: As the competitive environment for the firm in the market is crowded, it results in constraints in formulating the firm's message. In their company slogans, for example, the firms condensed their messages to the minimum text that would convey the maximum meaning to the receiver: 'Growth through play'; 'Tools of inspiration': 'Water is worth loving'; 'Nordic common sense'. They all served as good evidence for further discussion about the dependencies of the firm in presenting itself and its new ideas.

Patterns of Observations: Generally speaking, the discussion about appearance received only average attention, as shown in Table 23. The clear pattern has only one exception: where the matter is of more silent character.

Player	Humanist	Plumber	Gardener	Guardian	Adventurer
M	M	M	M	L	M

Table 23. Cross–Case Comparison of Significance of *Category of Appearance.*

On a detailed level (see Table 24), a distinct pattern of recognition is difficult to distinguish. If any judgment was made, the attention on the

presentation of the firm was recognized to an above– average level. The discussion about the reason for being was equally well recognized across the cases; whereas the consequential state—the public recognition – received minor attention. The emphasis of the concerns of presentation is in line with the fact that all the firms selected for this study were seen to be, and understood themselves to be 'brand houses'.

Appearance	Player	Humanist	Plumber	Gardener	Guardian	Adventurer
Reason for being	Upbringing values	Symbol of ideology	Saving water	Extending hand power	Protecting buildings	Self–identification
Presentation	Slogan	Fashion publicity	Single brand	Orange symbol	Technology profiling	Luxury brand
Public recognition	Favour	Appreciation	Desirable	Acceptance	Credibility	Well received

Table 24. Cross–Case Comparison of *Observations of Appearance.*

The obvious barrier in this field of discussion is what is commonly called as 'absence of a common language'. The problem of different languages may actually be rooted in cultural differences. As one managing director said: 'The UK design process underperforms. They do not understand the language. They cannot understand it from their own cultural perspective. They do not understand *our thinking'*. In this case the lack of shared meaning may have come closer to the definition of the problem. The difficulty in being heard in the market clearly manifested itself in many ways, either as agreeing on the message or the output. As a chief designer said, 'I ask our UK marketing manager when he brings products independently, "Does the new product correspond with the *brand*"'. Or, to quote Adventurer's managing director on getting the right meaning to the market: 'We tend to confuse our customers, as much of the *media* attention is on our racing activities, leaving cruising in the shadow'. Or, as Guardian's division director said of conveying the message to receivers who are hard to reach: 'The top experts of the security authorities do not read commercials; they become convinced by testing themselves'. And,

as a sales manager said about a new product launch that failed to deliver: 'We have been poor in marketing, failing to *convince* our sales force and customers'. This last case also exemplified the problem that the message sometimes needs to pass a chain of receivers and senders. It demonstrates a vital aspect of difficulty controlling the message, as the actors along the chain may act as intermediaries forwarding the meaning, or as intermediaries reshaping the meaning of the message.

4.1.6 The Society and Science

Innovation is linked in this discussion to the broader environment and a deeper scientific perspective, compared to the ordinary economic business perspective. The societal and scientific category of discussion is assumed to be a force of the long–term conditions associated with the making and reception of an invention and the success of the firm. The empirical material contained a more detailed discussion, covering *movements in society,* imposed authorities in power, c*ultural movements* caused by citizens, a*cademic actors,* and their r*esearch discourse* and m*ode* of activity.

Observations: The movements in society appeared as two types, depending on the force of their origin. One was movements that were imposed by decisions of authorities. There was evidence of attention to movements in society in talk of legislation, privatization, monopoly, past Russian trade, state security, wars, the European Union project, local municipal and government policies, and IMS racing classification rules. The other type of discussion focused on movements in society brought forward on the initiative of individuals. There appears to be signs of cultural movements in such areas as fashion, arts, architecture, and technology. Destructive forces were also in play: terrorism, crime, SARS, AIDS, Pandemia, the aging population, and the passivity of youth. It is clear that every movement cannot be derived from individual or the authoritarian acts. But the leaders clearly did not exclude the movements from their concern, and they appeared to see either authoritarian or

individual causes behind the movements. They communicated, however silently, that the connection between the changing world and the faith of their firm was worthy of recognition.

A firm's interaction with the academic world was a common pattern for connecting to the emerging changes, deeper understanding, and development. The interviews yielded evidence of association to research discourses like technology, physics, mathematical sciences, medical sciences, social sciences, criminal sciences, and natural sciences. The interaction with the universities commonly took place with professors, researchers, doctoral students, and Master's students. The mode of knowledge creation appears to have occurred through scientific projects, research projects like doctoral and Master's theses, laboratory experiments, interview enquiries, and literature research.

In most of the discussions, the connection appeared to have been of academic character, and the trends introduced into the discussion supported the convictions of the spokesperson. Yet in one case, an interviewee from the Player made a causal claim about a connection between movements in society and a commercial breakthrough of the firm: 'In the seventies, volumes of apartments were built in Finland as a part of urbanization, but the living environment was disregarded, which was where we came in with our new theme of playgrounds'. A comparable discovery was seen in the Adventurer case: 'It was a time of breaking the classification rules of IMS and IRC, which has led to people fighting about the measures, why we saw an outright demand for a one design–class yacht. We saw that our competitor had also arrived at the same conclusion'. In both cases, the strength of the argument to recognize discontinuances of a larger setting had paid off.

Despite the subtle character of this discussion, one example of the rudimentary associations is visible in the statement of one of the key actors in one a firm located in a small rural town: 'Today you are expected not to argue for employment in the local community, or to argue that

the economy of the municipality goes bankrupt. It is totally irrelevant in a global economy with shareholder–value thinking. You could say "Away with all the hundreds of workers doing these products", with the distinct awareness that if they have no work, nor do I'. This statement probably explains a great deal of the critical ingredient of innovation—the persistence of entrepreneurship in many of the firms observed. A similar undertone, though not as explicit, could be traced in all the firms located in remote small towns.

Patterns of Observations: The general proposal was that the attention to the larger society and the association with the intellectual world and the domains of the universities were of minor concern to the key people in management. Only one of the six cases was an exception, where this category of discussion gained somewhat greater attention (see Table 25).

Player	Humanist	Plumber	Gardener	Guardian	Adventurer
M	L	L	L	L	L

Table 25. Cross–Case Comparison of *Category of Society and Science.*

Thus no particularly strong pattern of recognition can be established on the detailed level. As can be expected, there were gaps in the pattern of findings (see Table 26).

Society	Player	Humanist	Plumber	Gardener	Guardian	Adventurer
Cultural movement	Overweight youth	Arts Functionalism	AIDS, SARS	Small–town survival	Terrorism	Unfair competition in racing
Society movement	Urban building	Wartime, building boom	EU regulation	EU project	State security	Racing classifications
Research discourse	Physiology	Architecture Sociology	…	Geometric	Criminology	Molecular
Academics	Professors, students	Consultants	University	…	…	VTT
Mode of research	Post–graduate research	Investigation	Research	Literature	Investigation	…

Table 26. Cross–Case Comparison of *Significance of Observations of Society and Science.*

The barriers in this field commonly were seen to land in a hardship that was perceived to be larger than life—a general condition in which management felt insufficient to the task at hand. It may be something that occurred as a consequence of the doings of public authorities, to quote Guardian's managing director: 'User safety of products has caught increased attention, and hence, we are expecting *EU regulations*, introducing new standards, causing us headaches to interpret with local– and country–specific standards. It appears to be a question of prestige that every country has an approval practice of its own'. Alternatively, barriers materialized as a trend of sentiments among the consumers. To quote another managing director: 'The demand shifted from an ideal of durability to *slit–och–släng* [wear–and–tear] IKEA *phenomena*. When the successor of AA took the reigns when the *consumption pattern changed* and the cross–border *standing of Simon Storm* declined due to lack of spiritual successor, the firm withdrew to become Finland–oriented. It can clearly be seen in the firm of today; for instance, people barely speak anything but Finnish'. This example demonstrates a cause–and–effect reasoning,

where the 'change of climate' for business was one of the fundamental causes of what was seen to be the reason for undesired current state of the business. The phenomenon was introduced in parallel with other phenomenon occurring at the same time: the departure of the grand old man in the business setting. This may speak implicitly of the assumptions or expectations that this retiring person had the ability to adapt the firm to new circumstance. Raised in this way, the statement elevated parts of one of the vital roles of the key players of innovation and general business management.

Even though this category of discussion is subtle, there were ingredients that appeared to have a strong effect when the knowledge was introduced at the right time. The connection between the movements in society and the given condition, the actors said, was correlated with the discussion about the self–perception of the firm—one way in which the firm oriented itself in the environment.

4.1.7 The Partners

A partnership may be understood to be a 'relationship between two people, organizations, or countries that work together regularly' (Longman, 1995). This section reports on the discussions addressing those *external participants* who contributed to the solutions shaping the invention. Some partners may have had a crucial position in the discussion about the invention; others may have been peripherally engaged in the R&D process, exercising critical expert influence on the shaping of the invention. Ordinary suppliers who make no particular intellectual contribution were not within this peer group; they belong to the later discussion on purchasing.

On a more detailed level, the empirical material addressed the identification of actors with *strategic interests*, a different type of *role definition* that positioned the partner in the make–or–buy constellation, the matter of network *proximity*, and discussions about practical *routines* of the cooperation.

Observations: The partnership category of discussion in the

organization appeared to span a wide range of perceptions of who is a partner. There seemed to be some level of ambiguity over who is a partner and who is an ordinary supplier. A more superficial *make–or–buy role* designated to the partner received labels like subcontractor, low–cost manufacturer, spin–off manufacturer, outsourcing actor, contract supplier, machine supplier, or tool supplier. In this discussion, there appeared to be in a trade–off between making it oneself or buying it, where cost efficiency appeared to be one of the prime criteria of the firm. The topic of deliverables was addressed in this discussion in terms of a specifically known deliverable when the order was placed. Furthermore, as significant cost efficiency was of prime concern, the deliverables tended to be focused on those of significant value or volume. In this discussion, the leader commonly appeared to reason that the firm itself had some capability of ruling over the production of the deliverable. The decision to delegate the responsibility of a deliverable to an external contracting party also appeared to be a matter of logistical division of labor.

A particular partner with a strategic *expert position* emerged from the discussion. In the Guardian case there is a Swiss partner—a partner with a specific and core engineering skill. The partner provided technological solutions with a critical contribution to the security feature of the locks. If the Swiss partner had been erased from the setting of creativity, it would have had severe implications on the firm's ability to deliver critical qualities of the product. The partner was acting in both the lock and the watch market, where skills to master extreme engineering tolerance gave the Swiss partner a competitive edge.

In half of the cases, there appeared to be a higher degree of integration with a certain partner in the product development sector (a partner is treated as an equal person). The case firms appeared to have given a larger portion of their destiny to these partners, compared to those make–or–buy partners described previously. At most, these partners were masters of concept design, where the conceptual idea was at the heart of the product. Following are three examples of such partnerships:

> In the Adventurer case, there was a chief naval architect tradition since the beginning of the company. Over the past thirty years, the firm had three chief naval architects: Smith and Jones in the USA, Adrian Heigho from the United Kingdom, and George Beawer from South America for the past two decades. The cooperation that existed at the time of the study had a permanent character, and the setting delivered new products.
>
> In the Plumber case, cooperation has existed over the previous two decades with an independent industrial designer, Edward Design, and over the previous five years with a southern European, Archie Angel. A similar consortium existed in the Adventurer case; it appeared to be a coalition of like–minded actors around the bathroom interior design, configured by Archie Angel. This arrangement delivered new products to the market.
>
> A review of Humanist Company's history revealed some arrangements comparable to those in the Adventurer case. At the interception of the firm, a cooperation with the chief architect, Simon Storm, was at the center of the organization's creativity, yet not as an employee of the firm, but as a closely associated chief architect. A comparable arrangement had been in effect with a UK designer, Jim Fix, over the preceding five years. This arrangement had not yet yielded a distinct track record of major new product launches.

Partners can also be in a *supporting expert position* in an invention project. To quote a project manager: 'The outsiders bring to the table qualified alternative considerations, which they are not shy to express, contributing with valuable criticisms, beyond their professional skills and way of thinking that refines our own ideas'. Adventurer Company had several yachting–oriented experts: Neil Hardy, a racing boat builder expert who knew the art of reducing weight from the structures of the yacht; and Clayton Paul, a racing skipper who contributed with user experience racing round the world. Guardian company had similar experts:

government experts in criminology, sharing experience and skills in the development and trial of new security solutions.

It appears that the two extremes—the make–or–buy partnership and the master partnerships –differ greatly. Most striking is the difference in the time horizon of the cooperation; the make–or–buy partnership was associated with competitive tenders, whereas the longer–term cooperation was a starting point for collaboration. Another was the dynamic and enduring frame of reference in the creative process of the firm.

The proximity between the sites of activity of the collaborators was particularly noted in the interviews. *Physical proximity* dominated the discussions; a starting point in thinking of the distance was the concern about the activity moving off–site from the company's factory. At first the traditional thinking of 'how to control the factory' was relaxed. The next level of distance appeared, as the partner was located in the neighborhood, to usually be on the site next to the company's factory. The interpretation of *local* usually meant the village or town where the firm's operations are located. Another dimension of the discussion about mental proximity raised thinking about *organizational proximity*. In this instance, discussions occurred about networks, alliances, and groups of companies. The scope of the partnership appeared to be dynamic. Leaders clearly communicated an ongoing debate about the borderlines of the partners' territories.

The discussions also focused on the *practicalities*, where the traditional factory mentality was the base reference of thinking. The subject triggered discussions about new needs of specifying the deliverable, introduced new discussions about lead times, new practices for receiving offers and making orders, new measures for auditing the quality of the delivery, and practices for approving the invoices. The change brought contractual steering of interfaces previously guided by past practices, in the making of a new division of responsibility between the firm and the partners.

Patterns of Observations: The attention on this category of discussion about partners was on an equal—average—level compared with the previous discussion (see Table 27). There were extremes, however. One firm communicated a strategy to be self–sufficient on what it calls areas of strategic competence. In another case in which the partnership model had been applied for centuries, the same strategic competence is delegated to an highly respected partner George Beawer. It shows that same reasoning, when it comes to core competence in association to partnership, can sometimes lead to different conclusions.

Player	Humanist	Plumber	Gardener	Guardian	Adventurer
L	M	M	M	M	M

Table 27. Cross–Case Comparison of Significance of *Category of Partners.*

In a detailed consideration (see Table 28) of the discussion of partners, the three firms that applied a distinct strategic partner model also concentrated significant attention to this subject. One could say, in fact, that the strategic partners were clearly present in the minds of the interviewees, through their close association to the delivery process. This does not mean, however, that they were all successful in this play. In cases in which there was no such participant, the subject appeared to be of peripheral interest.

Partners	Player	Humanist	Plumber	Gardener	Guardian	Adventurer
Aligned	TEKES	Jum Fix,	Angel, Edward Design	ABB Automation	Secret service, a Swiss high–tech firm, a tool maker	Sepulveda, Smith & Jones
Proximity	Organization networks	(Ideological) Closeness	Alliance, connections	Chain of contacts Distance	Trust	Knowledge network
Practicality	Lead times	Agreement	Agreement	Control	Inherited knowledge	Long–term co–operation
Role sort	Component subcontracting	Specialist, sourcing	Design, outsourcing	Subcontracting	Experts	Design, component sub–contracting

Table 28. Cross–Case Comparison of *Observations of Partners.*

A common finding among the partnership barriers was a matter relating to the people involved: critical people leaving the scene. The more critical the key person, the bigger the gap. As a managing director said, 'The succession after Simon Storm passed away has not been successful'. As partners are of a different organization, there is friction with the process of substituting a vital resource.

Another aspect of the same borderline problem was seen in the tendency not to share vital information for the cooperation. To quote another managing director: 'Jealousy of people is a big challenge in integrating our own and *outside competencies'*. As the day–to–day operation generally relied on participants at many different levels, a united voice in the cooperation with 'external' was left to the discretion of each individual involved. On one hand, it is not seen as legitimate by customers to leave the responsibility of the firm in the hands of others, as one chief designer said: 'A German customer protested against quality guarantee when the domestic manufacturer was to be replaced by a *Chinese subcontractor*'. The statement spoke of confidence and limits of confidence as a critical factor. On the other hand, it seemed sometimes to work in the opposite

direction when stalling barriers had to come down: 'Barriers come down for us, when our things become associated through *Archie Angel* with arts and design', as Plumber's managing director said. It demonstrated that the partner might also have filled the gaps of confidence. If the people aspect was one visible aspect in the discussion about the partnership, then the technical aspect was the other. When problem solving was distanced from the firm's turf, the leaders had to rely on the capabilities of others to solve their never–solved–before problems. It did not guarantee the solution, however. To quote Guardian's project manager, 'It was hard to find a partner producing key grinding machines, due to severe technological *requirements'*. And once a match of the required competencies had been found, the leader ran into the problem of the organization not being prepared for the mode of cooperation with the partner. 'We have some kind of item specifications to ask for offers, but our drawings and instructions are not yet detailed enough to *subcontract* on larger scale', said another managing director. Logically, the cooperation of partnership is joining many loose ends together, which, in the beginning, requires the patience of organizing the details and the time for practices to settle. Then the fruits of partnership may be fully grown.

4.1.8 The Mediators

The mediators are external actors who facilitate, block, or reshape the meaning of or opinion about the invention. The mediator does not merely forward the meaning as received. Mediators may contribute to the substance of the innovation or merely to the perception of it. Still, they are *not* in the role of a buyer of the product and they do not sit around the table where product development is being discussed. The mediators are found in the role of the receiver, but also as the sender of a meaning to the firm. The discussion during our interviews revealed who these agents were and how they made themselves known.

The association with those *agents* who formulated opinion appeared to have been a special relationship in every case. Talk about this relationship was discreet, and the agents were treated with respect, partly because of their power in attracting public attention and partly because of their valuable wisdom. Some agents actually shaped the product, whereas others merely influenced the perception of the product. Both these factors were present in the expression, 'The cooperation with Archie Angel has improved our acceptance and awareness. With his connections, he makes us presentable in design circles where we had not made it alone'. It is evident in this case of Plumber, that the actors influenced the design with their skills and the image of the novel product, because of the media attention to these personalities. The shallower mode of interaction was seen when only an opinion was in play. To quote an interviewee from Humanist: 'The editors were thrilled; they saw new products. It was like they had waited to be able to tell about the new coming of Humanist Company'. This statement indicated that there was a general expectation in the company that had yet to be fulfilled. The editors appeared to be the determiners of a development happening or not happening, and they shaped the common perception of the firm's product range.

The concern of mediators goes beyond those who create community opinion; it extends to *how to be seen*. The media and the way of conveying the message was a topic of discussion. As a chief designer at Gardener said: 'We smuggle our cutter discreetly into gardening TV programs, where a famous gardener is hosting the program. When he demonstrates the product, it gives us tremendous *TV visibility'*. The selected program host, it was assumed, would portray an independent judge of the product.

Two limitations were raised: the limited time of impact and the limited control. 'The races continuously generate *editorials* and free *publicity*, all of which fuels our brand. A launch of a new yacht model gives *publicity* in the yachting press, but that only lasts for awhile', continued the chief designer. Once it had been passed to the mediator, the firm could no longer control the message. The host or the editors could present

an adverse opinion, for example. But that risk was compensated by the improved credibility of the host's testimonial. Courtesy appeared to be the accepted manner of communication in this field, therefore, as the message went from mouth to mouth purely at the discretion of the actor.

Because of the long chain of reshaping the meaning, the term *mediator* is seen here as being more appropriate than the expression of opinion leaders. There is a large overlap in the two terms, yet the label of opinion leader assumes that one actor would be in control of the transmission of meaning.

Patterns of Observations: Of all the interview discussions categorized, the discussion about the mediators is the only one that received little attention across all the cases studied (see Table 29). Despite the peripheral attention to this category of discussion, it was recognized in the structure of this report, as it was valuable to position the opinion leader in the landscape of the leaders.

Player	Humanist	Plumber	Gardener	Guardian	Adventurer
M	M	M	M	M	M

Table 29. Cross–Case Comparison of Significance of *Category of Mediators.*

The mediators were more often talked about in terms of the person, and less often in terms of the mediator's influence in the reshaping of meaning (see Table 30).

Mediators	Player	Humanist	Plumber	Gardener	Guardian	Adventurer
Opinion creators	Teachers Landscape architect Facility manager	Culture VIP Fellow designers and architects	Design establishment Interior architects Officials	Celebrity and profess. gardeners President's gardener	Government security officials Insurance companies	Skippers, professional sailors Personalities, close friends of Adventurer Exclusive club
Opinion	…	Expectations	Interior press	Photographs	Credentials	Their minds

Table 30. Cross–Case Comparison of *Observations of Mediators.*

One hurdle associated with the mediators of a meaning was the ability to recognize and understand the organization's incoming impulses. To quote a technical director: 'When we read the speech about *Margaret Thatcher's vision*—that the micro chip would revolutionize our lives—it was hard for us to imagine that the chip would also be in our products one today. Now it is'. In this case, Thatcher's words mediated a meaning by those who later integrated the chip into a faucet.

Another aspect of the same barrier is seen when 'the same language' does not exist between the individual of the environment and the individual of the firm. As a managing director said, 'Very *experienced customers* gladly give us their advice on how to improve the product, but it requires new communication skills of our own people'.

The leaders discussed another, opposite barrier associated with the mediators that was primarily associated with the difficulty in controlling the message, or even getting it through. As a project manager put it: 'The *officials in the education world* are hard to come by, but their recommendation is essential for us to enter local schools'. And when the message did get through, it did not land unfavorably, but also was misinterpreted, as a managing director mentioned: 'George Gray claimed that we brought a *hybrid product*, to market that was far from complete and not Humanist Company quality. And they were right'. Or the chain of the

communication stopped halfway, because of limiting rules of the game, like good manners. To quote Gardener's managing director: 'We have a good cooperation with *the gardener of the presidential summer palace*, but we cannot publicly refer to this'. The transmission between the sender and a mediating receiver is only a simplification of the phenomenon of opinion shaping. As one division director said, 'The *inner circle of security spheres* is very narrow, and its members tend to give *recommendations* to each other'. It goes to show that there is probably a village, a large set of connections, or a network of contacts behind many mediators. To some extent, all of these mediators tended to reformulate the meaning along the chain.

4.1.9 The Customer

The intermediate customers were relatives of the mediating opinion leaders. They had limited force to influence the shaping of the invention. In rare cases, however, customers were also able to assume the role of mediator. They were buyers, and had a particular intention in selling forward the products with commercial interest. They held the position on behalf of their paying clients to block the diffusion of the flawed innovations. They could also choose to be a sponsor of efforts to facilitate the reception of the invention. Contrary to the mediating opinion leaders, their position possessed a veto right. The category of discussion highlighted the innovation purely as it would be seen from the customer's perspective, and directly related to customer satisfaction. To some extent, this category of discussion was distorted by the fact that the term 'customer' was used on the assumption that the customer is equal to the *user*. Also the term *buyer* is close to the meaning of the user and the customer. The vocabulary in each company differed, as the firms had different relationships and structures of contact with the market. It is clear, therefore, that the discussion about who is the customer was far from definite. The observations related to the competition and competitors is in the end brought up as a sub–section to the Customer category, as it is

evident that the relationship with the customer is not seen isolated from other contenders.

The customers were addressed in greater detail in terms of *general distribution*, the paying *client businesses, the individuals* playing the role, the trigger of the purchasing process of the customer, and the *deliverables* that the customer received. On the highest level of abstraction, the customer was considered to be a channel of *distribution*: 'We have a three–level distribution system; we sell to wholesalers, and they sell to plumbers', to quote Plumber's marketing director. The customer was actually segmented into groups of similar customers. The thinking was oriented more toward administrative needs.

The discussion became more operational when the paying *client businesses* came to a leader's attention. As Guardian's managing director mentioned: 'The locksmith shops are a Scandinavian phenomenon. In central Europe, our products are available in *hardware stores*. But professional end users also have their *own security organizations* and their own installation practices'. The discussion about the client appeared to be a mixture of talk about the business and/or the individual who represented that business. In the latter instance, the attention moved closer to fulfilling somebody's need: 'It is Mr. Walter Heigh, the commodore of the yacht club, who has the final say on how they want the Miami One Design Exodus yacht model specified'.

When the discussion alluded to the needs of customers, attention was more specifically focused on what they wanted and what they actually perceived to have been delivered. In other words, the discussion was elaborating upon client needs and expectations, and the availability of prospective solutions. To quote Guardian's managing director, 'The situation was that we were looking for a solution to what we saw there was a *need* for. The *need* was purely coming from our customers. The terrorist attacks even increased the need. We were solving the problem that occurs when a key gets lost, and the reliability of the security system is lost'.

At this stage of the discussion, the client problem was basically known, but what was to be delivered was not definite. The deliverables are concrete things that the client came across: order, delivery, installation, invoicing, payment, guarantee, maintenance, and warranty. These elements of this discussion were the substance for defining the competitive advantage of the firm: 'If we want to stand out, design is not enough. When an architect talks about us, it is with praise. Yes, our top southern Europe design, the Plumber quality, and our reliable deliveries', applauded Plumber's managing director. As this example demonstrates, the definition of what to be invented needs creativity and needs to be adapted to the situation of the firm. Commonly seen generic schoolbook statements fall short of relevant meaning.

It became clear that there were *competing players* in the market. The competitors introduced restrictions that were subject to such variables as time, product configuration, pricing, and availability. It became evident that it was not enough to have an innovative product. Solutions were copied. Attention is drawn to matters like the competitive position of being first on the market, having a distinctive product technology or superior know–how, or having negotiation power. The discussions about competition focused on head–to–head competition with suppliers of the same article. There was also ideological competition, in which mental positioning of the product served as the battlefield. 'When IKEA entered the market, it brought along a wear–and–tear consumption culture, at the expense of the consumption of quality products' said one leader. Competition in the form of internal competition hit some of these firms even before the product reached the market. As one production manager said: 'We didn't want to outclass our fellow European office to gain market share. Internal competition is not always wise. But if it brings better designs, technical substance, and other benefits it's good'.

Patterns of Observations: The category of discussion about the customer did not usually stand out. Nor was it neglected; it received average attention. The pattern was consistent across the cases, with one

exception (see Table 31).

Player	Humanist	Plumber	Gardener	Guardian	Adventurer
M	M	M	L	M	M

Table 31. Cross–Case Comparison of Significance of *Category of Customers.*

During the detailed discussion (Table 32), the customer was spoken of in a consistent manner, in terms of distribution, clients, key persons, and deliverables. Only in the Adventurer case was there little discussion about distribution and client businesses, probably reflecting the fact that the company has a few private customers.

Customer	Player	Humanist	Plumber	Gardener	Guardian	Adventurer
Distribution	Public sector	Wholesale	Three level; wholesale	Garden distribution	B–to–B	…
Clients	Municipality	Shops Dealers	Hardware store	Hardware store Inter –company	Lock dealers	…
Key person	Bureaucrat, Contractor	Shop keeper	Pro/private plumber	Vendors sales mgrs	Locksmith	Owner Skipper Nominees of owner
Deliverables	Installation	Training	Quality guarantee	Complaint response	Replacement	Proven technology solutions
Competition	Metal products	IKEA ideology consumption	Low cost taps, technology	Group companies	Technology, reliability	Technology, design, price

Table 32. Cross–Case Comparison of *Observations of Customers.*

During our interviews, the customer was both elevated to the skies ('the customer is most important for us') and degraded to the level of 'the difficult customer'. *Barriers* often included demands that the organization

was not interested in or prepared to meet. Something along the lines of 'the diversity of *customization* is difficult to *manage*' was heard in most firms. More specifically, there may have been challenging technical requirements on the invention: 'A demanding *customer* is where there are many keys in circulation, many doors to be locked, where the *wear and tear* on the locks is big', as Guardian's project manager said. Alternatively, the customer may have used the product for different purposes than the firm intended. To quote a production manager: 'Some of our customers demand *painted park bench* installations into odd places. This creates a need to repaint the benches one year later'. Similarly, the ambiguity involved in being seduced by the customer into new fields may open major fields where experience and competence may be inadequate. As Adventurer's managing director said, 'Customers appoint their *own project managers* for their yachts, and we are entering into an field that we are not accustomed to'. However, the same mismatch between client need and the product firm served as the fuel for creativity in some parts of the organization: 'The *customers* are complaining, for instance, about *not reaching high* enough when working in the garden, and they pose the question, "Could you not come up with something?" '.

In dealing with the unknown of innovations, it is probably not realistic to assume a clear–cut dialogue between the client and the firm. It would be like assuming that feedback has no function in the proposal of a novel product to the customer. Statements, like that of a technical director, demonstrated that certain customers have a unique role to play in the diffusion of an innovation: 'We made *trial assemblies* with some of our *customers* to prevent technical problems from arising when the sales began full scale'. Here the discussion evidently related to the parallel discussion about the user, and particularly for the subjects associated with the *first user*. If the first user was not equal to the first customer, the user and the buyer were likely to have been closely affiliated.

The instant signal of the constraints by *competition* was sensed in *price* competition; but in terms of innovation, the competition appeared to

be competition among *concepts*. To quote one interviewee: 'The consumer demand shifted toward cheap wear–and–tear mentality. When IKEA came, it promoted sales of piece goods, integrated in a visual environment. Their warehouses sold what Humanist Company used to sell: living spaces'. The competitor's better concept disrupted the position of the firms on the market. Apart from the example of the competition being better at reading shifts in consumer demand, the *disruption* of the firm may also have come through technological supply challenges. As one leader said: 'We have an urgent need for the domestic market to find a new solution to replace the patent that will be expiring in 2013. That is not far away, bearing in mind the lead time for new inventions'.

Summary and Connection to Theory

When comparing observations from the categories related to the discussion about the external rulers, the internal systemic–driven, and internal individual motivation–driven observations, the leaders devoted the least attention to the external rulers addressed in this section. In the External Rulers discussion, the evidence and knowledge starting from the user, the use, the location of use, the ambient society, the product, and its appearance were addressed, followed by the external actors related to the firm and innovation: the partners, the mediators, and the customers. Common to all contingencies is the fact that they are not in control, and the firm does not likely influence them. In some categories of discussion, there were inconsistencies in the level of attention paid to each discussion in the various cases. Furthermore, there were differences on the detailed level on the emphasis of the various properties describing each category of discussion. When considering all cases combined, however, with one exception, the key innovators in the organization modestly recognized this domain of discussion consistently across categories. The only outstanding category of this discussion with the leaders in this domain is the one about the material or immaterial product delivered by the firm. The product

was classified as an external factor, mirroring the fact that its fate was not internal, but was externally decided by the audience of the firm.

In the most general terms, this domain refers to what in theory is commonly called the *environment* of the company. The assumption in the Theory of the Firm is that efficient management requires insights into the probable behavior of such decision–making systems as customers, suppliers, governmental regulatory bodies, and labor unions (Cyert, March, 1963). Compared to that definition, the empirical classification of this study elevated further knowledge related to the use, the location of use, the product, and its appearance as an integral part of the environment of the firm. Cyert and March's suggestion has connections with Shane's (2003) entrepreneurial theory, in which references are made to opportunity recognition relating changes in socio–cultural, political and regulatory, and economic aspects of the environment. The empirical observations related to Cyert and March, as well as the Shane proposal, are found among the external rulers under the topic Society and Science. In this study, however, this category ranks as insignificant—an area to which little attention was paid. Thus movements imposed by decisions of authorities, called Movements in society, and movement originated by citizens and groups of citizens, or Cultural Movement, are seldom mentioned, contrary to the two theoretical proposals.

The discussions in this domain can be seen as a more specific qualitative description of a stable or an instable environment of the firm. The external stability aspect is vital in the theory of innovation management, in order to be properly organized in conformity with the prevailing environment. If, for instance, a mechanistic approach to management were to be applied in an environment in which new rules are created by the competition for new products and the way they are brought to the market, it is evident that the management system of the firm would not correspond with the requirements coming from the environment of the firm. Other examples of destabilization in the environment are natural changes, accidents, and shifts in consumer behavior. The discussion

about the external rulers is also closely connected to the behavioral theory of the firm,—a theory in which the *general purpose* of the firm is a rational definition of the output and consequential profit seeking. As Bernard (1938) pointed out, the challenge is to reduce the whole mass of everything surrounding us to a meaningful conclusion specific to a particular firm. In the event that the purpose of the organization has been defined and stabilized, he notes, the purpose refers more specifically, not to the discussion about external rulers, but to internal domains of discussion and organization theory. Up to that point, however, when the purpose is not yet settled, the discussion is regarded more as an integral part of externally oriented entrepreneurial theory. The dynamic interpretation of the purpose of the firm will later in this book prove to be one of the key issues brought up by the leaders of innovative firms.

The empirical and theoretical comparison is further addressed and discussed in Part 5: Analysis.

4.2 Individual Motivation Driven Internal Factors

In contrast to external issues, the theme of internally related observations addresses matters predominantly connected to the general internal affairs of the company. From the perspective of the leader who must manage the innovation activity, these internal matters are not necessarily easier to control than the external conditions are. Two related internal factors clearly emerged when I listened to the leaders discussing these matters. There appeared to be a fine balance between the *individual motivation–driven* and the *systemic rational drivers* of innovation inside the firm.

The reflective *individual motivation–driven internal* aspects of innovation are the key *persons* who are the company's innovators, *the conditions* under which the firm and these persons operate, the *decision making*, the *invention* of new things, the *spirit* that intuitively unites the innovating community, the firm's *practices and arrangements* that facilitate recurring innovation,

and the *skills and learning* that contribute to the evolution of innovations. After the description of the motivation–driven factors, the systemic aspects factors are discussed in the same way.

4.2.1 The Leadership Preconditions

The leaders interviewed debated the general *overriding* conditions that made or broke the inventions in their companies. Although leadership conditions were primarily addressed as internal matters, it was clear from the leaders' comments that there was no distinct line between internal and external conditions. The discussion addressing the *given* conditions dealing with such matters as location and industry, for instance, were closely connected to the outside world. The *inherent* conditions like history, traditions, and culture were more closely associated with the firm's internal domain. The discussion about the firm's *self–perception* reflected how the leaders perceived the ethos of the organization. Their self–perceptions, I presume, had an impact on collective behavior within their firms, particularly when the individual distinguished between the right and wrong missions of the company. The discussion about the *establishment* focused on the upper hierarchy—the owners and the board—and on their influence of the firm's leadership in general. Thus the senior managers talked not only about themselves during the interviews; they also included the owners and representatives of the owners in the discussion about leadership. Furthermore, the discussion mirrored the perception of the *prevailing situation* of the firm, which reflected an understanding of the business context and the strengths and weaknesses under which the firm operated and was being led. The *direction of strategy* discussion followed a discussion of matters like the chosen definition of the mission, the leading ideas, and the particular business idea to which the organization aspired. Finally the *strategic steering* discussion involved an understanding of priorities and boundaries associated with keeping the execution of the strategy on track.

The *given conditions* of leadership received a great deal of attention during the interviews. These conditions are not unchallengable, but one could ask how sensible it is to challenge them. In any case, the given conditions were seen as fundamental matters related to the geographical setting of the firm. As one managing director said: 'The choice of material for our products has created lively debate. The discussion about the use of wood material was particularly emotional. This is understandable, given that the firm's location here in this particular city renders it dependent on wood. If wood were not used as a material in our product today, it would dramatically shift the setting of this business'. The decision to employ wood as the primary material in our product restricts or sets a boundary on the firm's location and limits the choices of activities in which the firm engages.

The *inherent conditions* were another dimension that predetermined certain business matters. The firm's history appeared to influence the present and the future. As one Adventurer executive said: 'We build a yacht only when we believe the idea is viable, in the sense that it will not compromise our heritage'. Factors such as traditions, heritage, and culture appeared to restrict management to honor the past. To some degree, this restriction was a self–imposed internal–to–the–organization limitation, but traditions and history were usually regarded as belonging to the public as well. In that respect, public opinion came into play as a restriction.

Another type of self–imposed constrain was the *self–perception* of the organization. To some extent, the self–perception of an organization is rigid and slow to change, simply because of the number of people who have different perceptions or interpretations of the ethos of the firm. As one production manager said, 'I think we are an innovative user of wood, and that is why we are also successful'. Similarly, a collegue of the production manger said, 'We have defined that we are a playground equipment manufacturing company'. The statements were not necessarily in conflict, but when it came to the top priority of the firm, the interpretations could have led to different conclusions. The first would, for instance,

neglect metal as a substitute for wood as a building material for the product, whereas the second may have promoted metal. The interpretation of the self–perception can also be dynamic, however, and can change with the speed of a thought when future aspirations are added to the discussion: 'Humanist Company is today an intermediary of furniture, but we should be a living space company', the managing director explained. Clearly that self–perception had present and future interpretations. The present perception was an anchor to the past, whereas the future was motivation–driven and flexible. If the good self–perception was to serve as a unifying force, then the organization was probably not too well off if every individual had and promoted a personal perception.

The interpretation of self–perception is, without a doubt, a function of and dependent upon the popular view of the *situation of the firm*: 'The struggle for survival has been a driving force. It has produced the attitude of "Damn, we'll show them!" It has been healthy, because we have never been in a position to say, "It's done".', said the managing director of Gardner. That struggle generated a revolution in the ethos of the firm from a scissor company to a garden company. There is plenty of evidence that it made a dramatic difference in the type of products invented.

The establishment influence operates indirectly. Assuming that authority and the establishment are connected, making the final decision on priority setting is a contribution of the establishment. The role of the owner, for instance, is subtle most of the time, but when the top priorities of the firm come into question, the owner has the final say. Likewise, the MD, the management team, and the line directors play an influential role in implementing the organization's priorities on a day–to–day basis. The enthusiasm of owners and managers tend to vary when innovative ventures continue for years; there is a need therefore for them to maintain a belief in the undertaking. 'In a company like this, the owner and top management, should be encouraging and keeping up faith in strategic projects', said one managing director.

A more distinct contribution of the senior management, or establishment, is to provide the organization with a sense of direction. In a stagnant situation, this task is of lesser importance, as the old interpretation holds; but in a situation of change, the direction is needed to keep the organization focused. In the Humanist Company, for example, the current ethos is that of 'a furniture company', but the firm clearly faces change, given that the CEO makes statements like: 'I will take the firm into the context of marketing arts; when you buy our furniture, you buy yourself a piece of art'. Although sticking to furniture product lines was nothing new for this firm, its positioning in the minds of the buyer changed and became distinct.

Once the strategic direction was known, the focus shifted to achieving the firm's ambition by steering it toward that strategic destination. On one hand, there seemed to be a high degree of freedom associated with innovation. This freedom came at a cost, however; there were high expectations built into the performance evaluation system. To quote one interviewee: 'We have been granted freedom when we deliver profit and maintain our confidence'. Another view on the monitoring took place through influence on the planning process. As the managing director of firm said,'Every business unit has a strategic road map of its own. The road maps are updated every fourth year'. There were those who relied merely on results, and those who, in addition to viewing the results, engaged in choices made to achieve those results. A different aspect on reaching the destination brings into discussion the *style* of leadership. As one of the MD's subordinates said, 'It is like when my boss granted me a sum for an investment for the first time. It didn't take me a split second to understand that I was expected to deliver. If I didn't, the future backing would end. We have been far from an obedience–oriented firm; we've had the freedom to take action. Yet, we have always delivered'. This statement underlined the point that freedom is an illusion that diminishes upon accepting the full responsibility for fulfilling expectations.

Patterns of Observations: The category of discussion related to preconditions of leadership was one of the five liveliest discussions. As indicated in Table 33, concern for leadership conditions received significant attention across all but one case.

Player	Humanist	Plumber	Gardener	Guardian	Adventurer
M	S	S	S	S	S

Table 33. Cross–Case Comparison of Significance of *Category of Leadership Preconditions*.

In the deviant Player case, preconditions received consistently less attention across all the subjects addressed in the conditions theme. On the detailed level (Table 34), the subject of self–perception stands out as significantly attended to in all the five cases where this category of discussion was predominant. Surprisingly, the strategic direction addressing new horizons was least recognized among the subjects recorded. The reason for this finding may be found in the fact that the direction of a mature set of managers is either self–evident or does not often arise as a subject for discussion often.

Conditions	Player	Humanist	Plumber	Gardener	Guardian	Adventurer
Given	Firm northern location, municipalities	Central European design office	Industry standards	Illinois – Poland – Furunas	State security norms	Experimenting activity in the industry/LB
Inherent	Tradition deciding	Cultural differences	Gas station syndrome	Work culture adapted to Oscar	Embassy locking tradition	Firm heritage of product quality
Self–perception	Innovative user of wood, playground creator	Furniture firm, living space firm	Faucet firm, volume biz, small internationally	Garden company	Walk–through–the–door–firm, lock firm	Builder of ocean–going and feel–good performance yachts
Situation	Two worlds of mentality	Dormant state, breakage	Temporal state of chaos	Fight for survival	Erosion of lock security	'We are not user of our own product'
Establishment	Owner, teams of management	Owner, management foundation	Owner, core team, mgmt team	US chief, US board, domestic board	Parent company, management team, business units,	Italian owner, Florence office, local management, customer
Strategic direction	Focus on play, not park	Arts in marketing context	Strategic Russia	Local employment – shareholder value Scissor to garden	Door technology	Racing or cruising
Strategic steering	Product design line	Connections *the* thing	Business idea thinking	Meet financial targets	20–year patent cycles	A little behind the real innovator and relationship with the customer

Table 34. Cross–Case Comparison of *Observations of Leadership Preconditions.*

The barriers in this field dealt with matters fundamental to the character of the firm. Attention was first drawn to the top managers' crowded calendars, particularly to the fact that innovation was not the only thing sitting around the corporate table. To quote one of the managing directors, 'Thinking of ordinary *company leadership*, operational investments like offices, new factory layouts, etc., all competes for the same resources that are needed for innovations. Everyday matters of leadership compete with

invention'. One reason for a lack of success in innovation, then, apparently stems from the simple fact that too few resources and too little time were allocated to innovation. Another reason was suggested by one of the managers: 'It is a known that it is not liked, because the company leaders like order; they like to be in control—to know where their players are and trust that there are no surprises. Even a small proportion of disobedience is uncomfortable for them. There is an obsession for order, the managers firmly advocate that they want creativity and new things, but deep down they want order. Creativity is always subordinate to order'. As soon as there were two or more expressions of what was expected of the firm, dependencies between the expectations became an obstacle. As the saying goes, there are two things demanded in business organizations—creativity and control—and at the end of the day the default will always be stability and control. As the tension between directions increased, the situation started to consume the activists. As one leader explained, 'Now, looking at it; it has always been tough to have to fight the US management with own agendas and short sightedness'. Even successful constellations run the risk of coming to an end when the grand old men retire, as the managing director in charge explained: 'We are moving from entrepreneurialism toward a more managerial organization culture, since Andrew left'. As the team changed, the setting of the entire constellation faced a review. As seen in Part 2: Thoeries, when the change from an entrepreneurial culture to a managerial culture occurs something close to a reshuffling of the entire power structure emerges. If the succeeding organization cannot replace the activists of yesterday, the whole culture of innovation may be lost. As the organization strives by default for stability, the culture of control may strengthen, and the firm may lose the courage to try, to make mistakes, and to adapt to changes in the environment. To quote one executive, 'The principle of "preserve and monitor the inheritance" has stagnated development'. The culture—in terms of collective memory—may be why one of the case firms had had difficulty making innovation happen. In the end, those who owned the firm called the shots. The extension of scope

from 'senior management' to establishment is vital, therefore. Like any force, it may be productive or it may be counterproductive in innovation. It is counterproductive if it introduces unpredictability and insecurity. As a manager in a family business explained, 'In a company in which the owners' family is present in the firm's organization, I have to balance the organizational measures accordingly, in order to keep my position'. As most of the sample firms of this study were located in rural areas, pressures from the world outside were commonly seen as negative. If the leaders were capable of dealing with difficult situations, however, the problems could be turned into a driver of energy. As one such leader said, 'An emotional bond to the local community makes it worth fighting for the future of the factory and the jobs'. This statement serves as an example of how a barrier may have the face of a problem from one perspective, but the substance of a driver from another.

4.2.2 The Activists

Although a handful of people serve as the driving force behind inventions, it is clear that the number of participants is larger. For most of the actors, participation appeared to happen as part of their ordinary duties. Breaking the frame, however, required some actors to exert an extraordinary effort at the borderline of what was perceived in the organization to be rational and acceptable.

The attention in the discussion about the actors focused primarily on the key *activist characters* and on the *collectives* of different kinds. Those involved were also frequently referred to by their *formal position* and rank. There was some concern over *age* and *partial engagements*—matters raised in association with organizational transition.

The labeling of the *activist characters* varied from case to case, reflecting a difference in vocabulary across the cases. It also reflected a difference in meaning when discussing the substance of the role. When one applies the theory of promotors, however, a pattern of the activists appears. The roles

are not definite; one can assume a different role from time to time or may not meet all the criteria of a role. The following is an illustration of the most predominant roles that occurred in the sample.

There appeared to be a role that exemplified the *highest authority* in the project. The highest authority was characterized as the owner, the businessperson, the investor, the financier, the spiritual leader, the superior decision maker, the protector, and the godparent. The highest authority is not necessarily the person with the highest formal rank. There may have been people with higher rank in the firm who were not engaged in the project. There may have been persons of lower rank who did not have high personal influence. As one such person of high authority put it: 'When we go for it, I look after finding the funds. Nobody else is to be blamed if it fails. I am responsible, and I do not delegate this responsibility. I, personally, take the risk. They have seen me in the heat. They trust me in this sense. It removes any concern of losing the job for stupid things'. Over the years, through good and bad experiences, the level of confidence and trust increase. Respect released energy. The highest authority provided resources, protection, and priorities, and set the expectations on results.

A close companion and ally of the highest authority in this sample appeared to be a product–oriented and technically oriented *master of ideas*. The master of ideas was variously called the inventor, the idea person, the mediator of ideas, the engineer, the technocrat, or the chief designer. As the master of ideas at Gardener Company said, however, a person who identified the technological problems and spotted opportunities to bring the development forward: 'Here is a cutter with interlocking cogs, for instance. We're now developing cycloid cogs and the method to manufacture them. They make the tool less sensitive to wear and tear. The idea is two hundred years old, and I took it from an engineering handbook printed in 1916'.

Living in symbiosis with the highest authority and the master of ideas is the *process character,* who actualizes initiatives in an industrial sense,

and is variously known as the anchorman, organizer, integrator, project manager, inviter, advancer, or match maker. As the process character at Humanist Company explained, 'I've been in the furniture industry for 27 years and I have good contacts in the industry. I look after the product range, because it has been drifting. I'm trying to anchor the process. I'd like to call it idea–to–launch. It's starting from definitions. I have our own and independent designers, for instance. We can't just have a subjective opinion as a criterion for what we launch'. The process character knew the rules of the process, worked with improving the process and coordination, and aimed for common criteria for success.

The *salesperson's* role operated in the shadow of the highest authority, the master of ideas, and the process character, uniting the three with the 'real world' outside. He had access to the desired contacts: the pioneer, the customer–minded salesman, a local man, and the friends of the firm. As one director said, 'It was Bill in our US organization that we were acquainted with. We gave us a hint about a new and interesting technology that was underway. He was well connected. He opened doors and got us involved in lasting cooperation with Wal–Mart. It was a critical relationship for our first garden product'. Without Bill's contacts and the interest in the new product orientation, the success would not have taken place and the idea would never have left the factory.

Teams or groups of people were recognized in association with the actors. The team served for the key actors of innovation as an extension to the formal hierarchic organization structure. The team was a dynamic solution to bring disciplines together, to spread the engagement, and to increase influence of the project. A project team is like an organism; it is born, it serves its purpose, and it dies when its days have been spent. Some teams, like a management team has a permanent status; others last but a short while. It may be a constellation set together for a particular purpose. As one managing director described: 'We have established a strategy task force. I see it as a learning process. In about a year, the same team will evolve into the management team of this firm'.

The organizations studied in this research had two other types of actors: *partial actors* and *departing actors,* Partial actors were in and out of the project on temporary assignments, part–time assignments, job rotations, or transfers from one role to another. The exits left the organization because of retirement or resignation. The matter received particular attention in mature firms in which the succession of competencies was a hot topic. Youngsters entered the firm and the elder members became their godparents. Besides the permanent actors in the firm, therefore, there was an ongoing movement of people to be managed coming and going.

Patterns of Observations: Although the activist category was one of the five most discussed themes in this research project the pattern was not consistent. In two of the six cases the discussion rate was only average (Table 35).

Player	Humanist	Plumber	Gardener	Guardian	Adventurer
S	S	S	S	M	M

Table 35. Cross–Case Comparison of Significance of *Category of Activists.*

On the detailed level (Table 36), there was little consistency. If there was a pattern to be distinguished, the accentuation of attention to different characters stood out more than the discussion about the collectives and the temporal nature of participation did.

Activists	Player	Humanist	Plumber	Gardener	Guardian	Adventurer
Collectives	Marketing task force Product improvement group, work committee, R&D steering team, project control team Management team, board	The creative team Small team Commercial team, strategy support group, foundation	Management team, board, Electra support team, core team, coffee table	The team, technical team, tool team, US–FIN pair, board	Core team, project steering team Small group, division mgmt team, group mgmt	New project team, steering committee team, stable team
Characters	Leader, inventor, functional, designer, specialists, customer–minded, seller	Superior, spiritual spokesperson, idea person, organizer, engineer, salesperson, producer, controller	Specialists, project mgr Businessperson, technocrat Grandfather, industrial designer	Superior, investor Salesman Inventor, technologist Good friends	The superior spiritual biz leader; technologist, inventors, specialists, producer, project mgr	Salesperson, technologist, chief designer, project integrator, technical producer, owner Friends of N
Partial actors	Temporary people	Job transfer	Retired person	Job rotation	Resignation	Part–time engaged

Table 36. Cross–Case Comparison of *Observations of Activists.*

Probably one of the most significant *barriers* on the individual level was the lack of personal courage to go into fields of the unknown where the failure rate was high. Not only was the employment contract at stake, but as one manager said of his chief: 'Jean's risk taking has been absolutely fundamental. Usually it has paid off. I think he has been under rather severe psychological stress. Maybe he has also seen this as interesting and exiting, but not only so. It is also about the employment of people, and financial values of relatively large proportions. Well, financially all is relative, and you do not infringe on purpose, but losing your own work is a big thing'. The activists in the drama of innovation also experienced a level of stress, which an ordinary nine–to–five employee would not have voluntarily undergone.

In making completely new things, it is sometimes necessary to recruit new competencies and engage in team building. As a technical director

said: 'When we start to recruit electronics blokes, it becomes a leadership challenge, because we cannot necessarily deal with them as we would with our mechanical workers. The culture of software houses is different from our factory culture'. The differences in factors such as mentalities, frames of references, and experiences create made it difficult for employees to understand each other. In joining forces at the level where people play and understand each other well enough to become an innovative team, the results may be seen. As the technical director continued, 'when the electronic engineer, together with a plastic technician and a caster, sit around the same coffee table and are able to talk brotherly with each other'.

Clearly recruitment and integration of the right team is a major challenge, where the differing criteria among those on the team may be the origin of difficulty. As the managing director of Humanist Company said: 'The Humanist studio is club of its own. There are a lot of trainees and young people alike, because they do not dare to hire experienced people'. Keeping in mind the full landscape of discussion of innovations gives an indication that a certain portion of the team required experience and know–how in all the fields of discussion. This probably meant that success in innovation was hard to achieve by recruiting junior resources. And when the team had been successfully brought together, there remained the fact that the environment was not always stable, which made the team–building exercise a question of several dependencies. Like the managing director said: 'The Exodus 45 team was stable, but now we sell Exodus 66 and other models and team stability is gone'.

4.2.3 The Decision Making

When an opportunity arose, the interpersonal process brought creativity into play. This description is a view of a process that moved from initiating dialogue to a concluding decision. The discussion focused primarily on constructive collaboration between the players, in search of a positive

outcome. One part of the process, naturally, was solving conflict. A more detailed discussion referred to the *triggers* for dialogue; the individual *emotions and thoughts* of those involved*;* and *the dialogue,* including the concerns of participation and resolving matters, all leading to reaching a mutual perspective, which equals the *decision*. A minor aspect of the process occurred when force was needed to reach an end.

There was always something in particular that *triggered* the process: an initiative, for instance, an impulse, some cause or question, or somebody's ambition. As a Guardian executive declared, 'The electric lock was a *matter* on our agenda for a long time and cost us millions. Or, actually, it was a bundle of *matters* of electronics, technical communication, security, distribution, and durability. And on top of that, all the technology was to be designed into a product the size of a small wristwatch'. At this early stage, the process was actually an iteration process; as they went deeper into the matter, the number of new matters increased.

When a dialogue starts, it does not begin from a blank page; rather attention is drawn to individual *emotions and thoughts* that are present from the beginning. Feelings like hope, envy, insecurity, anger, regret, sensitivity, and boredom mix with initial thoughts of the matter that has arisen. As one designer made clear, an initiative may have been received positively: 'You were proud to work for the company, like a mission in life. There was a very special enjoyment of work'. Or, it could be a gloomy mood, as expressed by another executive: 'We deal with sensitive matters. It is painful. It will not be fixed on short notice'. The emotions are a vital factor in reaching a successful communication outcome. It is not surprising that company climate was often referred to in this study as a prerequisite for innovation.

At some stage, the state of awareness exceeded the threshold where the individual was involved, and the discussion moved to *participation* in the initiative. Discussions moved into issues like commitment, encouraging people to work together in teams, and delegating responsibility. As an

executive stated, 'His involvement is very important to me. He knows things and can ask the right questions. In the future, he may be the right person to do the training'. Attention was drawn to the *conversations*, the informing, the listening, the talking, the asking, the speculations, and the explaining. The challenge was to reach common ground, when sensemaking did not work: 'It is hard to understand why people in this firm do not get it even after it has been explained– the need to sell with longer lead times', as a project manager said. *Conflicts* arose as an essential factor of dialogue and sound decision making. In constructive dialogues, the questions behind the conflicts were keys to resolving ambiguous, unsettled matters: 'The bonus system is ten years old. I have been quarreling over this. What direct connection is there between invention and profit?' Conflicts were never fully resolved, of course. If, in the end, however, the organization was unable to arrive at a common view in vital questions, it would be permanently programmed into a state of discontent and expend energy on conversations that led nowhere. When people and matters collided severely, things were not settled: the word *aggression* was even raised to describe the situation. At that stage, a shift of approach was needed, in which compromises, persuasion, and justification were featured. As one executive explained, 'The plan is, we take the briefing schedules and prices with us. Then we go to the office in Europe in order to *fight* over whether we hire junior or senior people'. It appears that diplomacy was an inescapable element required in this process.

If the process served its purpose properly, it brought the minds of participants together coherently enough to reach a *decision*. Evidence of this stage can be seen in people talking about shared understanding, common language, and accepted proofs of reference. A part of the organization's decision–making process became routine as time progressed and the criteria of the decision were not renegotiated, but were accepted as a company practice. 'We make product decisions only after proper sales forecasts have been presented', declared one managing director. Another part of the decision making that referred to instable situations like cases

of innovation, however, was not that simple. Even in the form of the simple process described above, it is assumed that there is interaction between several participants in the organization. By its very nature, an innovation involves the breaking of previously accepted conventions; the sheer number of items that are renegotiated along the process multiplies. Consequently, it was not surprising that it took a great deal of time and energy to go successfully through the process from initiative to mutual decision.

Patterns of Observations: The discussion about decision making was, in general (Table 37), one of the most recognized areas in the empirical material. A great deal of interview time was dedicated to these concerns, but the pattern of attention is not consistent across all cases.

Player	Humanist	Plumber	Gardener	Guardian	Adventurer
S	M	M	S	M	S

Table 37. Cross–Case Comparison of Significance of *Category of Decision Making.*

There is considerable evidence to support the chosen structure of the empirical material. There was, however, no particular pattern of emphasis on the detailed level (Table 38) of the discussions.

Decision	Player	Humanist	Plumber	Gardener	Guardian	Adventurer
Trigger	Attention to products	Matter of distinction	Notice of growth	Things sometimes go wrong	Question of existence	Attempt to modularize
Thoughts	Impression of the designer	Belief in capability	Excitement of people	First thought is who to blame	Concern of market position	Dislike of fancy interpretations
Dialogue	Arguments about the market	Debate about the launch	Talks about competition	Hearing and dispute	Critique of existing range	Discussion involving technical office
Decision	Agreement on extensions	Conclusion about product range	Conviction of design distinction	Consensus that it doesn't lead anywhere	Choice to mind the technological development	Decision to invest in training for customer communication
Force	Forced decision	Bring into line	Authority	Vulgar language	Laying off	'Corner room'

Table 38. Cross–Case Comparison of *Observations of Decision Making.*

Some aspect of the controversial nature of innovation was frequently raised during discussions about the use of *force* in decision making. Force may be seen as a reflection of unsettled negotiations occurring during the process, where shortcuts have been made in the conversation process. Or, it may reflect conflicting permanent beliefs between a subordinate and a superior. Nevertheless, whatever the reason, the use of authoritarian force appears ultimately to lead a termination of the subordinate's future participation in the process. As one executive said: 'I have several times been given notice to cease our undertakings, but luckily always somebody in high places has opposed'. This aspect occurred as a minor factor, yet several executives voiced this concern. Being an actor of innovation appeared to be highly dangerous and threatening to an employee's working life. This may have been the biggest risk that interviewees were unwilling to take. It probably also explained why the number of activists of innovation was small in any of these organizations.

A common *barrier* to decision making was confusion—participants not knowing who made the decisions or where the decisions were made. The confusion appears to have been associated with diverse issues. It may have been reflected in the forum in which the decision was actually negotiated and decided. As one project manager said: 'Our decision making happens in various groups; the succession of the MD has caused *confusion* among people vis–à–vis where decisions are made'. The confusion may also have been related to the drifting authority, and the ambiguity over the dominant authority. An extreme example occurred when the CEO was about to be replaced, and things started to go in circles because there was a vacuum of authority between the retiring and the incoming CEO'.

The matter of subjectivity and individualism emerging as *opposites* of the collective decision–making process was raised in many instances. As participants entered the negotiation process from diverse backgrounds, they varied in the degree to which they aligned themselves with the decision; their personal views tended to prevail. As one executive said: 'I have the *feeling* that the culmination of our troubles is that we allow too much customization'. If the view was not raised for discussion, but remained emotionally attached only with the person, it actually meant that the matter had not been resolved and that the adverse effect on collective behavior assumed an implicit form. From the outside, from time to time, this behavior was recognized as resistance to change, in that people did not move from their position and practices in situations when they should have. An example of equal informal procedure, but of developing character, was also recognized. To quote Adventurer's operations director: 'If we need to test a new material we just test it. If we need an enquiry and calculations for a new keel, for instance, we just do it. We could not always afford it, but that's been our way'. Thus vital things happened, without any formal decision.

Another complication in coordination and decision making occurred when decisions were made, but the course of events disregarded decisions. As a frustrated managing director said: 'We have talked about this many,

many times. And he understands the issue. When the situation actually occurs, however, he gets impulsive and agreements are forgotten. Then he goes directly to the designers and starts giving them instructions. Think of the product manager who is in charge in that situation; the whole project runs out of his hands'. This CEO was talking about the retired entrepreneur and chair of the board, which demonstrated a severe complication and conflict that was felt in and escalated at the lower levels of the organization. This outcome (no actual decisions were reached in the end) appeared to have been caused by an unfortunate coordination of initiatives, conflicting convictions and emotions, and a failure in dialogue.

Typically, if such an outcome occurs in an organization, the conflict and complications that precipitated it become so severe that the situation is eventually solved by force, resulting in either party—usually the person of lower rank who has less power in such a struggle—having to leave the organization. In the case at hand, said one manager, 'The factory manager at that time defended his unauthorized purchase of machinery to the CEO. He was not humble at all; rather he stubbornly argued that he was convinced it was the right decision. Consequently he was fired'. That statement indicated that the fired manger's attitude was fatal, as it caused the CEO to disregard the argument made by the factory manager and use the unauthorized investment in machinery as the criterion for dismissal. Subsequent events, however, supported the factory manager; the investment decision had been the right one, as the product's sales soared only months after the firing incident, and the firm became as successful as it had been 40 years earlier. As the manager continued, 'If the factory manager had only had the credit of one earlier innovation success, and a more humble attitude, then he probably would have survived in the organization.

4.2.4 The Spirit

As found in Section 3, collectively shared emotions in the firm have far–reaching consequences. The attention then turned to spirit, which in this context is understood as the mutual feelings and thoughts and desires of the collective. Spirit not only involves the participants in the firm, but also those external peers variously associated with invention.

Based on the interviews, spirit appeared to have three dimensions, or, more specifically, the matter appeared on three levels: the company, the team, and the individual. The firm *collective* angle focused on the strategic achievement and success of the firm as one entity. On a *team* level, team spirit united the individuals in a smaller, more intensive context. On the individual level, the discussions addressed the *personal* emotional experience that engaged the person in the process of delivering an invention. These three levels complemented each other.

Company spirit seemed to be accepted by all the employees of the firm—the working community. Company spirit could also be called the mutual values of the company. The collective spirit was an aspiration to be, among other characteristics, successful, entrepreneurial, innovative, front–runner, sales/customer–oriented, industrious, determined, open, and patient. As one managing director clarified: 'In my leadership philosophy, innovativeness has been a cornerstone of the firm and high on the company agenda'. The firms commonly had written manifestos that were used to stimulate the desired collective behavior within the organization. Besides the fact that there are numerous definitions of the good, they were competing with each other and probably with other adverse values associated with innovation in different situations. Those adverse values might have been safety, stability, rationality, formality, sensibility, or discipline. The values described below belong to the same category.

Team spirit was like a subculture within the firm, and is like the glue between its club members. The style of team spirit was not necessarily the

same throughout the entire organization. On the team level were ideals like informality, freedom, disobedience, good will, sincerity, trust, respect, reciprocity, and commitment in *direct interaction* with peers. There were potential clashes as an innovative team broke old rules of the company when creating new products and rules. As one chief designer said: 'Numerous things have been dealt with, without approval on a Saturday evening in my garage'. It is clear that if the entire organization worked this way, chaos would result. If a company rules too strictly over its team, however, the result could be no innovations.

Individual spirit refers to a purely subjective mind set, and is a complement to the collective spirit. Based on the interviews, it encompassed individual motivation, passion about an employee's interests, pride, and humility. The basis of the collective spirit arose from this level of sentiment. As a successful chief designer said: 'A journalist asked me what is driving me to work on this innovation. I answered that my motive was to keep the hometown, the nation, and myself employed. If hundreds of workers do not have work, neither they nor I have anything to do here'. Strong motivation, combined with hard work appeared to be a substitute for bad luck, then. He continued, 'Chance favors a prepared mind; usually when you start with something and have worked on it for a long time, the coincidence happens. You don't have luck if you don't work hard.'

In two cases, a *user community was* close to the firm and appeared to reflect the spirit of the firm. In the Humanist case, a community labelled 'contemporaries of Simon Storm' represented some kind of spiritual community of like–mined people. In the Adventurer case, individuals were defined as 'Friends of Adventurer', and an Exodus Class racing community organized into an owners association. The function of the community was centered around the owners of a particular yacht class. In both cases, there were opportunities for the company to be part of a vital community. And in both cases, there were customers among the population—but not only customers.

Patterns of Observations: The recognition of spirit in the firm received average attention consistently across all the cases (Table 39). In some sense, it was surprising, keeping in mind that a great deal has been said about the necessity of a good organizational climate' as a requirement for innovation. One possible explanation for the leaders not stressing this factor could be seen in their own situation; it is likely that these actors created the good spirit in the firm, and that they did not expect others to do that job. Furthermore, the good spirit probably does not come by talking, but through doing and through results.

Player	Humanist	Plumber	Gardener	Guardian	Adventurer
M	M	M	M	M	M

Table 39. Cross–Case Comparison of Significance of *Category of Spirit.*

Examining the discussion on a more detailed level (Table 40) reveals that no one subject was stressed over another, but that the intensity of the attention went across all subjects.

Spirit	Player	Humanist	Plumber	Gardener	Guardian	Adventurer
Company	Customer orientation	Marketing orientation	Entrepreneur–ship	Risk taking	Innovative	Renewal
Team, peers	Getting along with each other	Interpersonal chemistry	Humanness	'We will show them'	Reciprocity	'We go where we like'
Individual	Interest in	Pride	Motivation	Curiosity	Mood	Passion

Table 40. Cross–Case Comparison of Significance of *Observations of Spirit*.

The *barriers* of spirit appear to have been the opposite of what has been mentioned previously in positive terms. In general it was seen as a balance

between the formal and informal, the mechanistic and the organic—inflexible systems working for a purpose other than instability. Said one executive: 'The modern bonus schemes work against entrepreneurialism', referring to bonus system aimed at predictable results that did not reflect the true nature of unpredictability associated with the minds of inventors. As breaking new ground is said to require courage and risk taking, the organizational setting created a preference for uninterrupted operations and efficiency. It was practiced by eliminating problems, as one executive explained: 'The organization seeking *security* only looks for proven solutions'. Or it was practiced by overdoing formal control, as another executive said: 'We should deal with ideas and thoughts in an *informal* way, when they occur. It can't be a formal process'. Although that statement cried out for informality and courage, it clearly recognized the disadvantage of too much of these attributes. The organization as a collective relied on individual differences, which in turn necessitated tolerance of these differences. As one technical director said: 'It is human that everyone can't see the vision clearly; some people have to be reminded over and over again'. The same applies to overly opportunistic behavior—it has a price. 'Too much individual enthusiasm made the decision process fail, and we brought an excellent product onto the market too early', said another managing director.

4.2.5 The Inventing

Having addressed the fundamentals of innovation in a company–conditions, actors, dialogue and decisions, and spirit—my attention was drawn to the invention itself, the origins of an idea and the evolution of an idea. Four aspects appeared in the discussion: the *requirements;* the *wakening of an idea,* which primarily addressed the origin of the idea; the *evolutionary stages* of inventing a product, which addressed the evolutionary deliverables from idea to product; and, finally, the *ways of working,* which addressed the practical work of an inventor.

Most of the inventing seemed to have had its starting point in some existing range of products. The discussion appeared to have its roots in *distinct requirements* for the product. The requirements are attributed either to an intended product or to ideas of a product that emerged from a user need not yet met. One dimension of the requirements alluded to generic features, like 'best in the world'. Many requirements went hand–in–hand with the diverse characteristics of the product. In the case of Adventurer, a requirement was 'the proven solutions", and when the solutions were tested under extreme conditions at sea, rescue surely was an unpleasant option if the solution failed. In the case of Humanist, 'functional and minimalist design', was a requirement from the past and the present. A requirement at Gardener was 'clever solutions and freedom of maintenance', a factor that would help the user when using the tools. In the Player case, the overriding requirements were 'fantasy, simplicity, and play safety', which was easily understood, as the users were small children. In the case of Plumber, the features of 'functionality and design' were the central requirements in the quest to differentiate the new product from the bulk suppliers. And at Guardian Company, 'solutions preventing lock picking' were central generic requirement.

The attention now shifted to opportunity *recognition and source of ideas*. Partly, the ideas were said to be something that existed long before it was founded. As a chief designer said, 'I did actually find the idea from an old engineering handbook dated 1907'. The ideas were created partly through cognition and reflection, as a project manager said: 'Through thinking, ideas take shape. If you are under stress you do not have time to think. I've had ideas when I've been out jogging; I've had many ideas just by having the time for reflection'. The individuals are in the center of recognizing ideas, and some people were better fit for recognizing ideas than others. Said a senior executive: 'For us old boys, it has been remarkably positive when new people enter our company. They have fresh ideas and can question things that we are blind to'. New people were seen, then, as the solution for the firm to find ideas.

In speaking about new ideas, associations were commonly made to solutions that had been found in another industry. Archetypes of another industry gave new insights and ideas. Said one chief designer: 'The solution was seen as weird as the cogs of the cutter were visible and not covered. I explained that this technology is the same as applied in Charlie Chaplin's film Modern Times, and that made people see the idea.' Associations led to new associations, and this thought process facilitated seeing different things and seeing things differently. These views provided an outside perspective of the firm's industry.

The discussion turned to *ways of creating* new things. What was the way of working that brought innovations along? As can be expected when confronting the unknown of innovation, specific instructions were not the answer. An analogy may have provided an indicative answer, told by one executive:

> Think of a bird with a long beak, flying with its mouth open at the edge of the water. When it catches a fish, it closes the beak and swallows. The bird knows well that if it does not fly back and forth over the lake it will not get anything. Innovation is a similar process; we are out fishing, but we don't know what we'll get. You can't decide when it happens. If you work unconditionally and eagerly, things usually come up. Chance favors a prepared mind'.
>
> Creation of new things comes up when you work completely unconditionally. In a certain direction, of course, but with some type of loose framework. Often the work is not what you have been assigned to do. A lot of good work has been done without deliberate permission'.

Planned coincidence appeared to rule. Interviewees who said that they focused on something, eventually saw new things. It followed that one of the prime explanations is that innovation success is associated with the frequency of initiatives. The experience of doing many things likely brought along certain general rules, and these rules varied by activist. A

mental frame of achieving something genuinely and commercially new may have been based on a view such as that of the technologist who said: 'We have learned to combine technology and materials. We try always to keep three aspects present in a new product: preferably improved functionality; possibly new technology and new material, the costs of which make sense; and, finally, design that supports all this'. That statement is like a miniature theory, of causality; try unusual combinations, add new functionality, constrain costs, and make the product look appealing. The empirical material featured various combinations of previously unrelated things, and things adapted from experience and subjected to experimentation, and resulted in new product concepts.

Eventually the attention moved to the *creations,* which were the *deliverables* of the concept generation activities. The foremost and most critical deliverable was an added–value product, one that made the business flourish by generating returns for those who had lent funds to the firm: 'We have delivered something every year. In fact, we also have had the merit of two worldviews. Over the past 15 years, we have improved our results every quarter', said a managing director. The line is from case Gardener which is one of the hallmark companies of invention in this research. When the abstraction level was reduced to creations, attention concentrated on productification like drafts of ideas, technical solutions, buildings like prototypes at various stages, naming of the previously unknown, test–run products, first commercial versions, improvements of existing product functions, cost–reduction improved products, variants of a base product, face lifts of existing range, next–generation creations, or supporting services.

One finding is that innovation tends to be seen as moving from idea to manufacturing the product and successful launch on the market. From a doer's perspective, however, there appeared to be no end to development. It appeared difficult to draw a distinct line between the end and the new beginning of an innovation cycle, for instance. This continuity appeared to be due to the fact, that in a mature firm, most of the elements of the

new product were carried forward from what was there in the past; only a layer of an invention in a mature firm appeared to be groundbreaking. The more radical the innovation, the less it carried forward inheritances from the past organizational configuration. If nothing was carried forward, there appeared to be no rationale whatsoever to explain why the firm had been engaged in product development in the first place.

Patterns of Observations: The attention paid to invention was, on a general level (Table 41), a significantly recognized concern to executives at the top of the firm. The evidence across the cases was bimodal, however: half of the sample paid considerable attention to this discussion and half paid significantly less attention.

Player	Humanist	Plumber	Gardener	Guardian	Adventurer
S	M	M	S	M	S

Table 41. Cross–Case Comparison of Significance of *Category of Invention.*

On a detailed level (Table 42), the discussion consistently addressed all four aspects that had been introduced concerning invention. Only the discussion using other industries as reference for the invention fell behind the attention of the others. Still, those discussions were not insignificant.

Invention	Player	Humanist	Plumber	Gardener	Guardian	Adventurer
Recognition – Origin –	Insight of technology leap	Idea of product range	Inspiration from UK high tech firm	Engineering handbook from 1916	Recognize patents; means of criminals	Initiative from the owner
Requirement	Exceptional	Ascetic	Practical	TechGear	Safe	Proven
Way of creating	Combining chip to wood, learning	Adapt from design/arts	Experiment with electronic techs	Renewal of tooling	Separation of organizations	Selection of 1st client
Creations, stages of creations	Prototype	Intellectual concepts	Range of versions	World news solution	Next product generation	Face lift
Associating businesses	Training, ship building	Fashion industry	Electronics in cars	Charlie Chaplin films	Car locking	Power boats, design firms

Table 42. Cross–Case Comparison of *Observations of Invention.*

The fundamental *limitation* is that the innovation did not come to fruition in the expected time. Said one executive: 'I told my people that we needed to have a new invention a year from now on. But it *did not work*. Then we changed our approach. We revisited the brief material, the archive of patent applications, and the inventory of templates, and we did a lot of work. And it worked'. The time dimension of innovation was only remotely connected to the calendar year, which was the general timeframe for the routine budgeting process exercise of the firm, a process that involved planning and allocating resources. To quote a project manager: 'The lead time for the product development of a good piece of furniture is from one to two years. It is not possible to make it faster'. When the overriding condition became the yearly allocation practice, it probably started to reduce the extent to which radical innovations occurred. As the budget was commonly connected to the incentive systems of the firm, the house of innovation was built on sand. As one managing director said, 'The company management was moved to the US in the 1980s. Their bonus system was not a proper one as it was ten years old. I have debated how the bonus system affects product development? It is not easy

to determine this relationship, with the prevailing economical and sales values. To say the least, they are not good measures, and the system is a bad method for promoting innovation'. One drawback of incentive systems is that if they deliver what they are supposed to deliver, in a situation of conflicting priorities, it downgrades risk taking. That was probably seen in the challenge changing the status quo, as it faced the difficulty of creating something completely new. Sometimes the limitations were seen as insufficient solutions, despite the presence of an innovation. 'Design only does not make it; it needs to be combined with technology and functionality to make a superior product', said one designer. Surely the behavior could be partly explained by a striving for stability and risk avoidance: 'The mentality of not accepting new solutions is painful. The organization relies on proven solutions. But proven solutions are yesterday's solutions', as one managing director complained. Limitations could also be explained by the shortcomings in cooperation and capability. As one eager manager said, 'I have thrown tens of ideas that I found around me to product development. But nothing happens, when it is "not in the bonus scheme or following formal the process"'. In three of the firms studied, there was a setting where a vital part of the creating was delegated to a strategic partner; distinct considerations and barriers associated with the remote location of the collaborators were raised. To quote a chief designer: 'We have our own tool manufacturing, in order to test and see with our own eyes the technical risks with a new product. The experience may produce a new solution, a solution that we might not have encountered if the tool works were made in Taiwan'. The distance of overseas collaboration appears to take place at the expense of the informal communication.

4.2.6 The Learning and Skills

This discussion deals principally with the abilities, technical skills, and learning associated with invention. In the discussions, the *abilities* appeared to have been of a general type of wisdom; whereas the discussions about

the *skills* are associated with more distinct professions and technical skills. The discussion about the *learning* dealt with gaps in competencies, and the ways of developing competence.

Ability is defined here as something a person is able to do because of particular mental skills. Abilities cannot be learned, they grow with life experience. This subject was consistently stressed in all the cases. Why? The invention goes hand in hand with many unfamiliar situations, questions, and solutions. Abilities like knowledge, understanding, judgment, memory, and tacit knowledge give a person the readiness to meet the unfamiliar in a constructive way. As one executive said: 'I use to talk about unconscious incompetence. That is the state in which you make decisions. You reach that state after you have come to know a whole lot, and you come to realize how little you know; that is conscious incompetence. That is a healthy state'. Humility and a reliance on experiences and instincts were in demand in the decision–making process when innovations were on the table.

On the general level, business thinking, interpersonal skills and language skills were said to be needed. Bearing in mind the broad landscape of attention, it is evident that experience was considered to be the indispensable foundation of skills for the activist. The broad scope of experience and skills required for confronting the new, leads logically to a requirement of several professions on the team. Professional skills that were stressed in our discussions were skills in various technical fields, product skills, marketing and sales skills, financial skills, leadership skills, and rhetorical skills. In specific fields, unique and profound fields of knowledge were in demand. To quote one Adventurer executive, 'These are unique yachts; you have to know the product well to sell it to our experienced customers'. The set of skills of each firm are specific, as the various firms confront different environments and are engaged in different activities. Whether sailing skills, architectural skills, handicraft skills, or tutorial skills, the interviewees from each company spoke of the specialization needed in their industry.

The ability to confront unknown growth was said to go hand in hand with personal learning in this study. Sometimes it was necessary to confront the new triggers or the need for training; sometimes the learning of the new is the seed for the invention. Using new materials or manufacturing methods made past skills outdated, and triggered the need for learning. Nevertheless, evidence was also found for the opposite. As one technical executive stated: 'Richard and I, among others, were working for a month in a consultancy firm in Europe that was making high technology. We were sent there without any particular assignment from the Plumbing Company. We got acquainted with this environment and technology, and the European way of working. After that, we were convinced that electronics would become part of the faucets in homes. That made us work systematically for this mission'. The learning methods ranged from technical education, through courses, to on–the–job training and apprenticeship. Practice through trial and error was underlined in several instances.

Patterns of Observations: The category of discussion about the skills and learning consistency received a medium level of attention (Table 43). The issue may have been recognized more if the sample had included start–up companies. In mature firms the role of know–how probably takes a natural position in the discussions.

Player	Humanist	Plumber	Gardener	Guardian	Adventurer
M	M	M	M	M	M

Table 43. Cross–Case Comparison of Significance of *Category of Learning and Skills.*

At the detailed level (Table 44), abilities received significant attention consistently across all cases, followed by the attention paid to learning.

Learning	Player	Humanist	Plumber	Gardener	Guardian	Adventurer
Abilities	Understanding the situation	View of the operations	Memory of past situations	Awareness of profitability	Familiar with the field	Talk the language of the sailors
Skills	Design language	Language languages	Business thinking	Financial judgment	Electrical skills	Yacht design skills
Learning	Learn idea trends	Learn from mistakes	Electronics education	Find out new technology	Product training	Competence from the customer

Table 44. Cross–Case Comparison of *Observations of Learning and Skills.*

One of the major *barriers* was thought to be the mental limitations of management to reframe their own conviction of the capabilities of the organization As one project manager said, 'We can be present in the living room, in the kitchen and even the bedroom. But our know–how does not stretch to the bathroom'. The same applies on a lower level of abstraction, concerning the capacity of management. In the first place, when ground–breaking initiatives come across, the existing organization is confronted with personal growth, and not everyone may have been able to cope with the challenge and learn. To quote a managing director: 'I saw that there was an enormous development opportunity. But the question arose: How can the present management grow in its ability to face the challenges?' The expression was seemingly projected onto the subordinate, which suggested that there might have been reasons to think about recruiting new people. The constraint may also have been managerial unwillingness to release competent resources, from a comfortable position, for the sake of an undertaking that was risky and for which the individual was unequipped, because of a lack of experience in a field in which nobody is experienced.

Another dimension of the managerial challenge was to be a leader of people outside the manager's area of competence. Said one technical director: 'It has been a major learning for us, and I think it is the big

thing, that we get along, we can manage the diversity of new professionals skills in our company.' Hiring is only one of the channels for incorporating fresh thinking and experience. The external affiliates of the company also provided a source of skills, in addition to a special feature of a more independent actor. To quote a project manager: 'Without external individuals the team work would lack of liberal thinking and critique'. The internal division of labor inevitably contained the social element of unity, which to some extent may have become a burden for the organization. A problem of different and latent characteristics, but with a similar solution, is seen in the relationship that the employees themselves have to what the firm delivers. Most of the employees were users of the product that their firm produced. From this follows a distance of understanding of the use and all what goes with it. As a managing director expressed it, 'We don't live our product. That's why we are increasingly relying on our highly experienced customers. That increases the requirement of skills talking with the customer'.

4.2.7 The Practices and Arrangements

Leaders discussed several different arrangements and practices along the path from the idea to the realization of the innovation, reducing the friction of flow and improving the preparedness for the organization dealing with inventions. The practices and arrangements appeared to be of implicit character, activated only when needed. The actors appeared to view them as a self–evident a short time after they have been implemented. When I looked more deeply into the cases, it appeared that the practices and arrangements had been shaped by years of experience. The discussion addressed, in particular, various *ways of doing things*, *documentation*, the *tooling, and premises.* They further discussed matters related to experimentation such as the *laboratory*, the *prototypes,* and *trials*. Finally, the topic of *patents* was introduced as an arrangement protecting what had been invented.

The *habits*, or ways of doing things, or procedures, are daily practices done regularly, commonly without thinking of them, because they have been done so often. The advantage of habits is that things get done without much notice. Habit brings regularity into the organization, which is also its draw back. 'Things have always been done this way. That's why it is done so now also', said one production manager. Habits can be a limitation for the organization. Habits appear in many ways, such as selling, representing, approving, reacting, and even showing appreciation. The practices have evolved over good and bad experiences. As one managing director said, 'In our company the inventors and the marketing persons always travel in pairs'. The habit of travelling in pairs energized the memory of the trip and stimulated dialogue between the travellers, and was consequently seen to boost the development.

Documentation practice extends the collective memory from discussions to meetings and events and stabilizes decisions made during the long period that innovation usually requires. Documentation was usually related to innovation like design briefs, drawings, pictures, renderings, checklists, specifications, and archive, and was implemented in order to manage the projects. To quote one technical director, 'The US naval architects were very engaged in building the first yachts when the firm was founded and they spent a great deal of time in our country instructing the boat builders. Later, the US naval architects were not needed on the premises, but drawings and quality inspections substituted their presence. Our documented specification, drawings and building instructions of today originate from that time'. Not only did the documentation substitute the control, it simultaneously planted a practice that created a unique, quality way of doing, and can partly explain why the firm has gained a world–class quality status recognition. The documentation created product reliability.

Another building block of sustaining settings are the *premises*, which has the effect of tangible habits. They are constantly there for a useful purpose. The premises serve as a meeting point of resource, creating a unique advantage. As one production manager explained: 'In this factory,

we have technology development, development of manufacturing tools, the manufacturing machinery, and manufacturing. Doesn't it look special? The strength comes as an ability to industrialize challenging product projects, however. We can see with our own eyes that it works'. Like the habits, the premises are rigid, and introduce drawbacks. Staff working on different premises, like office and factory, tended to become alienated from each other. An interesting finding is that there appeared to be formal premises like the factory, office, and meeting rooms; and informal premises like the coffee room, the canteen, and even the local bar. The informal grounds seemed to bring forth free thinking and more genuine opinions and judgment. The production manager continued: 'We have product development, tool development, and the manufacturing process around the same coffee table. Already an early stage of a new product debate starts on production technology, materials: Can we make it? We discuss it at the coffee table, where consensus can be reached'. Surely the judgment process of the firm did not mainly take place primarily at the coffee table, but it acts as a complement in the process of building conviction in difficult cases.

The 'tool box' has an effect similar to that of habits, and the premises make it possible to do things, while introducing implicit limitations for the firm. Particularly in industrial companies, *machinery and tooling* appears to be one of the starting points in the making of new inventions. As the main investments are made in production infrastructure, industrial firms tend to be production oriented. There were apparent benefits for the sample firms to start the thinking from past investments in infrastructure. Using existing gear shortened development time and saved money. The initial reflection might have been that sticking to existing infrastructure would imply shorten steps in business development. As a managing director of Gardener said: 'We discovered that the office scissors we manufactured were made with similar machines and materials compared with garden cutters. As we invented the one–shot technology, we were able to cut production costs dramatically, and enter the garden tool market. It

was the first step for us to become the garden tool company of today'.

As that story demonstrated, the tooling was partly frozen for a particular purpose, but useful for other purposes with certain alterations. In this case, the one–shot technology was a partial innovation, which opened the way to conquering a similar business sector. The 'hardware' came in many forms in the companies observed: drawing desks, computers, working tools, moulds, jigs, work stations, machinery, and production lines.

Several arrangements and practices were related to the experimentation process. It was hardly surprising as they provided an opportunity to look into the future and influence the success of today's future products. The *laboratory* as such generated a great deal of attention in the process, but its existence is vital for the process. The laboratory provided the first insight into the making and breaking of an invention. As one project manager said: 'In our workshop, we can study the suitability of new materials in our production process, strength tests, and usability of new products'. The laboratory results have limitations nevertheless. The modeling of the actual environment is challenging. Surprises come from such lack of knowledge as not knowing the actual impact of where the product eventually will be used or the impact of the limitations of the product made in an industrial scale. 'Laboratory results are inferior to experiences from a genuine environment of use', said one technical executive. In some cases, therefore, the laboratory activity was dislocated to field laboratories in order to provide more complete data.

Different *prototypes* occurred in every case, as enablers of future experiences. The role designated to prototypes varied greatly across cases. The usual role of the prototype appears to have been a showcase. As one designer explained, 'I travelled around with the lopper model made of wood showing it to a few customers. The one–shot lopper idea was so superior that it sold itself'. An equally familiar role of the prototype tends to be oriented more toward production situations: 'When we develop the prototype, we are equally concerned that the products are feasible

for large scale production', said a production manager. Or the prototype may have been regarded as a part of the verifying the material part of the idea: As another designer stated, 'We have these evolution models. They are not necessarily intended for sales or publicity—merely to experiment with materials and methods'. In some cases the prototype may even have been equal to the first commercial product. To quote a managing director: 'Our customers are special. We have to make it in a way that allows them to think they are number one. If we select one customer to take part in a project, we disappoint the others'. It goes without saying that the prototype was an essential part of the domino effect of attracting customers.

The idea matures enough during the experimentation process, and applying for the *patent* becomes of interest as a preventive arrangement. As an operations director said, 'We have a lot of ideas waiting for the patent application to be sent. The applications are sent as late as possible, when we are sure we have a true innovation and the trust and experience that it works'. Apparently the practice of timing was considered; the competitors got to know about it as late as possible. In some firms the patent appeared to be a practice; in some, it seemed to have little relevance. In one of the cases, the patent protection was a vital part of the firm's business strategy. In another, the Guardian case, the patents demonstrated an exceptional limitation to the business. They expired in 20 years, but the effective time was only 10 years, bearing in mind that it takes some 5 years to build a mass market. Furthermore, when the patent was about 15 years into its life, customers started to hold their investments, waiting for the next generation of locks.

Patterns of Observations: The discussions were consistent across all cases, with an average level of recognition (Table 45).

Player	Humanist	Plumber	Gardener	Guardian	Adventurer
M	M	M	M	M	M

Table 45. Cross–Case Comparison of Significance of *Category of Practices & Arrangements.*

On a detailed level (Table 46), this discussion was dominated by practical ways of working, related documentation, and the premises of operations. Bearing in mind the topic of these discussions, it was surprising that the more specific subjects of innovation like the prototypes, the laboratory, and the patents generally played a peripheral role in the discussions.

Practices	Player	Humanist	Plumber	Gardener	Guardian	Adventurer
Way of doing	Way dealing with ideas	Way of reacting	Way of gratifying	Habit of evening coffee & cigar break talks	Way of completing a product dev.	Way of thinking of the yacht
Documentation	Drawings	Specification	Product specification	Least–needed bureaucracy	Archive of inventions	Drawings and specification
Prototype	Test prototype	Commercial prototypes	Demo prototypes, 99% complete product	Demo proto	Pre–production, 99% complete product	No. 1 prototype
Laboratory	Work shop	Atelier, off premises	VTT cooperation	Manufacturing off–line work	In–house, secret service	In–house, cooperation, network
Premises	Separate building	Separate Humanist studio	Same R&D–manufacturing premises	Designer office and coffee table	Single premise	…
Tooling	Testing track	CAD, e–mail	Manufacturing tools	In–house tool manufacturing	Manufacturing tools	Hull mould
Hardware	Machine– and labor–intensive	Machine–intensive	Machine–intensive	Machine intensive	Machine–intensive	Labor Intensive
Patents	…	…	Marginal	Benchmark, running faster	20 years protection, 10 years effective	…

Table 46. Cross–Case Comparison of *Observations of Practices & Arrangements.*

Not surprisingly, the barriers introduced in this discussion are *stuck with the settings* of the past. As practices have been built over a long period of time, they have often faded from active consciousness. This topic should probably have received more attention that it was given by the top managers of the firms: As a chief designer said, 'I am unable to say why innovations works in our company, because I am too close. We have become blind'. Managerial blindness may mean that management has been too disconnected from the informal way of working in the firm, and decision making has lost contact with the actual flow of activity, perhaps leading to wrong decisions. As one frustrated activist said, 'Product development should start from a genuine new idea, not from formalizing a project and writing memos'. Otherwise, the gaps in the practices tend to become latent and have to be repeated over and over again. To quote a project manager from Guardian Company, 'Our house has a tendency to launch new lock models to the market, but after that it takes one year to make it complete'. Then one problem lead to another, when semi–finished projects came into the wrong hands. Another project manger claimed: 'If we launch prototypes as if they were commercial products, we mislead customers.'

These shortcomings may be partly explained by poor practices earlier in the process, where the production function in an industrial firm is the usual victim. One production manager agreed: 'There tends to be too little time in the new product schedule for tool development'. The lack of time was usually connected to the rigidity of production, as that function had many built–in elements in the production setting, which made it difficult to adapt. The complaint may also have reflected attitudes in the firm, however. Going further backwards along the chain of cause–and–effect, other 'thieves of time' were found to be associated with the practice of dealing, for instance, for instance, with customers who were part of the project and the process. As a managing director of Adventurer added: 'What is the downside of this is that these people are very strong personalities, and all of them believe very strongly that they are right'. Thus

controversies and disagreements may be found along the all phases of the flow of activities, where the tacit way of doing prevents management from coming to grips with changing the firm—when it is not able to innovate, for instance.

Summary and Connection to Theory

The individual motivation–driven factors are like the external rulers; the management of the firm cannot control them. Motivation–driven factors differ from external rulers in that they can be confronted, fact by fact, if the management chooses to do so. Yet, the character of the discussions in this domain has suggested that if people decided not to participate, the meaning of these elements vanished from the firm. Key elements of this domain of discussion were, beyond the *key persons*, in the interpretation of the *preconditions of leadership*, leading to *decision making* associated with the discussion about *invention*. Finally, discussion related to *practical arrangements* and *know–how* was related to innovations. In particular, the interpretation of the preconditions strongly linked the discussion about the internal domain of discussion to the domain of external rulers. The conclusion of the existing knowledge of the environment, commonly referred to as the situation where the firm stands in relationship to the outside world, turns into a general synthesis as the general purpose of the firm and the organization.

To a large extent, this domain corresponds to administrative theory, and, more specifically, to theory of informal organizations, which was described in the Part 2: Theories. Only parts of the discussion about strategy, as an aspect of the preconditions of leadership, did not fully fit with the informal organization theory (see further discussion in Part 3: Theories and the theory of 'Deliberate and Emergent Strategies'). The theory of innovation management was clearly present in this domain of discussions, more specifically in the theoretical chapter, as the theory of organic management systems. According to innovation theory, in unstable

conditions when it is difficult to read the environment and when the outcomes of an coalition is uncertain, the elements of this domain of discussion become vital to be recognized by the leaders in an innovative firm. In the theory of the organic decision making, attention was drawn to the *contribution* of special knowledge and experience in the general task of the firm, commitment to the purpose and task of the firm and loosely defined responsibilities. There was continuous dialogue redefining thoughts; location of authority of know–how could be located anywhere in the organization and a network of control where the sanctions are made more by the community than by the superior. The balance and interaction between the formal and informal behavior was essential, however, and inevitable for the organization to adapt to new situations. Also the theory of organic versus mechanistic management systems argued for a balance. The theory of the firm introduced the same inflexion point as a behavior of 'sequential attention to problems', as a vital claim for the firm to sustain despite conflicting goals. Later analysis provides further support for these suggestions.

There was another relevant and vital reference in this domain of discussion to the behavioral theory of the firm. Despite the fact that that theory was strongly oriented toward the stable environmental orientation, which can often be a barrier to innovation, the theory of the firm provided a useful prediction of the limiting aspects of the firm and why the firm is not innovative. More specifically, the theory refers to traits in association to aspects like the goal formation process, the organizational choice attributed to standard operating procedures, and decision making. It was suggested that the organization inherently tried to avoid uncertainty by sticking to implicit and explicit rules—simple rules. In this field of individual and motivation–driven discussion, however, the explicit rules and control systems were absent, which is why the individuals acting in this field and mastering this domain of discussion needed to rely on themselves. This is a rare behavior, according to the theory of the firm. It follows that the theory of promoters or champions was probably a vital theoretical and practical

factor to consider when explaining successful leadership of innovation. A further comparison between more specific areas of theory and the empirical observations in this domain of discussion is discussed in Part 5: Analysis.

4.3 Internal System Driven Factors

The third area of discussion highlights the internal rational *system–driven* factors of innovation. This domain deals with themes that have much in common with the characteristics of the formal organization. Four such issues emerge from discussions with the leaders in the six case firms: the *functional structures* of the firm, *process*–related matters, *project administration* dealing with innovation, *sales–process*–related concerns, and innovation regarded from an *economic* perspective.

4.3.1 The Functional Structure

The discussion on functional structure reflected organizational structural thinking and the division of labor in the firm. As a function, *manufacturing* clearly dominated the discussions; the role of *research & development* and *marketing* were also stressed. In this book, marketing refers to the combined function of sales and marketing, as the interviewees did not seem to make a distinction between the two in the interviews. When talking about the manufacturing function, there was a tendency for the leaders to talk in the same breath about the manufacturing work and the workers. A discussion of more marginal character, yet clearly present, related to the *operational* efforts supporting sales and marketing. From time to time, the term *operational* was used for talking about the firm's general daily activities.

R&D departments existed in every firm examined in this study. However, the centrality of their role varied across cases. In mature settings, the role of R&D seemed to have been equal to that of marketing and manufacturing, perhaps because the R&D people so often served

as the initiators of new products. Furthermore, their department heads had good track records and high credibility. Advanced technological expertise strengthened the positions of these R&D departments. In cases in which the R&D had a mediocre track record, the department appeared to have been detached from the organization. In these cases, many of the department members appeared not to have confidence in each other, and the department's success story was difficult to find. These employees appeared to have little in common, materially or mentally. The physical distance was not a barrier to success, however. In three of the cases, the chief creative role was located in a strategically aligned, external organization: a Domestic–South American firm that has been in business for 40 years, a Domestic–South European firm with a 5–year history, and a 3–year–old Domestic–European coalition. Success correlated strongly with the length of time these organizations had been associated with each other.

The *marketing department* did not tend to play a leading role in these discussions. A common finding was that the marketing department's role appeared to be more supportive than product creative, probably because the marketing department was less technically competent than the R&D department. Operational marketing directed toward the sales channels and centered on the customer seems to have been the major focus of marketing. Brand building appears to have been a primary concern of the marketing department. In only one of the cases was there a clear signal of a marketing department taking the initiative for invention.

The *manufacturing department* was the center of attention in the interviews. That focus is understandable, as that department usually has the majority of the employees, uses most of the fixed assets of the firm, and delivers the product to the market. Five of the six firms relied on their own factories, and the sixth Humanist Company contracts its manufacturing. The degree of labor intensiveness ranged from handicraft work to capital–intensive production lines. The discussion about production was fragmented into such sub–functions as assembly and steel workshop.

The other functions were incorporated into our discussions of

operations, and received an average amount of attention in most of the firms on the attention measure. Functions like invoicing, internal logistics, personnel, and finance administration were acknowledged. This finding serves as a reminder of how integrated invention is in an organization. It simultaneously underlines the fact that invention is not merely the tossing around of ideas and experiments.

Patterns of observations. In general, the discussion about the organizational functions of the firm was a subject of average interest on the attention measure (Table 47).

Player	Humanist	Plumber	Gardener	Guardian	Adventurer
M	M	M	M	M	M

Table 47. Cross–Case Comparison of Significance of *Category of Functional Structure.*

In a detailed breakdown (Table 48) of our interview discussions, the manufacturing department received most of the attention, and in most cases it received significant attention. Discussion about the R&D department was generally dedicated modest attention. It seems that the immaturity of the R&D setting went hand in hand with the inability to innovate.

Functional	Player	Humanist	Plumber	Gardener	Guardian	Adventurer
R&D	Young department	Young UK alliance	European alliance, design for manufacturing	Lead department and design for manufacturing	Role designated units, group matrix	Argentinean alliance, design for manufacturing
Marketing	Young department	Vague role	Brand and operational	Operational marketing	Customer service focus	Young department, brand and brief focus
Manufacturing	One factory	Subcontracted	One factory	One factory, subcontract	One factory	Assembly, tree mfg units, subcontracted
Misc. operations	Purchasing	Warehouse	Personnel	Layout planning	Invoicing	Logistics

Table 48. Cross–Case Comparison of *Observations of Functional Structure.*

The *problems* related to the functional structure appeared in both the theoretical and practical discussions were an unsettled matter. Drawing on the assumption that the importance of the contributions of skills and judgment varies with changes in the environment and with the situation, no fixed solution is likely to be found. As one interviewee said, 'I have felt some problems with the modern school of marketing, to subordinate product development to the marketing department. I do not support that thinking. It doesn't fit in our industry. I think it's more for industries reading trends, dealing with product modifications and things of fashion. Then I can think of the marketing department as a driving force.' The interviewee seemed to consider this to be an industry–specific issue. Obviously, the structure of cooperation also reflected the problems associated with succession and with someone trying to take the place of the entrepreneur who started the firm. In a post–entrepreneurial transition, the change of setting is most radical when the past has not been fully substituted by the new era. 'When the retired entrepreneur goes into the R&D department and starts giving instructions and ideas', said one leader, 'the situation from a project management perspective goes out of control completely'.

It appeared that the problem was the entrepreneur, but that the root of the problem probably lay in the fact that the competent, able, and experienced entrepreneur was replaced by a CEO who did not possess all these characteristics. The structure of cooperation was shaken not only by the transition period caused by the exit of the entrepreneur, but also when driving forces in general retire from the team. Another dimension of the problems associated with the structural role appeared to be a lack of integrity on the part of the winning organization. To quote a managing director: 'It took 15 years for them to get it—that there is something unique and I wanted to protect Oscar Wood and his organization. I have had to *prevent* the marketing organization and tell the chief designer and his people what to do'. To some degree, the problem mirrored the difficulties associated with the boundaries of the formal and informal structures of the organization.

Beyond the role mix among the marketing, R&D, and production departments, there were, of course, myriad department–specific barriers. As the marketing department was the one most closely associated with the how the innovation was received in the market, it was often a mutual concern of the triad to reach out to the paying users. As one leader put it: 'There is a very long chain of middlemen between the factory and the end customer'. It enhanced the role of the sales/marketing function to manage the barriers reaching to the market. If it was thought that the job was completed in the R&D and production departments, the unfinished business of marketing was often required to take the blame. In the end it is only the market that can give the final merit points, however. Having been blamed for problems in the past, the marketing department may have covered the fact that the job of R&D and production had not met the standards of the market in the first place.

4.3.2 The Process Control

Process control covers systematization aspirations. The efforts are strongly driven by efforts to introduce and manifest a new order. In a sense, the process is the opposite of implicit habits, discussed previously. In this study, the order was explicitly expressed in terms of administrative *models* illustrating the message, *principles* governing key activities, *processes* formatting daily activities, and *formalities* supporting and sustaining the desired process behavior.

Operating models are a simple description of the system regulating how members of the firm are intended to operate. The power of the diagrams and schemes is in their simplicity; they build mental architecture in the mind. Their weakness lies in what the description omits.

Descriptions are diligently used to picture *processes* of activity. In moving from a physical work culture to intellectual work, there is a need to find efficient new ways of working and ways to avoid doing unnecessary work. Process description portrays such processes as production, innovation, commercialization, patenting, and training. The aim is to identify the same tasks and order of work in order to ensure that a quality outcome of the process arrives on time. There was criticism that applying the process thinking on an unknown journey with an unknown destination created ambiguity. As one chief designer said, 'If you draw up a process of innovation and start to work according to that, you won't be successful. Generally in invention, things don't go according to plan'.

Principles are another set of rules or ideas that induce the individual to behave in a desired way. It was remarkable that such principles as serial production, order–driven production, customization, and automation were constantly associated with the production of the firm. As one interviewee said, 'We have abandoned assembly, and we receive only complete products. The principle has been adopted in order to avoid work that we aren't qualified to do'. This statement voiced the principles of

division of work and concentration on existing qualifications. Principles worked here like a two–edged sword—in the long run like habits with a distinct direction. The drawback was that principles could have hidden consequences. Was it sensible, for instance, to focus only on what they were qualified to do?

Formal *procedures* are another way directing the behavior of the process. They are an accepted method and order of doing things, and include procedures for board approval, job descriptions, authorization of investments, piecework, and agreements. The formal procedures were found in every organization studied, although they were often mentioned in a low voice.

Patterns of Observations: The category of discussion associated with process control was one of the weakest categories of attention in this study, probably because the actors did not associate innovation and process thinking (see Table 49).

Player	Humanist	Plumber	Gardener	Guardian	Adventurer
L	M	L	M	L	L

Table 49. Cross–Case Comparison of Significance of *Category of Process Control.*

The various processes are best recognized in detail, although they did exist as an average. The impression received in the interviews is that process was used in the vocabulary as a black box: broadly applied, but narrowly understood (see Table 50).

Control	Player	Humanist	Plumber	Gardener	Guardian	Adventurer
Models	Product idea process scheme	Sales estimation model	Bonus formula	Innovation process map	…	…
Processes	Product development project, learning	Idea–to–launch, learning, teaming, order–to–delivery	Planning outsourcing transition	Creation encircle Customer Manufacturing Learning	Product development Project Patenting Decision making	Sales process Product development process Building prototype
Principles	Labor efficiency	Piece good production	Serial production	Automation	Production methods	Assembly optimization
Formalities	Job description	Job description	Signature	Investment limit	Authority approval	Work orders

Table 50. Cross–Case Comparison of *Observations of Process Control.*

The discussion of *processes* in connection with innovation seemed not to come naturally. As one interviewee said, 'The design process model is actually not a pure process, as visualized in the scheme. The actual realization scarcely flows according to the rationalized process description'. The term is used in organization development, and applies particularly to consultants imposing new measures of the formal domain of the organization. As the interviewee continued, 'Every time there is a new regime coming in they want to reorganize this development process. They come here and ask, 'What is your process?' We all look at these fancy diagrams, which leads to them say, 'Yes, okay, now you have it in order". It would be a mistake, however, to state that innovation is completely detached from the formal processes of the firm. To quote a managing director: 'The decision–making process failed, and poor judgment caused a huge loss when the unfortunate project was closed'. Just as the decision–making process served a purpose—preventing the business from folding—if processes are completely neglected, the integration of the new and the existing fails.

4.3.3 The Project Administration

My interviews covered the field of project administration, which is a one–time undertaking to achieve a goal. There was no distinct border between our discussions about the nature of a project and the nature of ordinary day–to–day activity. On a general level, the discussions mirrored not only various types of *projects* in the firm, but also the main phases of the project from *initialization*, p*lanning*, e*xecution,* and *project control.* Also connected to these discussions was life after the project, when the project became *integrated* with the ordinary daily activities of the firm, also called *organization–to–project* matters. Even though project administration was introduced as a medicine to cure innovation problems, a gap remained, preventing the fulfilment of successful innovation. As one of the managers said, 'The planned chance comes to help if you work eagerly enough. Chance favors the prepared mind. That is, you do not have luck unless you work hard'

The *project* is understood to be an undertaking with a destination. The term is also used to describe an undertaking to be distinguished from the ordinary daily activity. Time and again the interviewees used the term when talking about new product development. The projects were also frequently involved operations development, and the term was repeatedly used when discussing large customer project. 'Our ambition is to deal with big international, cross–border customer architecture projects', said one executive interviewed. The projects were also labelled by type: strategic project, parallel project, big project, product project, research project, or rationalization project. The labeling indicated that there were several projects being undertaken simultaneously, and projects come and go. As a project manager explained, 'If we have a new project, new initiatives automatically emerge from the successes of the previous project'. The point at which something assumes the form of a project is ambiguous. The following description is a consensus of the various the phases seen in the

case firms. Different firms tended to group different activities somewhat differently.

Initialization is an early phase of the project. As several undertakings were ongoing in the firms, the initialization phase served to legitimize the initiative. Although there was a formal assignment that officially started the project—the time when preliminary definitions and objectives are established—where and when the project was actually born was not distinct. As one leader said, 'We call it a project when the financing for the undertaking has been decided'. The formal decisions were clearly preceded by inquiries and analyses of the probabilities of success for the new product. The start does not always happen formally, but under cover. As a colleague continued: 'You do not always do what you are asked to do. A lot of good work has been done in the garage off the record'.

Once the start decision has been made, formal planning can begin. In this study, the project work formally involved briefings, agendas, building instructions, work breakdown, schedules, milestones, and resources. The planning phase included preparations for an uncomplicated execution of the project. Project execution efficiency was dependent upon good planning and preparations. To quote one interviewee, 'The building instructions speed up the building process, as you can call in materials at the right time and not interrupt the work'.

Plans are realized during the *execution* stage, which obviously overlaps the planning phase. During our discussions about the projects, the leaders focused most of their attention on execution, probably because the execution phase led directly to the destination of the project: the delivery. Concern about execution is what delivered the project results. The efforts were discussed on the managerial level, which concerns cooperation and progress. To quote one interviewee: 'When product development is done in several places, a great deal of coordination and documentation is needed to get things right, so that everyone is talking the same language'. Or, as another leader said, 'The implementing level relates to many types of duties We have looked into what children regard as having fun and have

tried to adapt our products to those findings.'

The issue of project controls flickered in and out of our discussions. The participation of several actors with several undertakings and different priorities resulted in the risk of duties not being fulfilled. Methods like schedule control, reporting, performance indicators, and feedback occurred as measures under control. Control appeared to be a controversial matter. If wrongly implemented it would have been counteractive. To quote one interviewee: 'You can exercise control by writing memos and blaming others, but it does not solve anything'. Properly and purposefully executed, however, control was a necessary ingredient. As one leader said: 'We have warranty matters always on the agenda to ensure that we listen to feedback about our products. We use the input for making product modifications'.

At the end of the project, the life of the undertaking departs from the status of a project. The *project closing/integration* and life after the project were reflected on the legacy organization—the organization that assumed responsibility after the project closed. One effect of new products was the cannibalization of other products within range. 'We want to cannibalize on our own products', one leader said, 'because we know that we substitute the sales to a better product.' New products replaced old ones. Another product–related issue was the spin–off projects and organizational consideration. To quote one leader interviewed, 'The development in the electrical locks boosted sales to the extent that it was reasonable to make it an independent business unit'. In this case, the success caused reorganization. Another form of life after the project appeared in the form of pressure for product alterations. Product development was usually not finished when the project ended, which resulted in interview statements like: We have inspections during the process, in order to cut down on later reworking when the product has been handed over.' As the life span of the project team was shorter than the product life cycle, further development was usually to a line organization, thereby reducing scrutiny of the development.

Patterns of Observations: Contrary to the discussion category of process, the discussion about the project seemed to link more naturally into the innovation discussion. On the whole, the category of discussion received above–average attention; yet it was not a significant area of concern in the upper levels of the management (see Table 51).

Player	Humanist	Plumber	Gardener	Guardian	Adventurer
S	S	M	M	M	M

Table 51. Cross–Case Comparison of Significance of *Category of Project Administration.*

One level—the execution phase—received significant attention across all cases. The execution was followed by the recognition of various types of projects, followed in turn by attention to planning and control. The least attention was paid to life after the project: namely, the integration phase (see Table 52).

Project	Player	Humanist	Plumber	Gardener	Guardian	Adventurer
Projects	New product research cheapen	New product public place cooperation development	New product Sales	New product technology, political cooperation, European Uni.	New product technology research group	Yacht building, new yacht
Initialization	Assignment	Briefing session	Product definitions	Home work	Objectives	Project proposal
Planning	Guidelines	Sales estimates	Resource load	Mile stones	Working order	Design brief
Execution	Engineering	Deal with material supply	Sales activity	Defend the actors	Schedule	Coordination
Control	Inspections	Feed back	Reporting	Completion control	Performance indicators	Plan tracking
Integration	Product replacements	Dismantle past practices	Product range termination	Spin–off projects	Project maintenance	Organizational integration

Table 52. Cross–Case Comparison of *Observations of Project Administration.*

One of the administration *problems* encountered in the high uncertainty projects was the risk associated with the deliverables. To quote one leader: 'We had our fiftieth anniversary on the doorstep, and the A studio had delivered no designs. Or they tend to do everything at the last minute. By Christmas we had to decide for ourselves; we went for Black Line. It was well received, but this was only buying time in the eyes of the public. Our design process is still a concern'.

Non–delivery was, of course, only one symptom of many. The opposite problem surfaced when the project did deliver, but what it delivered was not consistent with what management has defined as the business of the firm. As a managing director said: 'I usually don't interfere with the projects, but once a too futuristic and expensive project came on the table. It was debated in the management team meeting. The conclusion was that there was really no idea of a user for the product idea'.

Problems that lay between the two extremes came in many forms. It concerned the substance of the project, as well as the management constellation. An example of the first screamed for criteria. As one project manager complained: 'We have had difficult debates concerning the prototypes. It appeared that there had been no initial definition about the merits by which the prototype would be judged. We made failures, because the initial stage of the project was not set properly'.

The other aspect of getting it managed right required the interviewees to determine what was to be understood as a problem. As one said: 'We have concluded we have something particularly good here, that is not easy to put your finger on. When we start trying to go by the book, everything stops working! We tried it a couple of times, always with the same outcome. What does not look structured is not all that bad in the end, much to our surprise. It does not work well with strict structuring'.

The application of project management standards in innovation is not always the ideal. A good summary of the interviews could probably best be summarized as concern for the right timing for introducing project admin-

istration in innovation projects. If there were vital gaps in project administration, the faults became an issue after the project had been closed. That operation was usually managed by a functional organization that had inherited the responsibility after the project organization was dissolved. To quote one leader: 'It happens that we had to stop sales of a product until we have located the problem. We do not have 100% traceability of our products on the market, but we get a great deal back if we call for it'. As the example demonstrated, the firm confronted the problem through procedures for cleaning up the mess.

4.3.4 The Sales, Marketing Promotion

The discussion about sales highlighted the commercial dimension of the invention. The sales discussion stressed views about the *market in general,* as well as the more focused *target markets*. A matter closely related to the market was the discussion about competition. In this context, *marketing* was seen as creating the pull of consumer demand, whereas *sales promotion* was seen as a force to create and drive sales volumes. The *after–sales* discussion started when the deal was done. This discussion was from the perspective of the firm, which is the other side of the coin from the customer's perspective discussed in a previous section of the Empirical chapter.

The *markets* where the products would be available included the domestic market, export market, main market, and big market. The market in general was referred to as a geographical area or country. As one executive of case Gardener mentioned: 'In a market like our domestic, market, you need some 100,000 products to make enough noise to be recognized'. It was also common to talk in general terms about the furniture market, the playground equipment market, and other specific markets. It was also common to talk about the market as a black box, where products were absorbed: 'The Humanist Company perspective is based on this market and our heritage', said its chief designer. The

statement did not really reveal anything about who or where, however. The expression seemed to be used in situations in which the market was presented as a general variable in the discussion.

When the *target market* was discussed, some parts of the market were ignored. A narrow, well defined market was best approached after a distinct market need had been identified. To quote one leader: 'The slow fashion is a clearly emerging market niche'. The division of the market was commonly labeled in generic terms such as *segments*, *target groups*, and *niches*. The outline of the market was be given such descriptions as the youth market, high–end market, or art market. The cases all seemed to have distinct targets of higher priority. Humanist Company seemed to be able to gain access to the furniture market of projects through idealistic architects. Plumber Company sought sales to the private house builders through plumbers. And so on.

Marketing is about those acts reaching customers and stimulating the buyer to pay for the product or service. The market is primarily a crowded place of competitors. In a competitive market, it is necessary for a product to be seen and heard. A new product has a further requirement: to be understood. Our marketing discussion led to a discussion about sales and the earlier discussion about the appearance of the firm and its ideas. The orientation of the firm largely influenced the promotional tools it used to market its products and services. A sales–oriented firm like the Player Company tended to print catalogues and dealer materials, whereas a user–oriented firm like Adventurer Company tended to organize events like regattas. A mass–market–oriented firm like Gardener Company used mass media to reach its target group. A particular finding related to the first customer, a situation that occurred in several of the firms. The critical role of the first customer is clearly visible in the Gardener case: 'The first customer for our garden tools was Wal–Mart. We made it because of the backup of our US colleague, our cutting–edge technology, and low cost. That was the opening for our garden business'. The situation with the Adventurer case was similar. The first customers are critical to reach

enough end users, by lowering the threshold for those who are not the first.

Events could be included in the ordinary toolbox of marketing; they deserve special recognition, however, because they provide meetings of a special character. The event could be introduced in the context of the user, the location, the appearance, the customers, or sales. As an interviewee from Adventurer said: 'Yes, there are social events, events that we are arranging in the most fashionable places in the world: London, etc. There is a tendency for our customers to identify themselves by belonging to the special club that is fashionable these days—all people who love sailing—and living a lifestyle.' On one of the rare occasions that events entered into the discussion about the immaterial product features, one of the Adventurer interviewees said: 'There are people who like beautiful but reliable, real things, not fashionable things. In that sense, Adventurer Company is innovative, and more and more we are spending money in our marketing, especially for events'. So what would be the proper location of events in this line? Surely, the marketing context is one of them.

Discussions about sales promotion that took place during our interviews highlighted thinking about the sales process. The success of an invention was generally judged by how well it sold and how well it brought revenues into the company. The discussion covered a palette of products, promotional material, launches, customer calls, prices, arguments, offers, the transaction, and the delivery. The dream in this discussion was clearly to see sales soar. As a marketing executive explained: 'This year we have seen our sales take off. There is a conviction we have now found the right price level and the right range of products. Consequently the sales force has been activated'. As noted previously, customers and users were significant presences in any discussion about sales.

Once the product was delivered, concerns shifted to *after–sales* matters. The nature of after–sales marketing activity was diverse across cases. Nevertheless, the role of after–sales was generally seen as a continuance of the relationship with the customer, until the customer bought again.

Sometimes after–sales marketing was a matter of warranty or maintenance services for the product that had been delivered. Sometimes, in cases where the product was sold to retailers, after–sales marketing focused on concerns for point–of–sale visibility.

Patterns of Observations: The category of discussion addressing sales, including marketing, was significantly recognized in only one case—a case in which, on the whole, the discussion achieved only average attention (see Table 53).

Player	Humanist	Plumber	Gardener	Guardian	Adventurer
M	M	S	M	M	M

Table 53. Cross–Case Comparison of Significance of *Category of Sales and Marketing Promotion.*

On a detailed level, attention focused significantly on topics concerning the sales process and markets in general. With one exception, the pattern was consistent in both discussions. Table 54 focuses on marketing activities, matching the discussion about competition. Both after–sales marketing and events are accorded only marginal interest.

Sales	Player	Humanist	Plumber	Gardener	Guardian	Adventurer
Markets	Domestic main areas geographical	Domestic	Product geographical	Domestic geographical product	Domestic geographical product	Geographical product, potential clients
Targets	Housing projects	Idealistic architects	Water saving large audience, plumbers	Gardening adults	Public buildings	Racers and cruisers
Marketing	Catalogue	NY, London, Sthlm, Milan, exhibitions	Advertising, waterized demo stand	Reference gardeners	Testimonials	PR and relationship
Events	International sales meeting	Seminar speaker	Area sales meetings, PR	Design contests	…	Regattas
Sales	Product launch	Own stores, dealers promo	Consultative sales, price, training	Broad range	Dealer material, training	Built–to–order
After Sales	Assembly post–delivery	Dealer sales	Maintenance, warranty	Retail availability	Key supply	Warranty, calendar

Table 54. Cross–Case Comparison of *Observations of Sales and Marketing Promotion.*

The marketing/sales *barriers* were closely associated to those barriers introduced in the sub–section Functional Structures of the organization. The barriers of this category are also closely related to competition, which was brought up earlier in the sub–section on Customers. In general, the concern is reaching out to the market and to the many layers of actors that lay between the firm and the end user. An internal limitation was the propensity of the firm to employ means to promote itself in the market. As a marketing director said, 'It is remarkable that this company appreciates building brands and marketing, despite the fact that the firm has been manufacturing– and technology–driven for a very long time'. Things were often taken only half way, with some of the participants failing to take part in the joint effort. To quote a sales executive, 'There has been no lack of a sales–minded atmosphere, but maybe the execution has been missing'. Despite public attention, the concern was still that sales might not take

off when a novelty product has been launched, said another sales executive: 'The launch of Profile product range was well recognized publicly. However, the sales of this novelty product have not taken off; rather we sell more of our traditional products. We are a little stuck in the past', the sales director continued. And apparently the reason it does not work remains unknown.

4.3.5 The Economics

Business–level rationale is the final aspect introduced in discussions about innovation. One positively oriented discussion was about desirable factors like revenues—which were, of course, to be maximized—here labelled as *growth*. The opposite issue related to economic *stakes,* such as costs, which were to be minimized. Other related dimensions of the economic discussion referred to the *efficiency* aspect, *economic control,* and the *economic outcome* relating to the process of innovation in particular and business in general.

The purpose of *business*, it is said, is to make money. This discussion positioned innovation in the big picture of the firm. In addressing the operational constraints of making things happen, one managing director said: 'The point is that general management requires that attention be paid to other resource needs. We balance such needs as people, production capacity, and funds. An invention project is introduced into a situation that contains many priorities.' Looking at innovation in a business context, it was seen to be a driver, as another managing director clarified: 'The continuity of our business relies on our model, which is to invent and to meet financial requirements'. This discussion introduced the role of the business plan as a major determinant of priorities.

During the interviews, the discussion of economic factors focused on various aspects of *growth:* The more growth, the better the economy. The factors mentioned included growth in turnover, volume, order book, and cash flow. As one interviewee said, 'We can say that this is the year our

sales have taken off. Our growth for the touch–free faucet is 40% at the company level. Yet its share of total revenues is still not major. It is easier to believe in the product now, however, when revenues are significant and growing'. This statement briefly illustrated the vitality of sales growth, supporting belief in an innovation with a completely open future.

The statement 'the *stakes* are kept under tight rein', was expressed by several executives. The fewer resources used, the better the finances of the company. The stakes were such factors as investments, financing, and human resources. In connection to the stakes, the issue of risk entered the discussion. Risk was primarily associated with losing money, and, as a consequence, a loss in position: 'There is the fear and risk that things will go down the drain. Luckily the boss, or somebody else in the formal organization, has taken the responsibility and granted the financing', said one executive.

After these concerns had been dealt with, the interviewees' minds moved to the issue of the *efficiency* of operations, and various types of cost consciousness were addressed. Costs—including material costs, production costs, unit costs, cost structures, and alternative costs—entered the discussion. The direction of cost development was taken for granted; everything was about cost reduction. As one managing director said, '3D had better control over documentation. All in all, it provided product development with new tools for doing the work more efficiently'. Measures like rationalization, centralization, closing of factories, and cost reduction were also included in the context of invention.

Profitability appears to be the ultimate measure of success, and the ongoing activity of innovation. To quote one managing director: 'Our only true protector has been our good and steady profitability level through the years, and we have delivered something new every year'. It seemed evident in that light, that if there were no profitability, there was, in the long run, no financing. That is also to say that the good profit track record was a solid guarantee for the autonomy of innovating. There appeared to be a different level of measurement for profit. The phrase heard most often in

the interviews was about 'the bottom line'. Revenues and cash flow were also seen as contributing to the sustaining of innovation.

Economic control appeared to be well rooted in all the cases, a finding that corresponded with profit consciousness. The budget was a backtracking measure used in all cases. Traces of forward–looking tracking could be found in cases in which the accounting system tracked particular cost centers of the project. A risk–minimizing measure was used, for example, in cases in which the limits were applied for investments, and authorization was the way to stay on top of the resource usage.

Patterns of Observations: Despite the general goal of the firm to deliver profits, the economic discussion was only modestly recognized across all cases (see Table 55). The explanation probably lies in the fact that innovation, like costs, is not immediately connected to the firm's short–term profitability.

Player	Humanist	Plumber	Gardener	Guardian	Adventurer
M	M	M	M	M	M

Table 55. Cross–Case Comparison of Significance of *Category of Economics.*

On a detailed level, the economic discussion was significantly focused on the business considerations of innovation. The further the discussion led the subjects of growth and efficiency, however, the more likely was the business aspect to be discussed rather than innovation. Areas that received slightly less recognition yet an average level of recognition were investment and profit in connection to innovation. Economic control received little attention in the discussion about innovations (see Table 56).

Economics	Player	Humanist	Plumber	Gardener	Guardian	Adventurer
Business	Business plan	Core business	Earn money	Added value	…	Lots of money in the super yacht field
Growth	Sales growth	Chairs in demand	Faucet sales volumes	Turnover	Public market growth	Order book
Investment	Reallocation of resources	Competent resources	Sizable stake in electronics	Risk taking	Give training for free	Spending on R&D
Efficiency	Ineffective runners	Subsidiary synergy	Material cost reduction	Closing factory	Lean cost structure	Person–hour reductions
Profit	Good products give profit	Cash flow from operation	Cash cow	Good profit track record	Business unit earn–as–it–goes	Profitability is an issue
Control	Cost centers	Stock taking	SKU	Calculations	Biz unit P&L	…

Table 56. Cross–Case Comparison of *Observations of Economics.*

The *constraints* of innovation in association with the economic aspect were introduced as a long–term/short–term dyad. On one hand, there was a tendency to prefer short–term gains over long–term achievements—even to the degree, that there was pressure to divert from the strategy for quick gains. As one CEO stated, 'Managing and sticking to the business idea is a tough job. You can put anything on paper; it cannot be avoided, but there is a strong desire to sell and maximize revenues'. Equally, there are business conditions that are clearly predictable, yet distant in time. To quote a division leader: 'When I started as a leader of this Business Division, I thought, "This is the last time; we *should never again* have this technology situation, with expiring patents and no technical solution in the pipeline". Our business erodes, either through the expiration of patents or through competing technological development'. This situation was caused by a failed project that had led management in the wrong direction. The failing vision probably caused a shortage of patentable technical solutions. Similarly, the shift of business orientation was connected to the shrinking turnover and innovation, yet caused by the retirement of one of the key driving forces of innovation in the organization. As the acting

managing director explained: 'When Simon Storm withdrew from the company, the *patter of revenues* shifted. The firm changed from an international company to become the company of today, with predominantly domestic sales'. The connections that Simon Storm had forged between his network and the firm vanished with his leaving.

A *problem* on a lower level occurs if members of the management team lose sight of the big picture, and economic considerations steal their attention. As one of the leaders explained: 'Product development has been difficult over the past years. There was a desire for more collective decision making, but things were postponed because of excessive *cost calculations,* and we are stuck on the wall'. Balance seemed to be key when it came to numbers. The absence of attention to euros was probably not always the right way to go. 'We have always had funds for *investment*—developing new yachts—even when the company could ill afford it', said Adventurer's leader of the operations and R&D. At the same it was recognized that ends did not meet: 'We're good at designing yachts, but we're not good at manufacturing rationally. That's why we don't make enough profit'. For innovation to meet the business criteria, the economic discussion needs to include all the essential variables.

Summary and Connection to Theory

The categories of discussion associated with systemic and rational knowledge are the counterpart to the internal discussion of factors driven by individual will and reflection. The systemic discussion fits in a situation in which the environmental and external rulers of the firm are stable, unchanged, and foreseeable. The areas of discussion introduced in this domain were the *functional structures* of the firm and various *processes* that were programmed to work consistently toward the achievement of particular ends. These categories of discussion also introduced the managerial system for dealing with temporal activity (here labelled *project administration*) and the role of efforts to bring the new product from factory

to market (here called the *sales and marketing activities*). Finally, the whole discussion was focused toward the concerns for what the firm delivered at the end: the *economics,* financial results, and control of the firm.

The systemic domain of thinking was well explained by Cyert and March's (1963) theory of the firm. According to this theory, the firm is assumed to act rationality, to seek maximum profit, and to operate with perfect knowledge. Or, more specifically: 'The theory of the firm draws upon a view where the firm constitutes a coalition of multiple, conflicting interests using standard rules and patterns of procedures to operating under conditions of bonded rationality' (Cyert, March, 1963). As the organization by this definition seeks persistently to go from uncertain conditions to certain and stable conditions, this area of thinking probably has far–reaching consequences in the daily work of the firm. According to this theory, the organization uses standard operating procedures and rules of thumb to control uncertainty when making choices. As procedures are learnt and experience based, they are questioned only when procedures lead to wrong ends and failure. Consequently this assumes that these procedures dominate in the short run. Or as the general saying goes, 'This is how we have always done it; that is why we do it'.

This category of thinking in the empirical material, associated with the theory of formal organizations, could be defined as 'a system of conscious coordinated activities of forces of two or more persons' (Bernard 1938). The acts of the formal organization were defined more by the system than by the individual. It follows that the functional structures, the processes, the project administration, and economic control appeared like parts of the 'machine', keeping up the firms' organizations. It is be debatable if the sales and marketing efforts should have been seen as a whole. As the case was stated in the empirical material, however, it appeared that large parts were common tasks that could be performed regardless of who was the professional doing the job.

Finally, this category of discussion obviously related to the theory of the mechanistic management systems presented by Burns, Stalkers (1963).

Like the formal organization, mechanistic management style is best suited to stable conditions of the firm. In mechanistic systems, task and problems derive from the purpose of the firm and are broken down into specialist tasks. Every individual in this system has a completely individual task, as a part of all tasks of the whole, and somebody at the top oversees the relevance of everybody's efforts. In the mechanistic management system, people do only what they are asked to do. A fundamental conflict arises if wrong measures are applied at the wrong time, as demonstrated by the words of a chief designer: 'Usually something new comes up when you work long enough, provided you work unconditionally. In a direction, yes, but with loose frames, and a portion of disobeying or anarchy works too. That is not exactly what you are ordered to do, however'. Still, innovation management is not a question of either formal and mechanic, or informal organizations and organic management systems, but the challenge to apply the right mode at the right time. The following statement by a managing director demonstrated this point: 'Then an organizational structure is needed when you go in for implementing, like this should be completed 1st of September, as the exhibition starts the 2nd. Then we better forget the artistic, and we just get going, and that is when project schedules are in firmly in the picture'. The successful innovative firms appear to have mastered this sequential switching between organization structures and management system modes.

PART 5: ANALYSIS OF EMPIRICAL FINDINGS

The presentation of the empirical findings falls short of recognizing that some topics are of greater concern than others for those who lead the firm and innovation. The task ahead is to differentiate what is important from what is not. Furthermore, both the coding experience and descriptions of the empirical findings clearly point to an interrelationship among the categories. The analysis section therefore begins with highlighting variations in attention from category to category and to reveal the most significant associations among the categories. The scope of and how attention spreads across the domains of attention is then analyzed—the external rulers and the individual motivation–driven and system–driven discussions—as more time is spent talking with the leaders. Finally, the assumption of the most significant scope of attention is tested, to see if the leaders' scope of discussion reveals why one case is an ongoing innovative firm and another is not. This is done through the analysis of a condensed story and the associated barriers from each case. In this final exercise, the story is also connected back to theories presented in the Part 2: Theories, with the aim of distinguishing particular theories in connection to those stories, which may also have predictive value in explaining innovative versus non–innovative firms.

5.1 Matrix for Tracing the Critical Elements and Associations

The coded data serves as the basis for tracing the associations. The concept applied here has been influenced largely by the 'Design Matrix Method' (DSM) to analyze the patterns of thinking among the activists. It provides the possibility of tracing the *associations* and the *dependencies* of what is discussed on both a general level and a detailed level. The strength of the DSM is that it can represent an unlimited number of elements of a

system and expose the dependencies between the elements and patterns of dependencies.

Originally the DSM was as a method associated with managing the design and engineering of complex system (Pimler, Eppinger, 1994): 'The technique is useful for developing an understanding of the *system engineering* needs that arise because of complex interactions between components of a design'. The thoughtworlds of the leaders in this study are seen as analogous to and substitutes for the product system when applying the model. The full practice of the DSM method is not applicable, as described in the following, and only the basic features of the model are applied in processing the empirical data of this study.

The full use of the model goes through the following process:

1. Decomposition of the system into elements
2. Documentation of interaction among the elements
3. (Clustering the elements into chunks)

Applying the model in this work means that the coded text units represent the first step of decomposition of the mindset into elements. The second step, assessing the interactions among elements, is achieved through tracking the *intersecting text units* in the empirical material. The coded text sections and the use of the N6 QSR program provide a systematic, thorough, and wide approach to data mining. The third phase of the DSM cannot be logically applied to this study. Re–engineering technical aspects of system technical sequences may be alternated managerially. However, elements of thinking are not equally sensible to manipulate.

To discover the intersecting categories and properties, a matrix was established with the same 121 properties on the x–axis and on the y–axis. The diagonal of the matrix was excluded, as studying the intersection with the self is tautological—comparable to analyzing the dependency in a sentence like 'he sat alone with himself'. Processing the empirical material resulted in two matrixes—one detailed (see Figure 32) and one general (see

Figure 33). The general level is equal to the 'categories' and the detailed level represents the 'properties' describing the categories.

As Figure 32 demonstrates, the complexity at the detailed level exceeds the possibility of analyzing the material with this matrix alone. The colors in the picture also illustrate the variations in attention across discussions. Yellow indicates significant attention; white, modest recognition; blue, low recognition; and red, no recognition at all. It is also worth noting the alteration between grey and white lines on the x– and y–axis; those chunks of lines highlight the different properties of each category. The corresponding general level matrixes (Figure 33)—that follow from the analysis of the 121 properties—is presented as 24 categories of discussions about leadership of innovative firms.

Total

		USE			LOCATION				USERS										APPEARANCE					SOCIETY & SCIENCE							PARTNERS			MEDI.		INTERMED.						
		Activities	Experience (Sensation)	Resulting in	The Stage	Staging	The Arena	The Show	Individual(ists)	Common	Professional	Early Users	Object	Objects Collection	Product Concepts	Features ½	Engineering Structure	Reason for Being Perceived	Image Intended	Achievement	Research Discourse	Mode of Activity	Academic Actors	Movements in Society	Cultural Movements	Interests Aligned Actor	Proximity ½	Practicality	Make–or–Buy	Agents	Opinion	General Distribution	Client Businesses	The Individuals	Buyer	Prologue	Deliverables	Values*
1,577	Activities	0	340	562	433	453	491	220	147	430	103	120	550	168	617	582	612	189	218	190	97	160	85	113	42	149	71	60	0	197	17	138	163	58	250	227	183	36
761	Experience (Sensation)	340	0	296	133	116	258	155	71	260	35	28	271	43	209	244	295	218	141	51	25	52	14	3	114	70	0	11	0	53	6	40	17	45	26	125	106	8
1,054	Resulting in	562	296	0	322	275	377	97	81	328	37	8	363	42	405	487	464	138	134	46	73	122	70	55	69	108	0	13	0	30	0	48	8	43	210	144	181	0
1,051	The Stage	433	133	322	0	128	414	154	38	226	58	32	432	136	509	411	306	124	139	46	72	82	73	60	74	102	2	44	1	44	1	84	147	6	107	151	302	0
971	Staging	453	116	275	128	0	258	81	39	122	26	52	341	46	425	365	377	91	144	75	64	39	20	94	35	168	45	116	42	106	18	97	142	37	131	133	233	24
1,817	The Arena	491	258	377	434	258	0	402	143	314	116	133	737	234	578	642	484	172	464	155	105	93	51	213	170	230	59	49	32	231	42	243	365	106	443	295	330	0
768	The Show	220	155	97	154	81	402	0	94	139	90	42	262	78	245	280	222	127	161	113	41	8	8	52	67	171	31	39	0	127	34	94	118	0	38	79	102	0
586	Individual(ists)	147	71	81	38	39	143	94	0	258	60	7	184	81	259	124	61	91	202	43	20	24	43	57	79	168	20	72	35	135	26	80	92	39	150	41	81	59
1,610	Common	430	260	328	226	122	314	139	258	0	108	49	449	226	627	377	529	297	365	151	16	71	24	88	198	275	20	40	91	193	103	204	234	167	427	218	240	48
250	Professional	103	35	37	58	26	116	90	60	108	0	14	21	64	124	56	51	56	84	36	16	40	16	36	62	18	28	28	0	44	1	28	82	0	29	48	3	3
319	Early Users	120	28	8	32	52	133	42	7	49	14	0	152	9	39	13	18	16	84	31	40	40	13	16	12	57	39	25	0	101	27	30	20	18	65	29	63	0
1,887	Object	550	271	363	432	341	737	262	184	449	21	152	0	777	1,276	1,093	1,435	409	874	222	118	163	71	141	119	722	158	293	375	313	161	541	592	155	801	439	874	53
1,761	Objects Collection	168	43	42	136	46	234	78	81	226	64	9	777	0	490	350	372	158	390	172	18	84	48	32	13	430	53	143	113	89	63	155	281	37	255	187	220	0
1,678	Product Concepts	617	209	405	509	425	578	245	259	627	124	39	1,276	490	0	1,108	1,338	367	739	325	84	41	32	224	131	627	55	214	258	150	42	114	396	140	738	490	555	69
2,628	Features ½	582	244	487	411	365	612	280	124	377	56	13	1,093	350	1,108	0	1,231	230	576	247	65	139	62	150	103	492	31	176	162	203	75	172	257	48	484	303	421	13
1,298	Engineering Structure	612	295	464	396	377	484	222	61	529	51	18	1,435	372	1,338	1,231	0	191	556	212	47	79	87	98	82	507	89	90	291	105	19	228	199	151	475	340	352	85
1,272	Reason for Being Perceived	189	218	138	123	91	172	127	91	297	56	16	409	158	367	230	191	0	419	154	51	64	24	41	129	135	11	54	47	75	29	127	142	31	153	163	58	71
2,592	Image Intended	218	141	134	139	144	464	161	202	365	84	83	874	390	739	576	556	419	0	427	10	9	9	61	159	482	52	129	201	326	181	293	314	157	316	290	361	81
770	Achievement	190	51	46	46	75	155	113	43	151	36	31	222	172	325	247	212	154	427	0	1	1	1	12	14	107	0	61	46	107	77	89	142	43	30	88	110	25
262	Research Discourse	97	25	73	72	64	155	41	20	116	16	16	40	118	18	84	65	47	51	10	0	82	54	16	53	69	24	24	40	18	18	58	56	10	64	11	6	0
592	Mode of Activity	160	52	122	82	39	93	8	24	71	40	40	163	84	41	139	79	64	9	1	82	0	158	16	39	95	62	11	0	130	1	0	0	0	66	29	12	0
376	Academic Actors	85	14	70	73	20	51	8	43	24	16	13	71	48	32	60	87	24	9	1	54	158	0	51	32	117	45	25	23	44	1	0	0	0	27	23	1	0
581	Movements in Society	113	3	55	90	94	213	52	57	88	36	16	141	32	224	150	98	41	61	12	16	16	51	0	40	144	34	37	69	87	19	57	124	41	162	41	108	24
597	Cultural Movements	42	114	69	74	35	170	67	79	198	62	12	119	13	631	103	82	129	159	44	33	39	32	40	0	143	17	28	59	45	40	12	23	0	47	140	0	33
2,545	Interests Aligned Actor	149	70	108	157	168	230	171	168	275	18	57	722	430	627	492	507	135	484	107	63	95	117	144	143	0	273	151	407	282	75	172	257	48	484	303	421	13
570	Proximity ½	71	0	0	20	45	59	31	20	20	28	39	158	53	55	31	89	11	52	0	39	62	45	34	17	273	0	72	154	83	0	76	79	40	72	24	68	20
791	Practicality	60	11	13	12	116	49	39	72	40	28	25	293	143	214	176	90	54	129	61	24	11	25	37	28	351	72	0	370	67	6	147	161	38	135	69	134	24
1,086	Make–or–Buy	0	0	0	44	42	32	0	35	91	0	0	375	113	258	102	291	47	201	46	24	0	23	69	59	407	154	370	0	36	19	75	117	6	80	93	162	13
900	Agents	197	53	30	124	106	231	127	135	193	44	101	313	89	150	203	105	73	326	107	40	130	44	87	45	282	83	67	36	0	192	136	170	78	201	50	189	37
331	Opinion	17	6	0	1	18	42	34	26	103	1	27	161	61	42	75	19	29	181	77	1	1	1	19	40	71	0	6	19	192	0	33	33	19	53	13	92	1
1,278	General Distribution	138	40	58	84	97	243	94	80	205	28	30	541	155	314	172	228	127	293	89	18	0	0	57	12	121	76	147	75	136	33	0	766	427	417	144	342	55
1,452	Client Businesses	163	17	8	147	34	365	118	92	234	82	20	592	281	396	257	199	142	314	142	18	0	0	124	23	209	79	161	117	170	33	766	0	311	473	166	424	47
679	The Individuals	58	45	43	6	37	106	0	39	167	0	18	155	37	140	48	151	31	157	43	0	0	0	41	0	25	40	38	0	78	19	427	311	0	186	82	175	70
2,131	Buyer	250	26	210	197	131	443	38	150	427	29	65	801	255	738	484	475	153	316	50	16	66	27	162	47	298	72	135	80	201	53	417	473	186	0	442	460	59
1,364	Prologue	227	125	144	151	133	295	79	41	218	48	29	419	187	490	303	340	163	290	88	24	29	23	41	140	181	24	69	93	50	13	144	166	82	442	0	264	29
1,816	Deliverables	183	106	181	202	233	330	102	81	240	1	63	874	220	555	421	352	58	561	110	1	12	1	108	0	284	68	134	162	189	92	342	424	175	460	264	0	69
261	Values*	36	8	0	0	0	24	0	59	48	3	10	53	0	69	13	85	71	81	25	0	0	0	0	33	66	20	24	13	37	13	55	47	70	59	21	69	0
3,308	External	255	119	134	201	292	549	232	109	292	79	108	1,016	308	787	602	691	132	758	201	91	223	118	207	201	649	241	257	381	421	96	325	570	185	565	145	509	83
1,678	Inherent	158	56	82	96	106	252	86	88	138	71	5	438	187	432	361	509	77	338	175	9	54	70	84	76	307	11	133	13	149	81	18	44	84	27	166	47	251	35
1,782	Establishment & Leadership	81	58	0	83	75	156	103	64	79	24	0	789	361	563	215	483	132	355	158	24	72	18	28	69	468	111	174	129	74	0	287	181	90	256	218	230	20
1,816	Prevailing Situation	122	103	178	84	88	207	68	116	162	2	17	701	231	555	267	494	155	319	257	0	3	8	60	78	252	66	146	165	143	22	80	47	22	262	181	302	8
5,188	Self–Perception	289	298	227	236	317	581	206	188	508	23	61	1,482	598	1,396	691	1,152	412	1,047	350	26	88	22	168	259	1,109	164	264	407	380	135	442	468	192	700	450	750	124
1,740	Strategy Direction	211	68	57	105	93	262	59	126	168	34	19	414	275	527	213	446	154	453	104	0	29	26	3	80	281	82	34	98	39	0	146	161	68	220	168	197	50
3,534	Strategy Steering	438	266	391	194	331	521	98	160	372	33	114	1,276	306	984	645	941	227	517	202	85	95	6	123	192	569	134	181	221	235	124	264	347	195	600	383	487	98
1,476	Collectives*	79	53	45	80	13	64	74	50	150	1	16	431	126	320	199	364	173	325	103	35	87	11	32	6	247	9	91	105	75	1	95	42	1	180	65	40	0
1,678	Activist Characters	216	50	47	51	83	203	165	62	149	85	123	863	317	793	430	534	159	459	262	71	121	55	79	84	684	240	238	273	216	93	204	239	130	366	145	239	29
1,455	Fractional/Transitional	43	19	0	39	42	49	39	0	27	232	15	232	40	102	78	130	44	0	0	101	12	19	67	250	38	120	94	42	1	105	34	60	123	34	60	23	0
2,811	Trigger	232	118	177	249	138	394	168	124	229	17	80	1,031	404	768	501	751	166	531	93	1	70	45	91	88	399	110	177	235	168	48	208	293	103	399	250	381	55
1,667	Contact	91	35	29	58	68	212	106	140	168	17	58	465	192	419	182	280	60	434	211	1	19	21	65	57	405	74	198	157	204	101	264	296	138	342	173	235	80
1,394	Feeling	116	88	117	101	72	147	103	106	189	35	6	429	224	319	130	279	114	220	68	20	76	0	69	74	224	39	23	87	93	27	94	106	74	234	231	104	17
2,124	Thoughts	193	141	97	153	77	371	176	153	273	94	32	763	183	396	346	394	207	496	189	49	68	37	57	112	337	78	109	199	180	46	156	223	66	252	135	204	48
2,261	Dialogue	232	132	183	159	274	81	156	154	70	100	700	202	455	327	351	116	466	188	55	135	447	105	87	408	119	172	188	184	23	219	296	92	425	355	276	27	0
1,262	Participation	137	25	3	79	48	132	104	38	160	0	100	406	108	266	102	174	83	144	31	39	103	6	92	33	404	101	31	47	210	49	94	121	43	224	158	151	10
1,380	Processing	70	59	71	65	27	85	45	138	1	26	391	127	362	145	301	110	265	164	40	9	36	56	57	196	39	83	152	89	62	134	78	56	181	174	133	42	0
1,645	Prospective View	114	74	99	135	31	172	156	74	150	2	41	726	149	388	341	472	180	312	133	53	27	19	95	78	271	13	86	149	113	51	155	143	70	344	259	135	20
294	Force	29	29	29	0	7	19	14	0	0	0	0	92	20	32	35	67	0	40	0	0	0	0	0	0	0	0	0	0	0	0	54	37	25	16	0	15	0
2,271	Decision	169	57	98	62	76	152	35	35	260	11	8	388	168	348	305	259	503	133	358	171	47	121	55	101	58	305	79	239	218	57	236	229	12	344	166	22	20
3,302	Wakening of Idea	499	319	331	203	211	505	197	121	461	72	132	1,205	370	1,126	906	1,006	344	603	249	82	181	53	100	143	507	91	87	166	115	52	218	254	34	403	344	286	8
2,260	Requirements	520	189	360	167	346	434	132	113	446	62	54	769	288	972	488	866	947	270	528	175	55	136	37	161	91	466	74	139	126	196	21	181	189	121	400	356	439	28
1,838	Idea polku+C109	606	243	318	249	367	443	171	144	566	114	144	1,748	574	1,369	1,139	1,434	442	723	233	92	255	121	161	153	610	167	244	252	187	77	190	291	88	685	515	502	8
1,878	Means of Evolution (teot)	713	273	413	369	450	659	233	137	391	131	164	1,554	470	1,293	1,105	1,426	189	767	322	98	211	85	153	218	701	203	173	280	328	87	136	237	66	516	423	468	23
1,922	Industry Association	272	89	110	61	86	187	72	81	167	12	27	595	126	460	251	367	81	295	126	40	82	42	66	62	66	116	64	106	48	42	71	109	82	21	109	82	21
2,889	Community (strategy related)	182	129	102	158	136	301	130	41	259	67	23	874	322	704	556	696	298	541	236	75	107	26	59	146	494	175	154	179	232	55	153	133	55	302	185	227	71
1,890	Team	113	15	11	79	74	158	98	50	124	21	51	543	158	408	205	315	89	242	185	59	65	0	15	44	181	112	93	94	120	20	226	217	115	323	139	185	0
1,727	Individual	47	62	66	85	51	295	121	12	228	8	15	431	146	427	125	317	163	245	134	20	66	19	64	59	319	86	31	138	94	20	129	206	107	245	119	208	17
2,367	Habit	268	60	37	106	146	207	84	99	216	33	79	773	190	652	327	461	171	311	203	82	42	4	40	55	247	154	104	143	106	44	296	246	155	355	234	295	93
1,657	Documentation	92	25	50	42	33	24	70	61	124	16	12	159	89	221	147	159	42	53	36	19	43	8	0	36	247	74	71	70	28	1	14	21	0	121	115	71	0
444	Patents	71	65	40	0	0	0	0	0	0	1	0	176	78	170	166	170	23	76	0	0	62	0	23	0	24	2	23	59	0	0	23	44	0	17	27	72	0
830	Prototype	72	30	7	41	27	77	13	16	68	13	23	282	99	191	266	226	51	193	87	0	0	0	0	0	118	21	44	136	32	49	35	35	0	122	50	90	0
467	Laboratory	89	11	59	31	47	89	46	11	46	35	19	104	106	139	171	182	0	69	61	18	52	43	14	0	147	71	51	118	23	0	0	35	0	67	47	20	0
992	Premises	3	6	0	0	78	125	3	11	87	0	0	292	124	369	142	257	27	163	113	0	7	2	32	11	155	34	120	138	44	29	228	267	80	184	37	152	37
169	Trials	79	40	31	32	62	28	0	24	13	23	43	0	42	32	19	26	10	11	15	17	0	0	0	0	0	0	11	13	0	0	11	11	1	26	0	2	0
905	Tooling	67	0	101	49	150	72	0	19	0	0	0	388	101	271	226	354	38	180	1	1	19	0	23	0	279	54	122	196	59	0	52	120	0	42	49	204	13
110	Coffee Table	0	0	0	0	0	0	0	0	0	0	0	31	0	0	0	0	19	27	0	27	0	0	0	0	0	0	0	27	0	0	0	27	27	0	0	12	0
138	Response Group	22	8	0	11	2	0	0	11	44	0	0	58	0	61	13	0	15	15	0	0	0	0	24	0	14	14	14	14	41	19	41	41	41	48	46	46	13
138	Events	39	16	0	0	0	0	22	10	53	0	0	5	21	70	16	0	8	27	16	0	0	0	51	0	28	0	0	0	17	26	0	0	0	23	46	0	0
1,842	Abilities	391	139	293	201	277	489	191	122	423	57	99	1,340	330	1,082	726	1,059	397	532	151	139	242	100	177	178	741	214	358	385	278	45	320	410	191	711	423	517	20
745	Technical Skills	92	17	0	16	70	70	40	49	92	20	14	56	323	31	125	99	105	84	155	19	40	52	0	0	139	10	43	117	30	103	110	40	52	0	0	33	56
1,273	Competence Build–up	205	99	103	131	140	283	40	36	114	0	97	487	67	375	247	351	122	155	39	69	67	22	16	32	166	87	64	69	98	6	179	188	131	277	199	193	32
1,210	R&D	37	63	38	1	1	42	30	0	84	0	32	367	54	284	68	240	26	69	17	0	54	22	15	17	189	54	74	89	17	0	80	54	34	128	61	98	0
1,159	Marketing	110	24	81	18	52	132	17	24	161	0	18	444	100	352	78	182	114	296	56	0	12	12	21	18	89	22	64	68	43	19	231	217	43	306	135	168	36
3,118	Manufact. Process xx	326	87	274	152	291	288	95	75	269	52	30	1,341	338	1,250	797	1,116	222	565	194	54	69	39	111	58	583	130	384	625	68	20	341	118	63	380	243	497	60
1,080	Manufact. Machinery	170	19	124	37	244	79	0	0	39	0	0	448	111	361	144	320	47	115	65	20	30	5	51	0	230	17	76	182	41	0	70	94	12	92	50	119	12
1,494	Manufact. Principles	162	12	208	95	188	146	82	18	111	35	18	622	175	580	485	696	57	330	63	43	29	0	37	2	416	51	144	294	43	30	40	101	0	170	99	224	0
1,413	Operations Functions ½	73	32	57	46	79	104	58	26	62	27	0	505	186	362	268	280	37	214	125	0	51	23	0	57	184	90	116	105	64	57	162	262	75	261	169	332	16
288	Model	0	0	0	0	0	0	3	20	0	0	0	138	45	0	0	19	2	22	22	24	6	3	0	27	68	22	46	44	20	0	0	0	3	22	40	22	0
1,736	Process	43	18	39	108	20	107	69	10	88	2	40	504	145	256	197	235	254	189	81	42	115	37	47	52	226	49	98	107	82	60	82	172	74	215	126	177	0
367	Admin. Formalities	14	0	0	0	0	0	7	7	0	0	0	0	0	0	16	0	13	0	0	0	0	0	0	0	33	0	13	13	0	0	22	33	0	22	0	54	0
2,457	Projects	296	139	142	206	174	281	134	90	186	69	74	602	387	677	482	584	121	406	192	54	197	118	106	105	531	86	165	212	137	1	56	138	98	333	265	220	32
1,743	Initialization of Project	121	96	43	78	21	162	94	24	65	0	16	528	247	422	295	271	118	362	67	21	46	28	68	67	286	54	102	116	62	31	132	56	49	80	189	97	20
2,000	Plan of Project	113	57	35	76	61	155	57	28	118	16	92	612	170	489	289	392	161	342	113	49	102	12	43	75	362	71	132	149	139	104	118	170	53	282	311	181	8
1,828	Execution of Project ½	377	171	232	315	254	442	302	168	446	41	119	1,573	547	1,151	912	950	245	593	197	108	250	128	212	143	856	217	426	391	261	104	488	482	207	799	578	709	33
1,375	Control of Project ½	112	10	53	80	96	84	0	50	112	29	53	404	155	228	263	225	90	198	52	24	73	0	42	49	284	78	96	166	40	19	118	210	43	275	171	247	36
988	Integration	114	34	86	14	152	116	10	20	52	0	12	396	164	268	84	209	23	184	51	18	8	12	10	13	33	88	70	74	13	16	75	78	18	56	24	0	0
3,412	Markets	465	126	201	253	314	573	151	207	410	75	76	1,241	594	1,011	614	774	289	834	224	57	45	34	178	94	499	199	133	234	405	98	643	707	338	797	353	678	147
821	Market Targeting	170	29	80	142	29	222	67	106	281	60	17	203	235	259	190	220	170	297	162	18	10	21	66	85	138

	CONDITIONS						ACTORS			SKILLS						DIALOGUE & DECISION						IDEAS						SPIRIT						ARRANGEMENTS & PRACTICES																FUNCTIONS						TIME PHASES					
External	Inherent	Establishment & Leadership	Prevailing Situation	Self-Perception	Strategy Direction	Strategy Steering	Collectives*	Activist Characters	Fractional/Transitional	Trigger	Contact	Feeling	Thoughts	Dialogue	Participation	Prospective View	Force	Decision	Widening of Idea	Requirements	Idea pollun-Ci 09	Means of Evolution (text)	Industry Association	Community (strategy related)	Team	Individual	Habit	Documentation	Patents	Prototype	Laboratory	Premises	Trials	Tooling	Coffee Table	Response Group	Events	Abilities	Technical Skills	Competence Build-up	R&D	Marketing	Manufact. Process xx	Manufact. Machinery	Manufact. Principles	Operations Functions ½
255	158	81	122	289	211	438	79	216	43	232	91	116	193	232	137	70	114	29	169	499	520	606	713	122	182	113	47	268	92	71	72	89	3	79	67	0	22	39	391	92	205	37	110	326	170	162	73
119	56	98	143	298	68	266	53	50	19	118	35	88	141	59	25	59	74	29	57	319	189	243	273	89	129	15	62	60	25	65	30	11	6	50	0	8	16	139	17	99	63	24	37	48	35	0	67	0	3	0	12	32
134	82	0	178	227	57	391	45	47	0	177	29	117	97	132	4	71	99	29	98	331	360	318	413	110	102	11	66	37	50	40	7	59	0	40	101	0	0	0	293	0	103	38	81	274	124	208	57
201	96	84	84	256	105	194	80	51	0	249	58	101	153	183	79	65	65	133	0	67	82	73	169	61	158	79	85	166	42	0	41	31	0	51	49	0	11	0	201	16	151	1	18	152	37	95	46	0	0	0	0	0
292	106	75	88	117	93	331	13	83	39	138	68	72	77	59	48	27	31	0	76	211	346	307	450	85	156	74	51	146	33	71	27	47	78	32	150	0	2	0	277	70	140	1	52	291	192	244	188	79	0	0	0	0
549	252	156	207	581	262	521	64	203	42	394	212	147	371	274	132	85	172	17	152	505	434	443	659	168	301	158	295	207	24	0	77	89	125	62	72	0	0	0	489	57	283	42	132	288	79	146	104	0	0	0	0	0
232	86	103	68	206	59	98	74	165	49	168	106	103	176	81	104	82	156	29	33	197	132	171	233	91	130	98	121	84	70	22	13	46	3	28	2	0	22	191	0	40	30	17	95	0	82	58	0	0	0	0	0	0
109	88	64	116	188	126	160	50	62	29	124	140	105	153	156	38	45	74	14	36	121	113	144	137	62	41	50	12	99	61	0	16	11	11	0	0	0	11	10	122	40	36	0	24	75	0	18	26	0	0	0	0	0
292	148	79	162	508	168	372	150	149	39	229	168	189	273	154	160	138	150	0	260	461	446	566	391	161	259	124	228	216	124	0	68	46	87	24	19	0	44	53	423	49	114	84	161	269	39	111	62	0	0	0	0	0
79	71	24	2	23	34	33	1	84	0	17	17	35	94	70	0	1	2	0	11	72	62	114	131	0	67	21	8	33	16	1	13	35	9	13	0	0	0	0	57	0	0	0	0	52	0	35	27	0	0	0	0	0
108	5	0	17	61	19	114	16	125	27	80	58	6	32	100	100	26	41	0	88	132	54	144	164	0	23	51	15	79	12	0	23	0	0	23	0	0	0	0	99	56	97	32	18	30	0	18	0	0	0	0	0	0
1,016	438	789	701	1,482	414	1,276	431	863	232	1,031	465	429	763	700	406	391	726	92	768	1,205	769	1,748	1,554	245	874	543	431	773	199	176	282	104	292	45	388	31	58	5	1,340	323	487	367	444	1,341	448	622	505
308	187	361	231	598	275	306	126	317	135	404	192	224	183	202	108	127	149	20	348	370	288	574	470	71	322	138	146	190	89	78	99	106	124	0	101	0	21	330	31	67	54	100	338	111	175	186
787	432	563	596	1,396	527	984	320	793	293	768	419	319	396	455	266	362	388	32	423	1,126	972	1,369	1,293	225	704	408	427	652	226	170	191	139	369	42	271	0	61	70	1,082	155	375	284	352	1,250	364	580	362
602	361	215	267	691	213	645	199	410	40	501	182	130	346	327	102	145	341	45	259	906	866	1,139	1,105	195	556	205	125	327	147	166	266	171	142	32	226	0	11	16	726	99	247	68	78	797	344	485	268
691	509	483	494	1,152	446	941	364	534	102	751	280	279	394	351	174	301	472	67	503	1,006	947	1,434	1,426	226	696	315	317	461	159	170	226	182	257	19	354	19	0	0	1,059	165	351	240	182	1,156	520	696	280
132	77	132	155	412	154	227	173	159	78	166	60	114	207	116	83	110	180	0	133	344	270	442	189	160	298	89	163	171	42	23	51	0	27	26	38	27	15	8	397	0	122	26	114	222	47	57	37
758	338	355	319	1,047	453	517	125	459	130	531	434	220	496	466	144	265	312	40	338	603	528	723	767	272	541	242	245	311	53	2	193	69	163	10	180	0	15	27	532	155	155	69	296	565	135	330	214
201	175	158	257	350	104	202	103	260	44	93	211	68	185	188	31	164	133	0	171	249	175	233	322	81	236	185	134	203	36	76	87	61	113	11	1	27	0	16	151	39	39	17	56	194	65	63	125
91	9	24	0	26	0	52	35	71	0	1	20	11	53	39	40	5	33	0	97	82	55	92	98	7	18	0	13	0	0	0	0	0	0	0	0	0	0	0	19	16	6	0	0	0	0	0	0	0	0	0	0	0
223	54	72	3	88	29	55	87	121	101	70	19	76	68	135	104	9	27	0	121	181	136	255	211	50	107	65	66	42	43	62	0	52	7	57	19	0	0	0	242	52	67	54	12	69	0	29	51	0	0	0	0	0
118	70	18	8	22	26	6	11	55	12	45	21	0	37	47	6	36	19	0	55	53	37	121	85	80	26	0	19	4	8	0	0	43	2	0	0	0	0	0	100	0	22	12	12	39	0	0	23	0	0	0	0	0
207	84	28	60	168	3	123	32	79	30	91	65	69	57	105	92	56	95	0	101	100	161	161	153	39	59	15	64	40	0	23	0	14	32	0	23	0	24	51	177	0	16	15	21	111	51	37	0	0	0	0	0	0
201	76	69	78	259	80	192	6	84	67	88	57	74	112	87	33	57	78	0	53	143	91	153	218	85	146	44	59	56	0	0	0	0	11	0	0	0	0	0	178	49	32	17	18	58	0	2	57	0	0	0	0	0
549	307	468	202	1,119	281	550	247	684	150	399	405	224	337	468	404	196	271	29	305	567	466	610	701	270	494	181	319	247	262	24	118	147	155	10	279	0	14	18	737	119	166	189	89	581	230	416	184
241	111	111	66	164	82	134	0	240	38	170	74	39	78	119	101	39	13	0	71	91	74	167	203	38	57	12	86	154	74	21	21	71	34	0	54	0	14	0	214	117	87	52	22	130	17	51	90
257	13	174	146	264	34	181	91	238	120	177	198	23	109	172	31	84	86	0	79	87	139	244	173	42	154	93	31	104	71	23	44	51	120	13	122	27	14	0	358	30	64	74	64	384	76	144	116
381	149	129	165	407	98	221	105	273	94	235	157	87	199	188	47	152	149	0	239	166	126	252	280	66	179	94	138	143	70	59	136	118	138	0	196	0	14	0	385	103	69	89	68	625	182	294	105
421	84	74	143	380	39	255	75	216	42	168	204	93	180	184	210	89	143	0	228	115	106	187	328	116	232	120	94	82	33	34	0	59	0	41	0	0	0	0	178	108	98	48	68	41	43	64	0
96	18	0	22	135	0	123	1	9	1	48	101	27	46	23	49	62	51	0	57	52	21	77	87	64	55	20	20	44	7	0	49	0	29	0	0	0	19	26	15	30	6	0	19	20	0	30	37	0	0	0	0	0
321	44	287	80	442	146	264	95	204	105	208	264	94	156	219	94	134	155	34	236	218	181	190	316	106	153	226	129	296	13	23	35	0	228	11	52	27	41	0	320	74	179	80	231	341	10	40	162	0	0	0	0	0
570	84	181	47	468	161	347	42	239	139	293	296	106	223	296	121	78	143	0	272	254	189	291	237	58	133	217	206	246	21	44	35	35	267	11	100	27	41	0	410	110	188	54	217	318	94	101	262	0	0	0	0	0
185	27	90	22	192	68	195	1	130	60	103	138	74	66	92	43	36	70	25	122	34	121	88	66	42	55	115	107	155	3	0	0	0	80	0	1	0	41	23	191	48	131	34	43	63	12	0	75	0	0	0	0	0
565	166	256	262	700	220	600	180	366	123	399	342	234	252	425	224	181	344	16	344	403	400	585	676	71	302	323	245	355	121	17	122	67	184	26	42	0	48	46	711	117	277	128	306	386	92	170	261
145	47	218	181	450	168	383	65	145	34	250	173	241	135	355	158	174	259	0	196	344	356	515	423	109	185	139	119	234	115	27	50	47	37	2	49	0	46	0	423	73	199	61	135	243	50	99	169
509	251	230	202	750	197	487	40	239	60	381	235	103	204	276	151	133	135	15	252	286	439	503	468	82	227	185	268	295	71	72	90	20	152	2	264	12	46	0	517	33	193	98	168	597	119	224	332
83	35	20	8	124	50	98	0	29	25	55	80	17	48	27	10	42	20	0	20	8	28	8	23	21	71	0	17	93	0	0	0	0	37	0	13	0	13	0	20	56	32	0	36	60	12	0	0	0	0	0	0	0
0	407	698	442	1,419	385	848	299	709	322	844	531	284	537	582	312	441	387	45	521	586	513	834	1,124	250	619	540	352	573	193	81	156	136	500	79	251	31	14	26	1,118	189	262	314	322	958	264	326	544
407	0	478	298	759	207	506	159	372	150	274	168	113	265	246	128	170	162	57	248	461	395	551	643	133	347	190	255	265	170	143	76	48	81	40	41	7	0	6	617	60	158	268	72	549	175	280	152
698	378	0	498	1,595	500	787	463	940	323	617	338	377	393	543	353	381	364	121	444	624	278	679	776	104	792	721	505	676	144	111	82	60	284	46	148	39	3	11	816	84	228	400	358	758	177	161	358
442	208	498	0	955	288	691	182	541	189	459	196	204	424	503	155	204	311	66	344	522	459	616	640	137	560	403	302	559	84	111	47	8	141	19	42	19	16	5	644	151	167	181	114	560	119	175	188
1,419	759	1,595	955	0	931	1,317	543	1,152	649	986	744	436	781	766	604	661	767	166	708	1,158	750	1,334	1,552	358	1,145	734	750	739	236	214	113	42	449	59	299	65	21	16	1,595	234	442	464	468	1,382	288	431	573
385	207	500	288	931	0	437	166	321	126	372	161	142	300	263	110	174	286	52	371	452	299	455	532	139	333	245	208	368	66	30	56	13	220	30	57	0	0	3	560	72	259	117	200	378	73	183	177
848	506	787	691	1,317	437	0	319	775	317	817	317	408	518	619	440	551	441	131	682	916	757	1,219	1,292	185	895	556	604	584	279	220	115	79	315	5	249	19	0	0	1,154	217	416	369	311	1,152	523	495	401
299	159	463	182	543	166	319	0	464	280	300	253	113	204	297	158	149	177	29	135	337	247	447	408	33	359	361	223	278	113	40	53	26	126	65	26	27	0	11	640	95	278	221	215	412	8	55	48
709	372	940	341	1,152	321	775	464	0	560	687	616	449	530	826	375	378	440	122	598	779	438	973	1,065	137	758	634	474	739	333	137	273	124	276	18	163	66	8	42	1,312	282	225	375	290	877	190	350	357
322	150	323	189	649	126	317	280	560	0	255	240	107	237	164	279	181	136	22	158	266	159	296	324	23	192	245	223	231	73	42	45	40	99	26	0	0	0	0	102	130	134	163	260	64	85	133	0
844	274	617	459	986	372	817	300	687	255	0	431	288	446	591	190	334	354	71	547	681	642	1,116	1,098	115	760	472	382	459	219	125	172	131	162	8	270	32	8	8	1,035	107	148	309	313	983	327	317	316
531	168	338	196	744	161	317	253	636	240	431	0	165	345	579	271	401	156	0	337	264	187	349	423	73	345	466	308	429	154	0	164	43	287	13	72	39	32	16	535	119	192	157	168	357	84	45	194
284	113	377	294	436	142	408	113	439	107	288	165	0	289	348	174	164	175	43	265	274	263	315	356	140	411	355	399	326	163	56	73	36	25	7	56	0	24	0	553	86	117	27	72	172	51	93	152
537	265	393	424	781	300	518	269	710	267	446	345	289	0	441	262	385	500	92	522	586	231	589	810	36	573	375	196	509	76	7	106	101	193	34	50	0	0	12	775	114	240	239	185	435	35	107	182
487	246	503	291	826	164	591	159	348	443	386	71	607	557	259	154	329	344	386	71	607	557	259	154	329	496	450	554	216	77	177	51	117	176	12	134	37	22	5	915	191	298	182	161	411	118	345	115	122
312	128	353	155	603	110	440	358	575	279	190	271	174	262	440	0	143	244	18	264	291	230	574	374	55	254	313	272	291	140	41	66	12	62	40	0	62	8	0	612	236	270	148	46	251	0	41	221
441	170	381	294	661	174	351	149	378	181	334	401	163	385	344	143	0	432	18	464	317	159	374	413	46	346	323	160	342	38	43	79	57	126	26	40	19	19	0	507	71	150	144	214	284	48	88	114
387	162	364	331	767	286	441	177	440	138	354	156	175	500	386	244	432	0	79	501	479	184	633	545	115	370	291	232	324	105	12	108	76	92	4	85	19	31	0	781	112	89	147	292	388	111	162	174
45	57	121	66	166	52	131	29	122	22	71	0	43	92	71	18	18	79	0	72	112	43	96	79	29	103	58	35	79	1	0	41	0	15	15	14	0	0	0	81	8	0	17	14	129	32	33	14
521	248	444	334	708	371	682	335	598	158	547	337	265	322	657	291	264	464	501	72	593	491	803	790	87	455	456	378	487	214	111	211	44	133	15	139	0	22	16	795	189	196	198	204	586	246	245	172
586	361	624	527	1,158	452	916	337	779	266	681	264	274	586	557	291	317	479	112	593	0	920	1,603	1,369	210	658	392	354	613	399	288	270	141	187	40	209	46	6	3	1,095	164	318	265	283	916	349	435	243
513	395	278	459	750	299	757	247	438	159	642	187	263	241	259	230	159	184	43	491	920	0	1,142	924	221	492	335	223	342	173	147	166	266	171	165	47	55	20	24	3	902	90	267	172	142	863	175	485	160
834	551	679	636	1,334	455	1,219	447	973	296	1,116	349	315	589	744	574	574	633	96	803	1,603	1,142	0	1,649	279	864	664	499	753	421	350	378	257	188	58	244	47	51	24	1,753	257	435	538	310	1,326	342	582	271
1,124	643	776	640	1,552	532	1,292	408	1,065	324	1,098	423	356	810	649	374	413	545	79	790	1,369	924	1,649	0	240	925	585	412	827	375	235	319	265	331	110	382	50	27	39	1,455	252	429	431	323	1,241	431	516	387
250	133	104	137	358	139	185	33	137	23	115	73	140	36	50	55	46	115	29	87	210	221	279	240	0	172	101	269	132	11	0	32	14	61	1	45	0	24	0	339	99	53	70	51	213	55	125	113
619	347	792	560	1,145	333	895	350	758	192	760	345	411	573	616	254	346	370	103	455	658	492	864	925	172	555	628	569	556	142	144	148	154	28	226	20	13	23	198	108	273	202	152	777	301	212	257
540	190	721	405	734	245	556	161	654	245	472	466	355	375	490	313	323	291	58	456	392	335	664	585	101	555	0	427	621	143	54	111	40	122	3	30	27	0	0	694	135	147	166	191	529	345	87	215
442	208	498	0	955	288	691	182	541	189	459	196	204	424	503	155	204	311	66	344	522	459	616	640	137	560	403	302	559	84	111	47	8	141	19	42	19	16	5	644	151	167	181	114	560	119	175	188
72	625	122	288	531	142	467	364	395	1,220	230	1,071	544	1,266	223	2,095	963	791	784	512	195	541	415	408	226	127	135	1,622	456	251	233	298	39	40	229	2,346
0	130	0	223	226	203	499	133	149	664	46	347	189	470	30	783	329	315	335	146	0	199	80	128	112	57	135	503	221	36	9	69	27	10	45	719
71	399	35	356	362	562	1,157	415	293	849	160	661	571	815	192	1,226	605	421	479	220	46	343	471	370	87	104	471	1,222	466	311	283	186	10	26	212	1,716
51	296	0	479	187	379	604	243	71	27	75	125	130	217	56	393	117	102	134	28	57	120	109	115	0	61	254	449	184	75	53	168	16	12	82	638
15	414	123	612	454	611	1,282	310	216	441	91	266	570	634	107	898	440	417	385	209	138	433	175	288	89	55	410	1,008	409	259	553	211	17	45	120	1,356
36	350	59	272	165	205	573	142	130	227	20	23	186	55	200	199	101	104	111	24	240	42	133	20	1	298	461	191	28	28	24	0	33	20	1	0
9	290	95	723	571	424	1,143	299	216	637	169	410	561	882	71	1,022	657	335	576	185	161	331	316	240	142	109	259	811	490	178	250	183	25	121	84	1,409
22	145	17	392	196	272	578	220	148	481	86	143	138	343	53	67	191	131	143	59	119	199	675	98	99	52	67	28	43	0	670	0	0	0	0	0
47	132	25	202	249	175	457	119	92	232	56	214	252	273	71	388	146	131	79	110	56	181	157	76	40	51	226	438	204	61	46	72	0	16	40	928
90	251	55	334	238	200	711	282	70	535	238	366	451	489	106	786	308	344	246	188	96	328	143	126	44	42	207	543	165	48	71	99	13	0	66	1,089
29	177	66	289	319	340	734	272	172	365	48	313	344	523	46	1,329	353	0	424	248	128	225	129	105	122	46	30	534	177	142	214	87	27	17	1,007
44	119	121	356	384	332	645	181	288	486	96	543	179	667	34	1,613	471	424	0	248	117	274	132	137	106	121	130	558	261	199	266	141	10	94	23	899
3	104	116	72	210	75	285	36	91	185	15	201	46	231	0	772	452	248	238	0	175	156	106	5	0	13	104	382	125	17	35	49	10	0	48	455
26	71	29	33	41	52	53	18	24	16	67	56	98	118	24	180	74	118	42	54	45	80	54	52	159	19	84	121	182	128	175	118	66	16	0	218
44	233	33	302	141	192	491	269	163	310	126	189	232	414	31	690	323	225	274	156	118	0	128	256	191	58	162	544	161	32	52	42	4	0	24	725
21	115	88	319	87	155	432	192

	Categories	External Rulers										Motivation–Driven *(internal factors)*				
		Use	Location of Use	Users	Products	Appearance	Society & Science	Partners	Mediators, Opinion Shapers	Intermedians, Middle Men	Customer & Competition	Leadership Preconditions	Activists	Decision Making	Invention	Spirit
1,986	Use		1,460	960	1,986	768	589	324	247	283	826	1,434	977	1,168	1,374	549
2,714	Location of Use	1,460		893	2,714	1,056	681	733	393	643	1,352	2,338	1,393	1,723	1,778	1,076
1,717	Users	960	893		1,717	878	523	566	443	497	1,095	1,474	1,090	1,369	1,321	649
7,144	Products	1,986	2,714	1,717		2,728	1,426	2,591	675	1,376	3,288	7,144	5,808	5,793	6,285	3,013
2,728	Appearance	768	1,056	878	2,728		436	794	428	592	1,143	2,599	2,058	2,147	2,072	1,196
1,426	Society & Science	589	681	523	1,426	436		508	280	176	597	1,199	1,020	1,055	1,120	550
2,711	Partners	324	733	566	2,591	794	508		368	487	1,086	2,711	2,617	2,183	1,799	1,145
766	Mediators, Opinion Shapers	247	393	443	675	428	280	368		199	424	766	589	750	502	401
1,709	Intermedians, Middle Men	283	643	497	1,376	592	176	487	199		1,081	1,558	1,083	1,264	740	713
3,288	Customer & Competition	826	1,352	1,095	3,288	1,143	597	1,086	424	1,081		3,044	2,142	2,647	2,329	1,261
7,144	Leadership Preconditions	1,434	2,338	1,474	7,144	2,599	1,199	2,711	766	1,558	3,044		7,016	6,446	5,557	3,936
7,016	Activists	977	1,393	1,090	5,808	2,058	1,020	2,617	589	1,083	2,142	7,016		6,234	5,089	3,605
6,446	Decision Making	1,168	1,723	1,369	5,793	2,147	1,055	2,183	750	1,264	2,647	6,446	6,234		4,983	3,768
6,285	Invention	1,374	1,778	1,321	6,285	2,072	1,120	1,799	502	740	2,329	5,557	5,089	4,983		2,626
3,936	Spirit	549	1,076	649	3,013	1,196	550	1,145	401	713	1,261	3,936	3,605	3,768	2,626	
3,520	Practices and Arrangements	818	957	790	3,520	1,157	490	1,425	354	725	1,572	3,493	3,389	3,229	3,204	1,902
3,851	Learning and Skills	691	1,027	714	3,545	1,111	716	1,337	343	725	1,581	3,845	3,851	3,543	3,047	1,931
5,078	Functional Structure	691	1,126	705	4,666	1,406	559	1,843	291	1,023	2,008	5,078	4,368	4,017	3,659	2,187
1,641	Process Control	64	276	159	1,291	448	230	373	110	236	550	1,547	1,641	1,360	1,341	736
5,789	Project Administration	1,036	1,676	1,034	5,470	1,527	1,199	2,113	568	1,191	2,544	5,789	5,358	5,186	4,783	2,802
5,802	Sales, Marketing Promotion	1,301	2,017	1,583	5,802	2,410	841	1,747	708	1,709	2,988	5,517	4,162	4,628	4,013	2,449
5,072	Economics	891	1,468	777	4,686	1,642	636	1,438	401	1,078	1,971	5,072	3,904	4,006	3,667	2,351
5,982	Time Factor	1,064	1,776	1,252	5,651	1,927	1,054	1,884	461	1,081	2,308	5,982	5,214	5,031	4,751	3,167
4,902	All Barriers	814	1,270	839	4,156	1,501	571	1,292	353	874	1,822	4,902	4,167	4,110	3,542	2,528

4,111 / Average
2,045 / Deviation

Significant attention: x > average + standard deviation

Modest recognition: x within standard deviation

		Rational Systemic *(internal factors)*					Generell	
Practices and Arrangements	Learning and Skills	Functional Structure	Process Control	Project Administration	Sales, Marketing Promotion	Economics	Time Aspects	All Barriers
818	691	691	64	1,036	1,301	891	1,064	814
957	1,027	1,126	276	1,676	2,017	1,468	1,776	1,270
790	714	705	159	1,034	1,583	777	1,252	839
3,520	3,545	4,666	1,291	5,470	5,802	4,686	5,651	4,156
1,157	1,111	1,406	448	1,527	2,410	1,642	1,927	1,501
490	716	559	230	1,199	841	636	1,054	571
1,425	1,337	1,843	373	2,113	1,747	1,438	1,884	1,292
354	343	291	110	568	708	401	461	353
725	725	1,023	236	1,191	1,709	1,078	1,081	874
1,572	1,581	2,008	550	2,544	2,988	1,971	2,308	1,822
3,493	3,845	5,078	1,547	5,789	5,517	5,072	5,982	4,902
3,389	3,851	4,368	1,641	5,358	4,162	3,904	5,214	4,167
3,229	3,543	4,017	1,360	5,186	4,628	4,006	5,031	4,110
3,204	3,047	3,659	1,341	4,783	4,013	3,667	4,751	3,542
1,902	1,931	2,187	736	2,802	2,449	2,351	3,167	2,528
	2,093	2,650	871	3,051	2,423	2,128	3,101	2,366
2,093		2,593	1,026	3,141	2,356	2,113	3,048	2,204
2,650	2,593		1,025	3,809	3,351	3,424	3,990	2,875
871	1,026	1,025		1,412	892	843	1,300	1,089
3,051	3,141	3,809	1,412		3,941	3,618	4,860	3,747
2,423	2,356	3,351	892	3,941		3,881	4,204	3,440
2,128	2,113	3,424	843	3,618	3,881		3,843	3,293
3,101	3,048	3,990	1,300	4,860	4,204	3,843		3,522
2,366	2,204	2,875	1,089	3,747	3,440	3,293	3,522	

Low significance: x < average – standard deviation

Figure 33. General Level Matrix of the Categories.

As these matrices illustrate, the cluster of discussions about the *conditions*, *actors*, *invention*, *decision making*, and the *product* are the *categories* that generated the greatest attention; furthermore, the categories also highly interrelated. The second layer of attention expands the picture of recognition when the most *associated* categories become visible through the matrix. When more time is spent on the subject of leading innovation, the discussion most likely diverts to the additional aspects of *sales*, *project*, *organizational functions*, *economics* and to *spiritual* aspects.

This finding is built on an fundamental assumption of this book: *The leaders would spend most of their interview time on the topics that concern them most, in the light of innovation activity. Furthermore, it is assumed that the time they would spend on the interview topics reflects how they aspire to spend most of their time when they master the activity of innovation in the firm.* There is a limitation to this line of reasoning: It is possible that matters that could have a fatal impact on the firm are omitted from the discussions. Validity and reliability was discussed in the Part 2: Methodology. The further analysis of the associations is limited to those topics and connections on which the interviewees were most likely to focus: at this point, potentially, the critical element sustaining the state of innovation.

5.2 Actor Network Theory—Interpreting Associations and Causality

On the detailed level in the empirical material, various discussions are linked as a long chain of associations and are spread out into branches. It seems likely that the answer to the research question is not absolute, but a relativistic statement. As Latour (2005) states, 'situations where innovations proliferate, is where group boundaries are *uncertain*; where the range of *things to be taken into account* fluctuate'. By 'group boundaries', Latour is referring to the bundle of items—properties or categories of the empirical material in this study—that together stand for the phenomenon.

Hence, it does not seem sensible to search for the answer to the research question by merely studying isolated elements. It appears that it is the combination, the relationships, and the forces among the elements that matter. This section presents a brief interpretation of Actor Network Theory (ANT) and how it is applied to interpret the empirical structure proposed in Part 4: Empirical Observations. Choosing ANT as a tool to interpret innovation is based on the assumption that innovation is also a social phenomenon. This section builds primarily on Latour's book, *Reassembling the Social—An Introduction to Actor Network Theory* (Latour, 2005).

ANT appears to be a sensible and unconventional approach to interpreting and describing the associations among the *critical* matters, as adding up to the phenomenon of innovation leadership. *ANT* is a method concentrated on *associations,* also called the 'sociology of associations'—not on the categories 'actor', 'invention', etc., but on the connections among those categories (see Figure 34). ANT is not actor–centric, but activity–centric; it centers on the flow of activities and their associations. ANT supporters criticize the 'social explanation', 'context', 'macro', and 'global' as sloppy, leaving out the vital description. ANT is being used in this study to locate those discussions at the center of the thoughts of the key players. The central position assumes that those critical elements represent the shortest distance to all other thoughts, even the more peripheral. In this study, I have attempted to see the Pareto effect of 20/80, where a few (20%) of the discussion topics connect to the majority (80%) of all thoughts presented in the interviews, thereby revealing the essentials of the phenomenon of leading innovations in mature firms.

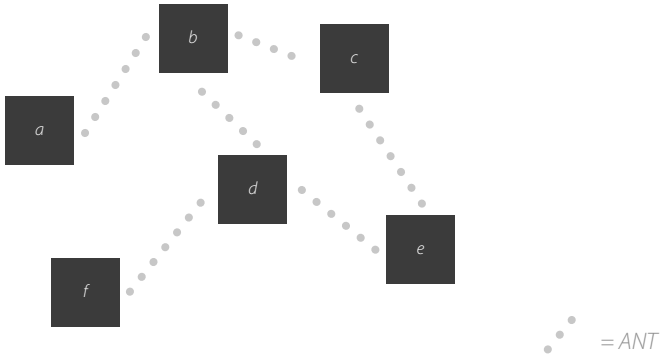

Figure 34. Illustration of Actor Network Theory.

A debate in the ANT literature centers on the controversy between the macro and the micro. As the labels 'actor', 'network' and 'Theory' indicates, the *actor* is the core of the concept. The term *actor* refers not merely to the socially oriented person, for actors can also be objects, or anything non–human that is followed by some effect.

Even a roof tile can be an actor, because the tile was part of a social act when the bricklayer built the house; it was the object of the bricklayer's act. For many years, each tile was fixed in its place, to the concern of no one. One windy day the tile fell from the roof and hit a pedestrian on the head. Now it again became an actor of a drama. Because of the tile, the pedestrian fell to the ground, unconscious. A fellow pedestrian stopped to help, and concluded that calling the ambulance was the right thing to do. One driver and two doctors became involved, and concluded that the pedestrian was dead. The pedestrian was sent to a clinic for post–mortem research, which engaged a pathologist. Following the incident, the relatives were informed, and suffered severe emotional reactions. Nevertheless, according to Jewish tradition, the funeral took place the next day. The whole chain of events started from the object—the roof brick—which had dramatic and clear consequences.

Sayings and people's words that lead to an event can cause similar strings of activity and causes and effects: an actor is doing something, making some difference to a state of affairs. The ANT world is populated by *intermediate actors*, by *mediating actors*, and by *spokespeople of the group*. They leave different traces behind them; they have different effects on their environment. The intermediates plainly transfer the meaning or effect forward—like the pedestrian in the example who simply conveyed the message of a man lying on the street. Mediators reshape the effect or meaning of the interaction in some way. One actor may have many faces: a secretary, a sister, a mother, and a wife, all in one person. The 'hat' that the actor wears has an impact on the interpretation of meaning and consequences. What counts is not the figure, but the range of mediators an actor is able to deploy. Latour suggested that, in order to learn if we are talking about causes and their intermediaries or about a chain of mediators, we should follow the natives, the figuration they are endowed with, and through which mode of action are they engaged. Figures 32 and 33 present a proposal of which are 'the actors' of leading innovations according to the ANT. The next analysis, following this description of ANT, attempts to isolate the most relevant elements of that leadership and the causal relationships among them.

The *network* component of ANT gives a narrow conception, as we ordinarily understand the term, of the phenomenon. Actors are connected through a widespread bundles of associations. However, the focus in ANT is on 'what works in the net'—those movements that connect cause and effect between two actors. *A good ANT description is a string of actions in which the participants are more often mediators than intermediates; a good narrative in which as many actors as possible are doing something* (Latour, pp.128, 2005). The network is an expression of the amount of energy and movement that is captured in a good ANT description. If there is no movement, no effects, then the phenomenon of ANT is not visible. The analysis of the actor will reveal the space in which the ingredients of the world begin to emerge; the analysis of the network explains which traces,

trails, and type of information are being brought inside those places. In this work, the time line of historical innovations of the firm is used to introduce those works that have comprised the various innovations along the way.

The challenge is to detect associations, as the phenomenon according to ANT is visible only temporarily. Groups, as opposed to an individual, introduce much greater uncertainty about the effect that the group produces. Groups also have the powerful role of bringing in the unexpected, as demonstrated by the research of promotors referred to previously in this book, in which the combined effect of two or three promoters probably creates more radical innovations than one promotor does. We are inclined to think of groups of actors as always being there, yet, they are alive only during the formation or reformation—in the making or breaking, or in the defense of the group—otherwise they are dormant actors. Groups exist when they *perform and are at work;* that, rather than the group as such, is what counts. Groups are constantly challenged by anti–groups, which is why the survival of a group formation is not evident.

An example of the matter of groups can be seen in the presentation of a CEO of a large company referring to the unfinished work of integrating the former organizations five years after a merger. He declares that the promotion of a 'common culture' is in progress. The spokespersons act as promoters of the group identity. Because of the mediating forces, the dynamic meaning of the group is under constant revision, according to ANT philosophy. Why had a common culture not materialized? Upon what supports is it built? The social phenomenon of innovation relates to the same questions. Theory previously discussed in this book suggests that there are informal coalitions to listen to, to deploy controversies of the question. The work in this book builds on the fellowship of those who have performed the act of innovation. Evidence of their view and the contribution of the actors can be found in the case descriptions, and in the numerous quotations of the activists in this book.

According to ANT, a further challenge occurs when asking what and who acts when we are acting? '*Action* is transported presence' (Latour, pp.128, 2005); an actor may be what is *made to act* by many others. Action is dislocated in time and place, as is visible in the saying, a common complaint why results of innovation are absent: 'Why is it that I never have time to do what I planned to do and ought to do?' Clearly the origin of action is one of the great uncertainties, as it is, by definition, dislocated. When one studies action, it turns out that it is a highly shared by, associated with, and influenced by a conglomerate of many surprising sets of other agencies. Referring back to the example of the pedestrian who called he ambulance, as an act it was programmed in advance by the Jewish norms and traditions that the dead should be buried as soon as possible. The funeral was legitimized by an ambulance doctor, with the doctor's instructions, and by an autopsy prescribed by the medical science.

As an ANT theorist would point out, there is a large gap between the premise and the consequence. As actors are engaged by different group movements, they provide the actors with a controversial explanation for their actions. ANT proposes that the course of action rarely consists of only human–to–human connections, but involves a zigzag chain of one and the other. Non–human actors do not determine action, but it makes a difference in the course of the chain of and a person's action. The social ties of objects are momentarily visible, then recede into the background, perhaps to pop up again later. The limiting implication of the forthcoming case description is that no description will be fully able to deploy all the controversial aspects associated with the description of an phenomenon. It would be like describing an eternal chain and a web of associations.

Latour suggests going beyond the 'matters of facts' (Latour pp.87, 2005) when dealing with the actors, arguing that the facts are fabricated and sustained by certain mechanisms. 'Do not take anything for granted', he says. Science offers several opportunities to follow the facts as they are formulated where matters of facts end up as cold and routine 'black boxes'. Mechanisms like grant applications, laboratories, large–scale experiments,

congresses, publications, and consensus conferences contain information that questions the ontology. Going beyond the matter of fact—looking into 'matters of concern'—assumes the relativistic nature of facts.

The concepts presented here—the actor, the group, the objects, the concerns—are all argued to be sources of uncertainty, causing states of instability that are the breeding grounds for innovation. On one hand, their analysis may provide insights into the effects of hidden factors, which cause unpredictability. On the other hand, the insights also introduce the simultaneous possibility of initiating positive effects of inexperience such as reconfigurations, reformation, or as they are more commonly called: innovations.

5.2.1 Applying Actor Network Theory in the Study

ANT goes beyond the usual sociological meaning of *actor*, by also embracing the object as an actor. This thesis further stretches the meaning of actor to comprehend the *notions*—ideas, beliefs, opinions, conceptions—as the intellectual equivalent for the actors and objects making a difference in the state of affairs. Ultimately, ANT is about the span between the macro and the micro, the context and the local, the many and the one. If the topic of this thesis is *innovation leadership*, then what is the micro of innovation leadership? If we take the advice that the interaction among factors of innovation leadership is an overflow of many ingredients already in place from other times, other places, and other agents, it is suggested that we 'move away to some other sites to find the sources of those ingredients' (Latour, 2005).

What does that mean in this study? The first move was to 'localize the global' (Latour, pp.172, 2005), to see what led from the local interaction to context: the relationship between the many and the one. Applying ANT in this work required to 1) 'decompose the global' text body of 230,000 words into the 'local' equivalent of 6,000 key words. The second move was to 2) sort out all the locals, or to 'redistribute the local' (Latour, pp.191,

2005), in order to understand the abstraction connected to the action: analyzing distances between various points of view. In this text, this step amounted to creating the logical categories and properties of the text body. 3) The last step was to 'connect the sites' (Latour, pp.219, 2005) showing what comprises the associations understood as 'innovation leadership' by the activists. This work required me to go back to the research questions: Which areas of attention helps to maintain a state of innovativeness and the cycle of innovation? And, what are the dependencies? As a result, the macro 'Leadership of Innovation' is not described as a wider site or domain, but as many equally local, equally micro places connected with each other. The manoeuvre is illustrated by applying the method on the same Figure 35.

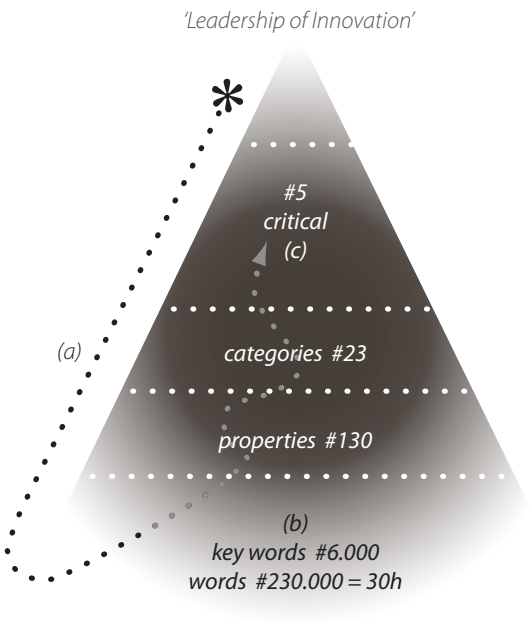

Figure 35. Reassembling the Holistic Notion 'Innovation Leadership'.

Following is a description of ANT is applied to the interview data. Firstly it takes the form of an description of the dependencies between the critical areas of attention. Secondly it takes the form of six stories, describing the innovations in the six firms studied. To quote Latour (2005), 'A good actor–network–account is a good description'—if the narratives prove to be *good stories that make a difference to the reader*, considering the research question—then a good ANT account has followed from applying the method.

5.3 The Critical Elements

The following illustrations of the primary and secondary dependencies, are complements to the Landscape Figure 31 presented in Part 4: Empirical Observations. This study suggests that the prime areas of attention of the leaders are the dependencies between the preconditions of leadership, the activists, the decision making, the inventing, and the product (see Figure 36). This suggestion is based on the results of the analysis in Figures 32 and 33, the matrixes of categories, which highlight the fact that these topics are the ones that were most often discussed and that they have the most significant interdependency. This does not suggest, however, that these would be the only dependencies of significance. The extended analysis of the critical discussions will expose the key connections among the topics described in detail in Part 4: Empirical Observations. Furthermore, it aims to establish the pattern of a cause–and–effect relationship among the critical topics.

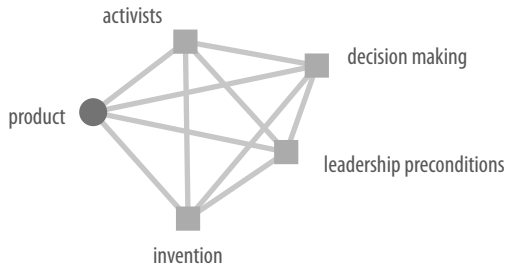

Figure 36. The Five Critical Areas of Attention in Leading Innovative Firms: An Illustration based on the Empirical Data.

5.3.1 Theoretical Linking of the Five Critical Areas of Attention

The five critical areas of attention (see Figure 36) represent the entry into the world of thinking of the leaders of innovation. These areas have the broadest and most well recognized associations across the topics of this inquiry. To further highlight the five areas of attention, connection to theory and thinking in these areas is made in this subsection. Connections are made to the same theories presented in Part 2: Theories. After the comparison with theories associated with the critical elements, the direct associations and connections with these five topics are addressed in this sub–section.

The *new product* in the typology of this study is defined as the output of the firm, which may be a material product or an immaterial product, services related to the product, new processes of making the product, new input to the product, or organizational or social innovations. The definition also includes the product concept, its features, and aspects of product engineering. This discussion about the product refers to the particular

knowledge of product innovation theory. The Schumpeterian (1942) typology of areas of innovation assumes various forms as the product, new materials, new methods of manufacturing, and new geographical markets. Grönroos (1998) suggests that we should see the product, not as an isolated object, but as part of a service process. This category of discussion also has references to the definition by Norman (2001), who introduces into the terminology types of such innovations as industrial products, customer–based products, and value–creating systems. (The latter has associations with the Business Model presented Part 2: Theories). Beyond this framework, the products are analyzed according to three levels of innovativeness, referring to my own definition: *new to the firm, new to the firm and market, and new to the world.*

The discussion about the *activists* engages a broad list of people and characters. However, drawing from organizational theory, there are not many participants in the firm who are ready to provide an extraordinary contribution working with the unknown. I argue this based on the claim that individuals are scared of failure and penalty, leading to limitations of the future career prospects and loss of authority. Hauschildt and Kirchmann (2001) outline the contribution and bases of power of those individuals who are able to overcome the resistance of not knowing, not wanting, and inability. In the various cases, observations of these characters vary from a single Power Promotor, to a dyad of a Power Promotor and a Promotor of Know–how, and a troika comprising a Power Promotor, a Promotor of Know–how, and a Process Promotor. One observation was that in the most obvious case of an innovative firm, the three characters are apparent, whereas in the case of a non–innovative firm, those roles were difficult to find. A case was also encountered in which the roles were present, even though the firm was not successful in innovation. This calls for the attention to other factors that can explain the failure of outcome.

The role of the activist can also be framed by applying Simon's (1945) administrative theory—in the part dealing with the theory of authority, for instance. The formal hierarchical authority has as a counterpart in the

informal hierarchical authority of know–how and ideas. The discussion about activists links finally to the theory of organizational equilibrium.

The category of *invention* is closely linked to the product, with the distinction that the discussion in particular attends the wake of ideas, the way of inventing, and the creations that will later be visible as an innovative product, either material or immaterial. This partly introduces Kirzner's theory that the existence of opportunity is explained in the different levels of access to existing information, and Schumpeter's theory claiming that new information can explain the existence of entrepreneurial opportunities (Shane 2003).

Evidence of the validity of both theories was found in the interview material: 'It is quite a brain exercise when you do it—the manufacturability, the idea of the product, and the crafting of the idea, financing and then a view of the market'. When it comes to a new idea, to quote further the technical executive who illustrates the Schumpeter view and an example of the other Kirznerian view: 'I have underway cycloid cogs, which I know from an hundred–year–old engineering handbook is better made in plastic. That was already common knowledge 120 years ago. We have learned to combine technology and materials'.

Another theoretical angle is to view inventing from Shane's (2000) frame of reference of prior knowledge, a model that focuses on knowledge that originates from the market, ways of serving the market, and customer problems. Drawing further on knowledge as an explanation for invention leads us to look further in the direction of Nonaka and Takeuchi's (1995) theory of organizational knowledge creation. This suggests a pattern of turning the implicit through discussions into the explicit, materializing explicit knowledge into solutions of new combinations, and gaining experience through doing things that again generate new information. The theory of knowledge creation has the same character of iteration as does the Van de Ven (1986) proposal of sequential coupling. The discussion about the flow of events produces a link to the model, in which R&D, marketing, and production resources work together in a way that brings

about innovations.

The discussion about the *decision–making* process connects to the theories of the input into decision making, processing in terms of choice, and the final end of the process: the decision. One option is to examine this discussion through the theory of the firm, or more specifically, to connect the discussion about decision making to the behavioral patterns in the formulation of goals (Cyert, March 1963) as a collective process. Cyert and March assume that individuals have different demands and drifting attention, and that they lack complete information about decision making. The theory argues that just as there is a specialization of task, and there is a specialization of securing information in an organization. This is an information–processing theory that relies on the assumption that all information exists and needs to be channelled through proper handling and routing to people who need the information to deal with a specific situation in the organization. This leads to the need for the concepts of a bargaining process and control systems. Alternatively, and comparable to Cyert and March's theory, the knowledge creation theory is also linked to the process that leads to decision making. The major difference is the iterative course of events, and a relaxation of the assumption that information exists in the first place.

Judging from the empirical material, the theory of knowledge creation, in combination with the theory of an organic management system, seems to be the a likely combination of theory to explain decision making under unstable conditions of innovation.

The final critical element, the *preconditions of leadership* of innovations, are defined in the established classification of the empirical material as *given conditions* and conditions related to the historic *legacy* of past times of the organization. This discussion refers primarily to the theory of company culture. The conditions further address the *establishment*—the group that holds the power at the top of the firm, which primarily refers to the theory of formal vs. informal organizations and the mechanistic vs. organic management systems. The interpretation of the ethos of the firm by the

establishment in terms of *self–perception* is connected to the theory of values. The interpretation of the *situation* of the firm, and from this the following synthesis in terms of the *strategy* or *business model* of the firm, connects to the theories of the environment and the situation, and the theory of strategy described in the Part 2: Theories. As noted previously, the interpretation of the situation mirrors the view upon which the establishment makes an interpretation of the role of the firm and the formulation of the strategy. However, in a mature organization, the strategy formulation does not begin as a blank sheet. The starting point is what yesterday gave today as a starting point. Hence, the theory of the culture of the firm begins to explain something about the propensity to innovate or the absence of that propensity.

The culture is defined as general customs and beliefs of a particular group of people at a particular time (Aaltio–Marjosola, 1991). As the culture is the sum of experiences and decisions, it is evident that management cannot decide what is in the collective memory of its organization. As was seen in the empirical overview, management can and does manipulate what is highlighted from the past. Also, through a new experience, a new culture is built. The theory of knowledge creation can also be connected here. However, in order to take effect in the entire organization, a good deal of time and effort is required. From this follows that the strategic orientation chosen by the firm summarizes all the time consuming interpretive work. Hence Mintzberg's (1978) theory of emergent or deliberative strategy formulation and Porter's (1985) theory of generic strategies of product, customer, or product excellence, all play a vital part in helping us to understand the priorization of the efforts made in an organization. The supports of the upper ranks may be explained by Simon's (1945) administrative theory. It addresses, on the one hand, the role of hierarchy delineating the power structures, and, on another hand, the role of individual identification with the organization and its goals.

Another favorable condition for leading innovation is proposed by Brown's (1976) the theory of values. Brown bundles the behavior and

opinions with underlying attitudes and general beliefes. When this aspect is brought to the table, it becomes evident that the organization, through its individual members, becomes part of a more open society than that of the mere firm. In summary, the discussion about the preconditions comprises a large field of theoretical references, which reflect how general this discussion is. The drawback is the difficulty of distinguishing those theories with predictive value under changing conditions. The elements presented in this discussion has many references to the framework proposed by Trice and Bayers (1991), who describe the linking of leadership to its consequences on an innovative vs. a sustaining company culture. Their hypothesis was mentioned earlier in the section Company Culture.

As has probably become evident, the number of frames of reference is interrelated, but they also highlight many aspects of the phenomenon studied. That is why parts of a theory are applicable in several instances in the stories in the section before the conclusion of this study of leadership in repetitively innovative mature consumer product firms.

5.3.2 Analysis of Associations Applying Actor Network Theory

The coded material provides easy access to the analysis of intersecting sections of the text in talks, or framed text sections, when two selected key words occur. When, for instance, the association between the activist and the invention is analyzed, several quotations are chosen from the intersecting texts of those categories. To quote one of the executives interviewed, '*Harry* works like an engineer; he *creates* new products for a particular need and context, and how we agree upon it'. The task is to find out, for instance, if actors influence the invention, or vice–versa. In this example, the *activist* [Harry] and the *creation* [act of invention] appear in direct connection to each other. In this relatively simple example, it appears fair to conclude that the actor influences over the *ways of inventing*.

The purpose of the dependency analysis is to trace a pattern of impact

between what was previously suggested to be the critical categories of discussions concerning leadership of innovation. That is why each intersection between each critical category is investigated thoroughly on the detailed level through the properties of each category. In total, 148 tests were conducted of each association between the two subjects of each category of discussion. The texts in the database also contain indirect connections among discussions. In order to reduce the data, however, the analysis has concentrated on the direct connections, and to provide greater focus, only those intersections of significant attention have been analyzed.

Each intersection was studied several times to search for quotations that would exemplify different directions of influence. As in the case of the connection between the *activist* and the *invention*, the impact was in only one direction. There may be a logical reason for a reverse impact in this intersection, of course. A distinct impact could not be established in a case such as the dependency between the *activist* and the *given conditions*. Evidence in a case like this was found for influence in both directions.

The quotations from the empirical database used in the analysis are presented in Appendix E. The results of the analysis of the dependencies are presented as a table, as in the study of the relationship between the *activist* and the *given conditions*. Table 57 offers a condensed presentation of how the results are presented in this excersise:

Actor vs. Conditions	Given	Self–perception
Activist	Act ← Giv	Act → Self

Table 57. Dependency Between Actor and Preconditions.

The directions of influence are marked by ← when the latter dominates the former, by → when the former dominates the latter, and by ←→ when two directions of influence have been detected in the study between two poles. The overall assessment of the influence between two categories is concluded

by counting the number of ←, →, and ←→. If more evidence has been found in a two–way dependency, then the dominant end has been marked with **bold.**

5.4 Analysis of Associations and Dependencies

The intention with this section is to expose systematically the connections of the significant areas of attention in the discussion about leading innovations. The substance of the topics has been referred to earlier in Part 4: Empirical Observations. This presentation will highlight the linkage between the two poles from several aspects, in order to describe the diverse connections between every critical category of discussion.

The matrix shown in Table 58 is a summary of the matrix presented in the Figures 31 and 32. The relationship is described and tested though the properties of each of the categories. Altogether ten dimensions of the six critical concerns of the leaders were analyzed. The test described was repeated 148 times, until new iterations did not seem to result in any new information.

	Actor	Ideas	Dialogue	Condition	Product
Actors	X	A – I	A – D	A – C	A – P
Ideas	I – A	X	I – D	I – C	I – P
Dialogue	D – A	D – I	X	D – C	D – P
Conditions	C – A	C – I	C – D	X	C – P
Product	P – A	P – I	P – D	P – C	X

Table 58. Critical Dependency Analysis Matrix.

The task was to determine the relationship between, for instance, the activist and the conditions, according to those who were interviewed: Do the conditions rule over the actors or do the actors rule over the

conditions? Testing was done on the property level of each category, and thereby established the dependency among the categories.

The entire exercise of testing the dependencies is not fully described here. If each of the dependencies among the critical categories were referred to separately, the text would cover a detailed description of 84 associations, plus 18 additional descriptions in which the dependency goes in both directions. It would be daunting reading. Therefore, only the dependency analysis between the significantly recognized properties of the activist and the conditions are fully explained, for illustrative purposes; the other dependencies are superficially addressed. The record of the test extracts used for the analysis of the dependencies and the merit for the judgment of the dependencies are presented in the Appendix E. Beyond those text extracts, numerous queries from the materials have been made, in order to determine if the reliability of the judgment is well founded.

The outcome of the intersection analysis is presented as the *activist stream* of associations, the *product stream*, the *condition stream,* and the *idea stream*. The description could have been presented in other ways (Table 57) : columns vertically or lines horizontally, for instance. In any case, the description of each association between each category and properties would be the same.

5.4.1 Activist–Related Associations

The stream of discussion about activists is closely and firmly associated with discussions about the preconditions of leadership, the idea, the decision making, and various aspects of the product. The empirical material comprises a large number of activists. The activists may be characterized as ranging from project managers, through senior managers and CEOs, to board–level actors. Another dimension of the same activists are such informal role characteristics as that of investor, idea person, opinion leader, lobbyist, liberal bloke, and savior.

5.4.1.1 Activist and Conditions

When the activists talk about the conditions of innovation, attention is drawn to the given conditions, like the Arctic location of the firm; the conditions of the *establishment,* like the influence of the upper hierarchy of the firm; the company *strategy;* and the conditions coming from the *self–perception* of the firm. The association is fundamental. In some respects, a dependency between the activist and the conditions appears to be a constraint; in some respects, it seems to be essential for innovation.

One could assume that the *given condition* and the *establishment* rules over the organization. However, when looking closer at this axis, it demonstrates that the activist of innovation may be an exception. To quote a managing director: 'The mentality of the head office staff in the US with their quarterly reports does influence us. They are so shortsighted. If we have not reached our targets, there must be explanations. However, the invention track record of Oscar Wood gives us some protection'. Exceptional activists are able to turn the hierarchy around, for good reason. In this example, the past merits are a factor in challenging the conditions. The example also demonstrates how distance may introduce the cultural elements of the company—limitations that are difficult to change. The rules of stock–listed companies are strongly influenced to comply with *market regulations* from which an individual firm cannot divert.

The firm's *self–perception* is in the minds of the people in the firm. It is no absolute picture, but a perception of what the firm should be engaged in. It appears to be under ongoing reformulation by activists in search of direction. As the managing director of Humanist said, '*The owner* said to me, *as the CEO*, just do it! This kind of building project is *what Humanist has been about*, and *should be about* again in the future: *supplier of complete solutions for living*. Not a mere furniture company'. It is evident that the mind of the each individual cannot be ruled, but that those in the higher ranks may have an interpretation that becomes (or does not become) a

higher code of belief of the organization's orientation into the future.

Like the self–perception of the organization, the *strategy* is chiefly in the hands of the management. To quote a division director, 'This is such a *strategic product* project that it was never questioned. It was blessed, even on *the highest level, by the president of the firm*'. This follows from to the fact that some of the activists have higher authority in the organization. Expert activists do not necessarily belong to upper management, but may still be part of the strategizing. As a technical director at Adventurer told me, 'You can hire professional designers instead of growing that competence in–house. Professionals like *GF* developed his competence and excelled in his own niche. We combined this with a boat–building tradition and have found this design *strategy* to be right for us'. It seems, then, that a well placed and skilled actor who is not a member of the management team can equally well play a part in the drama of innovation.

The analysis concerning the activist and the conditions suggests, as shown in Table 59, that the activists appear to be both influencing and influenced by the conditions:

Activist vs. Conditions	Given	Self–perception	Establishment	Strategy
Activist	Act ← Giv	Act → Sel	Act ←→ Est	Act ←→ Str
N = 1 →, 2 ←→, 1 ←				

Table 59. Test of Causality Between Activist and Preconditions.

The analysis postulates, more specifically, that activists regard themselves as subordinated to the given conditions. Yet there is evidence to suggest that those given conditions can be removed under extreme situations. Furthermore, the analysis indicates that certain activists have a tendency to influence the self–perception of the firm; they have a fraction more influence to dominate over the conditions through the interpretation of the conditions in the context of innovation (see Table 60).

Activist vs. Conditions	Conditions
Activist	Act ←→ Con

Table 60. Conclusion: Dependency Between Activist and Preconditions.

5.4.1.2 Activist and Invention

The significant discussions about the invention cover discussions about the idea, the ways of creation, and the creations along the course of events leading to new inventions. At first glance, the idea comes from somebody who causes the activity around the idea. To quote a managing director, 'Harry works like an engineer; he *creates* new products for a particular need and context, and how we agree upon it'. The idea is dependent, then, on the activist who has the idea. Once the idea has been circulated among associated people, then, the dependency turns around. As Plumber's managing director said, 'Those *salesmen* who were capable of selling the innovative faucet were by and large dependent on who found the interest and *embraced the idea* of the product'. There is a split between those who carry out the ideas and those who master the art of inventing. Furthermore, there are roles among the activists. As one yet another managing director said, 'The role of *management and the owners* in a company like this should be to support the belief during challenging times of a courageous *new idea'.* The statement focuses not only on the different roles of those engaged, but also on the generation of inventions.

The activist engaged in the search for ideas appear to rely simultaneously on a range of different *means* for bringing inventions forward. One hears about combinations, substitutions, adoptions, and copying. It is worth recognizing the iterative nature of responsibility along the course of events. To quote a chief designer, 'I was *extempore* exploring grinding techniques for our axes. I became conscious of a new technique, which would substitute the present and would to the job better. I was surprised

when my boss came later and told me he had bought the machinery needed. I was proud, as I was only 24 at the time. But instantly it hit me: It is now my responsibility to make it work'! As this example shows, early ideas can only become something when there are people with the passion, courage, and willingness to take it all the way until it works.

The idea recognition and modeling of the idea led the actors to deliver creations on various stages: 'Oscar Wood had made some *prototypes* of his idea and *I* traveled around and sold the idea. When we had our backs up and had had enough of orders, it was easy to make the decision to invest'. Although the creations are not yet in the final stage of a complete product, one can ideally trigger sales with the creation and put the project into action. Table 61 shows the results of the analysis of this association.

Activist vs. Invention	Idea	Evolution	Creations
Activist	Act ←→Id	Act → Ev	Act → Crea
N = 2 →, 1 ←→, 0 ←			

Table 61. Test of Causality Between Activist and Invention.

The conclusion is that dependency is mutual, and that it works in both directions between the actors and the making of ideas (see Table 62). Yet it should be stated that there are certain activists in the innovation context who produce ideas.

Activist vs. Invention	Invention
Activist	Act ←→ Inv

Table 62. Conclusion: Dependency Between Activist and Invention.

5.4.1.3 Activist and Decision Making

The course of events from the impulse *triggering* the *dialogue* to *decision* is paved by *conversation* and *emotions*. By no means does the process go in one direction. Rather, it is an iterative course of events.

In dialogue we influence and are being influence by the others. As a technical executive said, 'In the beginning, *management* was *confused* about speaking with and understanding the *electrical experts* who were new to our house'. The experts had a confusing impact on management, which caused uneasy emotions when speaking to each other. The example also demonstrates how their emotional beliefs influence people. The beliefs of the activists are again influenced by the impulses that cause reaction. As a Humanist Company executive said, 'The timing for the launch of Humanist's *initiatives* is imminent. *I* have never *felt* this *confident* about the success of our company'. This shows how impulse, here an initiative, affects people such that they come into an emotional state of conviction. During the recognition phase, the actor is influenced by impulses. During the conversation, the influence goes both ways, although the activist of innovations probably tends to influence the course of the conversation. Throughout the conversation, the persons were influenced by the emotions under which the activists make decisions.

Overall, the empirical material shows that the activist has influence over the dialogue, and through it, has influence on the decision–making process—but under the influence of emotions and other people. The dependency goes in both directions; yet the impact of the actor on the dialogue appears to be slightly stronger (Table 63) .

Activist vs. Decision	Impulse	Emotion	Conversation	Decision
Activist	Act ←→ Imp	Act ←→ Em	Act ←→? Con	Act → Dec
N = 1 →, 3 ←→, 0 ←				

Table 63. Test of Causality Between Activist and Decision Making.

The conclusion appears to be that the activists do not dominate the discussion, but influence it as one among equals. The indistinct influence between the activist and the impulse, emotions and discussion appears as evidence for this interpretation (Table 64). Yet, when the overall assessment considers the seeking for ideas and contact seeking, I argue that the activist exerts a more dominant force. It follows that the activist is influencing the interaction more than being influenced by it.

Activist vs. Decision Making	Decision
Activist	Act ←→ Dec

Table 64. Conclusion: Dependency Between Activist and Decision Making.

5.4.1.4 Activist and Products

The strong connection between the activist and the product is not surprising, considering the topic of this study. As the activists include all activists related to the innovation, it does not mean that all the individuals in the analysis are activists of innovation. Actors like human resource, maintenance, and facility staff, for instance, are remotely associated with innovation, yet still connected to it.

The different persons studied are closely involved in the drama of invention. In one case, a well networked agent plays a role, which includes a particular know–how influencing the conceptualization of the product.

To quote Adventurer's technical director, 'The US agent has been very involved in how the Exodus 42 Club *one design yacht* should be built'. Another commercial character has valuable insights about practical aspects that shape the product. As another executive said, '*He* contributes and regards the product from a design perspective, with emphasis on safety and *functionality* of the *product'*. In particular, when extraordinary know–how is needed among the activists, the organizational border between the internal and external is crossed. As Player's project manger said, 'When components of *playground gear for the disabled* were developed, we engaged a *specialist from the university* on the project team'. Table 65 demonstrates the result of the analysis.

Activist vs. Product	Concept	Engineering
Activist	Act → Con	Act → Eng
N = 2 →, 0 ←→, 0 ←		

Table 65. Test of Causality Between Activist and Product.

The results shown in Table 65 results convey a one–way perception of the activist influencing the product. The various characters were discussed in Part 4: Empirical Observations, describing the empirical findings related to the activists. It would be likely that that influence may occur in the reverse direction. It should be possible to discover activist becoming emotionally attached to their inventions, for instance, but no such statement was explicitly made in any of the interviews. It seems safe to conclude, therefore, that at minimum, the shaping of a novel product is highly dependent on those activists involved in the play (see Table 66).

Activist vs. Invention	Invention
Activist	Act → Inv

Table 66. Conclusion: Dependency Between Activist and Invention.

5.4.1.5 Conclusion of the Critical Activist–Related Associations

The analysis of the associations among the activist and the conditions, invention, decision making, and products points to the centrality of the activists, but simultaneously defeats a common misconception that they alone dominate their environment. Rather, their roles are reflective and their strength of character is a force that makes them powerful. It is also recognizable that the role of activists is associated with only a small number of actors, doing the majority of the work promoting innovation.

Activist vs. Critical	Conditions	Ideas	Decision	Products
Activist	Act ←→ Con	Act ←→ Ide	Act ←→ Dec	Act → Str
N = 1 →, 3 ←→, 0 ←				

Table 67. Summary of Activist–Related Association.

An interpretation of the Table 67 of results of the actor–associated stream is that either the activists themselves have, or they are associated with actors who have ideas. They initiate interaction, debate, and processing that leads to a conclusion that is legitimate enough that the cycle of innovation is put into motion. In parallel, the precondition of success is always present: situational analyses and debates about the fit between the idea and the ethos of the firm and the organization of the firm as a whole. Most likely, the inherent elements like collective memory, history, and company culture are reflected upon when positioning the idea and the future product.

5.4.2 Product–Related Associations

The product stream of discussion is significantly associated with the four dimensions of dependencies. In this situation, the product was discussed in association with *invention*, *decision making,* and the *conditions* of leadership. The product in this context is seen through its *conceptual design*, its *features,* and its *engineering* properties, which occur significantly in the discussions associated with the topics in this section. The concept may be a one–design yacht, for instance, with the feature of a flush deck and a carbon mast as engineering properties of the product. The services refer to this discussion, but the attention on the role of services was low.

> Apart from the analysis up to this point, the full magnitude of associations among all the critical elements are not fully described in this text. Appendix E provides a deeper insight into the full set of dependencies analyzed.

5.4.2.1 Product and Invention

The invention is a category of discussion constituting of idea recognition, which I have labeled *wake of idea*s—the *ways of working* with invention—taking the idea forward, resulting in various *creations,* which gives the idea shape and materializes it. The question of where the ideas originated is probably one of the most fundamental questions in innovation. One school of thought says they are ideas are discovered; another says that they are created. A to–the–point discussion can be found in one of the cases. As one technical leader said, 'In case of a known product and technology, the impulse, in principle, comes from the customers. In case of a totally new product, the idea and intuition begins primarily inside the company'. This may imply that the direction in which one places one's faith depends on the product concept. Both may pave the way to sources of ideas.

Product vs. Invention	Wake	Requirements	Evolution	Creations
Concept	**Con** ←→W	Con ← Req	Con ←→ **Ev**	Con ←Cr
Features	**Fe** → W	Fe ← Req	Fe ← **Ev**	Fe ← Cr
Engineering	Eng ←→W	Eng ←→ Req	Eng ← **Ev**	Eng →Cr
N = 2 →, 4 ←→, 6 ←				

Table 68. Test of Causality Between Product and Invention.

No distinct patterns are to be found in the results of the analysis presented in Table 68. One conclusion could be that the that the existing products are less dominant as the starting point for new ideas, compared to ideas coming from 'free thinking', without the existing product being the point of departure (see Table 69).

Product vs. Invention	Invention
Product	Prod ←→ **Inv**

Table 69. Conclusion: Dependency Between Product and Invention.

5.4.2.2 Product and Decision Making

The product is discussed in connection with the *wake* of an idea to be recognized, accompanied by the *conversations* about materializing the idea, the *emotions* attaching or detaching the product to those involved, and those decisions made because of the process. Although the order of the decision–making phases may seem straightforward, the process is highly iterative. As Humanist's managing director, 'I *said, "ok*, let's try". We had *white painted furniture* that we *presented*, so that the different *items* would not look like a salad of herrings. *I regret* the decision to accept that. The *critic* of the *product* was not particularly good'. Conversations may be a result of a

concept or the concept may be a result of conversations.

Product vs. Decision Making	Trigger	Emotions	Conversation	Decision
Concept	Con → Tr	Con → Em	Con ←→ **Co**	Co n ←→ **Dec**
Features	Fea → Tr	Fea → Em	Fea → Co	Fea → Dec
Engineering	Eng ← Tr	Eng → Em	Eng → Co	Eng → De
N = 6 → 3 ←→ 2 ←				

Table 70. Test of Causality Between Product and Decision Making.

The results in Table 70 indicate that the product is primarily the cause of interaction, yet not across the board. In terms of what triggers the dialogue, the emotion, and the conversation, all these elements shape the product. It appears, however, that particularly in the case of decision making, the product invites decision making, but the decision making equally influences shaping of the product (see Table 71). The analysis of the observed directions of influence primarily suggests that decisions are made because of matters introduced in terms of the product, rather than the decision–making routine dictating the product. It may be that one's own judgment is used more than outright decision making.

Product vs. Decision Making	Decision
Product	**Prod** ←→ Dec

Table 71. Conclusion: Dependency Between Product and Decision Making.

5.4.2.3 Product and Precondition

When the product is associated with preconditions fundamental to the firm, the product is spoken of in connection with *given conditions* such as the geographical location of the firm—the view of *self–perception* articulating, for instance, the difference between a 'living space firm' or a 'furniture firm', and finally the various top–level *strategies* of the firm.

There is a division between those preconditions affecting the product that are imposed by the current establishment and those that are the decision of no one in the establishment. Decisions made by no one present may be a historic localization decision—collective memories of the products from the past. A similar given condition may originate from the industry norms in which the firm operates. To quote Adventurer's technical director, 'The yachting industry has volumes so small that we are lacking the time for proper planning of *materials*—how *to build efficiently*'. This example illustrates the specific dependence between the industry where it operates and the engineering of the product. The preconditions may be also imposed by the current regime that influences where the product development is taken. As in one of the cases in which the operational excellence strategy appears to have been the prevailing doctrine, it may be fair to assume that conditions for product innovations are poor and have a relatively low priority.

Product vs. Conditions	Given	Establishment	Self–perception	Situation	Strategy
Concept	Con ← G	Con ← Est	Con ← Sel	Con → Sit	Con ← Str
Engineering	Fe ← G	Eng ← Est	Fe ← Sel	Eng ← Sit	Fe ← Str
N = 1 →, 0 ←→, 9 ←					

Table 72. Test of Causality Between Product and Preconditions.

There is consistent evidence that the preconditions of the firm rule over the product design in most situations, as seen in Tables 72 and 73. The finding could be seen as common sense.

Product vs. Conditions	Conditions
Product	Prod ← Con

Table 73. Conclusion: Dependency Between Product and Preconditions.

5.4.2.4 Conclusion of the Critical Product–Related Associations

All the categories of discussion about the invention, the dialogue, and the condition appear to influence the shaping of the product. The product design in particular clearly adapts to the preconditions of the firm. The discussions associating the product with the invention and the dialogue do not exert an equal impact on the conditions. There are contradicting directions of influence, yet at such a low level that at the end of the day it is fair to conclude that the main influence goes from the discussion about the *invention* and the *decision making* shaping the product design (Table 74).

Product vs. All	Invention	Decision	Conditions
Products	Prod ←→ **Inv**	**Prod** ←→ Dec	Prod ← Con
N = 0 →, 0 ←→, 3 ←			

Table 74. Summary of Product–Related Associations.

5.4.3 Condition–Related Associations

The condition–related stream of discussion in this section refers to conditions under which invention and the related dialogue and decision making occurs. The preconditions are described as *given* and *inherent* conditions, as well as conditions related to the *self–perception* of the *establishment* of the firm, the understanding of the *situation,* and the *company strategy* associated with it.

5.4.3.1 Conditions and Invention

The invention is described as the emergence of an idea, the requirements popping up when the idea becomes explicitly known, and the evolutionary means crafting the idea into creations at various stages. The association introduced in the interviews intersects with a broad range of aspects of the conditions: given, establishment, self–perception, situation, and strategy. This association and dependency relationship is complex. Following is a brief highlight of 3 of the 20 intersections.

The *wake of ideas* appears to be dependent upon the conditions. The association between the conditions in terms of the situation and the idea in terms of the *wake of ideas* looks, for instance, like a quote of one of the technical leaders: 'The situation today when new people have joined the company is that it puts pressure on us older ones. But I see it as remarkably positive. New people bring in new ideas and question

arrangements that we older ones do not reflect upon. We are blind'. The situation in the firm was brought about by new people entering the play and stimulating creativity. An exception to the pattern occurred in a case in which the emerging ideas influenced the self–perception of the firm, To quote a sales manager: 'Today Humanist is a supplier of furniture. And a Domestically–oriented one. We have to figure out how Humanist could be abroad internationally, to make a synthesis, and then to bring forward new product ideas. We won't make it with this product range'. The example shows how the synthesis—an ethos other than the current one of being a furniture company—will bring along new product ideas, which enables the firm to go international.

Conditions vs. Invention	Wake	Requirement	Evolution	Creations
Given	W ← **G**	Req ← G	Ev ← **G**	Cr ← **G**
Establishment	W ← **E**	Req ←→ E	Ev ← **E**	Cr ← **E**
Self–perception	**W** → Sel	**Req** ← **Sel**	**Ev** → Sel	Cr ← **Sel**
Situation	W← **Sit**	Req ← Sit	Ev ← **Sit**	Cr ←→ **Sit**
Strategy	W← **Str**	Req ← Str	Ev ←→ **Str**	Cr ←→ **Str**
N= 2 →, 4 ←→, 12 ←				

Table 75. Test of Causality Between Preconditions and Invention.

The results in Table 75 indicate a pattern that conditions dominate the wake of ideas when opportunities are recognized. The same applies for conditions having consequences for the requirements, the evolution, and hence the creations when inventions are made. A contradiction in the table is the relationship between the self–perception of the firm, which indicates that the self–perception is a condition for invention, and, in some cases, a reflection of what has been recognized, and how the development is made.

The *overall assessment* is that the conditions dominate the ideas, rather than the ideas being the conditional factors in the organization. It is

probably safe to draw the conclusion that the invention is generally said to adapt to the conditions, but sometimes a change of conditions may lead to innovations (Table 76).

Conditions vs. Invention	Invention
Conditions	Con ←→ Inv

Table 76. Conclusion: Dependency Between Preconditions and Invention.

5.4.3.2 Conditions and Decision Making

The study of the association between conditions and decision making, and in particular, the factors that *trigger* the dialogue, the *emotions,* and the *conversations* that lead to a *decision* are significantly recognized when examining this association. The properties of the conditions in this association are observed in terms of the *given* conditions, the conditions of the prevailing *self–perception* of the company, and the doctrine in terms of the *strategy* of the firm.

The evidence of the association between what is perceived as given conditions and the decision making clearly indicates that the given conditions dominate over all phases of the decision making, confirming that the actors really perceive the given conditions to be beyond their influence. To quote a managing director, 'We aspire to product leadership, and considering our *geographical location*, it was a logical *conclusion* that we would focus on R&D to boost knowledge intensively in our products'. The example is a strong indication that what is perceived as given—in this case the geographical location—rules over the conclusion of the dialogue.

Contrary to the perception of the given conditions, the self–perception is much more debatable in the discussions. The empirical evidence

does not provide a distinct picture of the dependency; sometimes self–perception rules over the decision–making process or decision making aspires to shape the ethos of the firm. In one such case, one of the key actors stated. 'We are an innovative user of wood", and another interviewee in the same organization said, 'We have had this raw–material–based discussion: "Do we stick to wood or do we introduce metal and plastic in our products?" It has been very emotional. In a way, you understand it; it is a hot issue because the location of the firm is based on the idea of wood'. The example shows how a personal conclusion of one actor programs criteria for the kind of decisions that are accepted. As in this case, new materials were not in favor, because the identity of the firm assumes the use of wood.

Conditions vs. Decision Making	Trigger	Emotions	Conversation	Decision
Given	**G** → Tr	**G** → Em	**G** → Con	**G** → De
Self–perception	S ←→ Tr	S ← Em	S ←→ Con	S ←→ D
Strategy	**Str** → Tr	**Str** ←→ Em	**Str** ←→ Con	Str ←→ **Dec**
N = 5 →, 6 ←→, 1 ←				

Table 77. Test of Causality Between Preconditions and Decision Making.

Table 77 indicates what is communicated by the leaders about the given conditions consistently exerting influence in all phases of the decision–making process. Another suggestion from the material is that, with reservations for deviations, that strategy emerges as a consequence of the decisions made, but the strategy also triggers and leads to emotional discussions. Apart from these patterns, the evidence of the other associations is inconsistent. The *overall assessment* of the association between the conditions and the decision making is that a distinct causality cannot be established (see Table 78). If any distinction is to be made, a conclusion may be that in general, but not always, decision making adapts to the pre-

conditions of leadership.

Conditions vs. Decision Making	Decision
Conditions	**Con** ←→ Dec

Table 78. Conclusion: Dependency Between Preconditions and Decision Making.

5.4.4 Decision Making and Invention

Finally, the decision–making stream brings into consideration the association between decision making and invention. This is the remaining association between the critical elements that have yet to be addressed in this section—an association that is as strong as all the associations previously addressed. The strength of association is also seen as the broad range of connections between the two categories of discussion. The cornerstone of the associations between the invention and the dialogue is the connection between the *wake of ideas* and the *triggers of interaction*. As defined in this work, the wake of an idea is the label for conceptions of the birth of ideas, like awareness of a technological leap to come or ideas from an engineering handbook. Likewise, the trigger for interaction is an interpretation of somebody's ambition, an initiative, a question, or something that sets the communication process in motion. As shown previously, the invention is discussed in terms of *requirements,* once an idea has been introduced; the *ways of creating* something new; and, consequently, what follows of that work: *creations* making up an innovation. The decision making meets these considerations in terms of *emotions* in the *conversations* that eventually lead to a particular *decision*.

Compared to the clear influence of new ideas triggering the dialogue, the direction of force in the connection between the *ways of inventing*

and the decision making are not equally apparent. Emotions often rule the ways in which the firm will develop, and sometimes chosen ways of developing cause emotions. More often, the decisions rule the evolutionary measures; yet, sometimes the decisions follow because of the chosen evolutionary method. As a chief designer said, 'We have a good many product features, and we have learned to combine technology and materials. We try always to keep three aspects present in a new product: preferably improved functionality; possibly new technology and new materials that make cost sense; and, finally, design that supports all this'. This statement demonstrates a way of inventing, requirements, and how the criteria of creations are the basis for the decision making concerning new products.

Decision Making vs. Invention	Wake	Requirements	Evolution	Creations
Trigger	**W** → T	Tr ← Req	Ev ←→ **T**	C ← **T**
Emotions	***W*** → Em	Em ←→ Req	Ev ←→ **Em**	C ←→ **Em**
Conversation	***W*** → Con	Con ←→ Req	Ev ← ***Con***	C ← ***Con***
Decision	***W*** → De	De ← Req	Ev ←→ **De**	***C*** ←→ De
N = 4 →, 7 ←→, 4 ←				

Table 79. Test of Causality Between Invention and Decision Making.

The results shown in Table 79 indicate that apart from the initiating influence of idea recognition on the decision–making process, there is no particular pattern of direction of influence across the other intersections of decision making and invention. No general, coherent pattern of impact has been found (see Table 80).

Decision Making vs. Invention	Invention
Decision	Dec ←→ Inv

Table 80. Conclusion: Dependency Between Preconditions and Decision Making.

5.4.5 Summary of the Analysis of the Critical Associations

The conclusion of the analysis of dependencies between the critical elements is summarized in Figure 37. The analysis exposes the centrality of the activists. The activists are not only central due to their force in innovation cases, but also serve as sounding boards in dialogue. They act as catalysts and as stimulators.

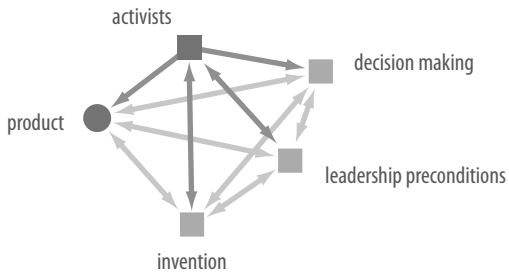

Figure 37. Five Critical Elements Dependency Analysis Result.

The picture also demonstrates the associations that keep shaping the product—the ultimate focus of this research. Beyond the activists mentioned previously, ideas are the other strong force that sustains the state and cycle of innovativeness in combination with the interaction

between the activists and concluding at an interpretation of the preconditions that set the stage for the drama of innovation. In other words, the results also suggest the prime factors that influence the shaping of a product as a function of the inventive idea of somebody, interpretation and conclusion of prevailing conditions, and the quality of the dialogue and decision making.

5.4.6 Landscape and Levels of Attention

The Figure 31, Landscape of Attention, can also be analyzed from a topographical perspective. The previous analysis was an in–depth examination of what has been here labeled as the critical areas of attention and discussion. Data for the critical areas of attention were brought from the empirical material using the General Level Matrix (see Figure 33) with limiting criteria. If those criteria are relaxed gradually, three new layers of attention in the empirical material emerge correspondingly. For that purpose, Figure 32 of the detailed–level matrix serves as the basis for interpretation. The various levels of attention were introduced with four sets of limiting criteria:

Level 1. Critical—categories significantly discussed and interrelated

Level 2. Central—categories significantly discussed, but not significantly interrelated

Level 3. Peripheral—particular properties significantly discussed and interrelated

Level 4. Loose—the rest, none of the above.

5.4.6.1 The Central Dependencies

If consideration is extended from critical matters to central matters, issues dealt with previously are complemented with four additional dependencies. The attention spreads particularly into the system–driven matters of sales/marketing, projects management, departmental set–up of the firm, and economical concerns.

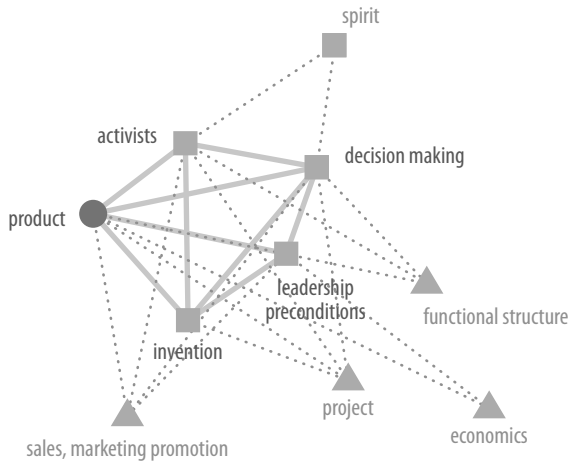

Figure 38. Central Dependencies.

The Figure 38 illustrates more strongly concerns about how to sell the invention, how to deal with it as a project as a part of the organizational structure, primarily manufacturing, the R&D department, and the marketing/sales department. In the minds of the actors, the economic and the spiritual aspects appear to have equally many links to the critical factors, yet less than the former topics.

It is somewhat surprising, that the *external rulers* do not represent a prominent domain of attention. An interpretation in the light of these research findings is that the activists tend to see the world primarily

through and with the product in their mind. It is worth recalling that the product here comprehends both the tangible and the intangible features of the product, like services. The product appears to be seen as the link between the internal and the external domain.

5.4.6.2 Peripheral Dependencies

When the scope of attention is brought to the following, more comprehensive, peripheral associations of the discussion become visible. The *external rulers* are the appearance of the product, the customers of the product, the location of use of the product, and the associated patterns that emerge when the consideration is expanded to include peripheral concerns. Skills and practices also expand the view of reflective and individual motivation–driven matters associated with innovativeness. The findings are illustrated in Figure 39.

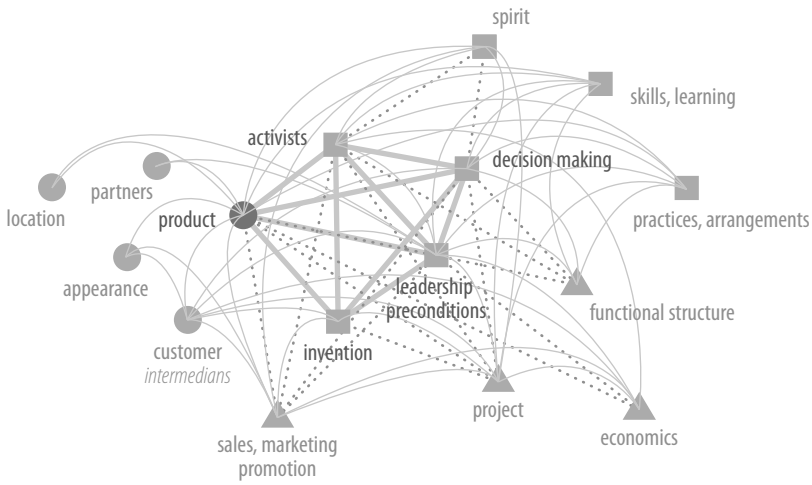

Figure 39. Peripheral Dependencies.

A remarkable observation is that the external contingencies appear only this late as vital areas of discussion and attention.

5.4.6.3 Loose Dependencies

The final and broadest, yet more shallow level of attention, pictures the loose dependencies associated with the critical categories of discussion about innovation. At this level, external rulers like the user, the usage, science and society, opinion leaders, and the internal aspects of processes emerge in the discussion. Figure 40 illustrates the broadening scope of attention.

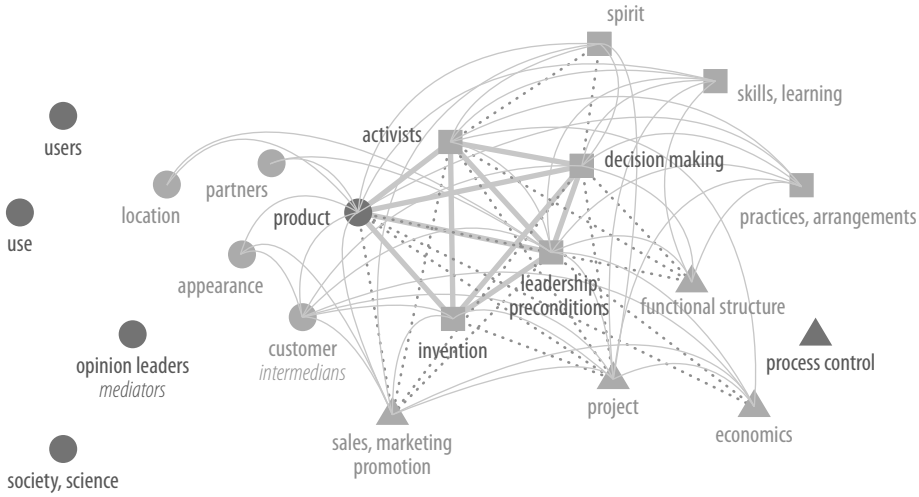

Figure 40. Loose Dependencies.

Contrary to prior expectations, the users and the use appear to play a relatively minor role in the minds of the activists of this study. Or, at least in this case, it can be stated that innovation does not appear to be user–centric or user–driven. One could assume that there would be a strong connection between the use, the user, and the location of use, if experimenting with combining these categories and hence increasing their role. When one examines the intersections of the three categories, however, one finds scarcely any significant associations. The conclusion

remains, therefore, that the innovations of the cases are not particularly user–driven among the firms examined. The low level of recognition of the process aspect of innovation is another contradiction that comes out of this research. The process could be a more suitable concept to apply in the more mature end of product development or in a stage at which existing solutions are subject to modification.

5.4.6.4 Levels of Strength and Dynamics of Attention

At this point it is helpful to recognize the balance of the general areas of discussion. When studying the critical elements, four out of five things are classified as individual motivation–driven and one as an external ruler. It is worth recognizing that the system–driven aspects appear are a secondary concern of the activists (see Figure 41).

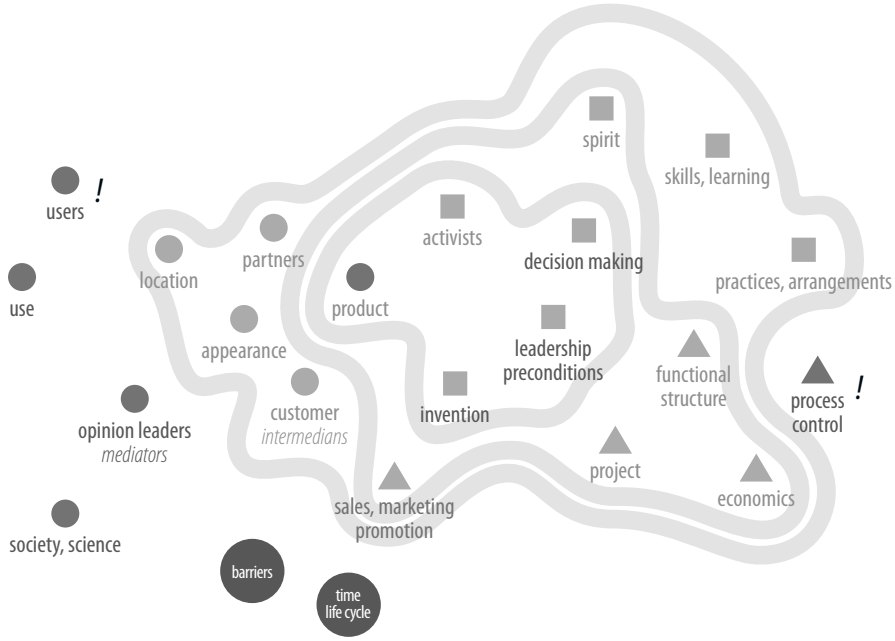

Figure 41. Levels of Attention.

When attention expands to include the third level, the discussion starts to emphasize many of the external rulers: location, appearance of the innovation, customers, and partners, along with attention to skills and practices. A reason for skills and practices appearing to be of peripheral status may be described by the fact that the sample consists of mature firms, and that most of them have a recent track record of innovation.

When observing the way attentions expands in Figure 41, from the critical elements to the rest of the elements, it leads to the suggestion that that attention begins with emphasizing the internal and individual motivation–driven aspects, followed by internal system driven consideration, leading the attention to external rulers. I propose that this pattern of attention emerges in connection to the amount of time the leaders devote to innovation leadership

The results of the analysis lead me to suggest another pattern in connection to the time aspect: the longitudinal view of the whole cycle of innovation. Everything said in this book probably comes down to timing. The life cycle phases extend attention to the innovation beyond the project life, to the sequence commonly associated with the project and innovations. The life cycle discussions, recorded in this study, have minor phasing like *Dawning* when all gets started, the *Pioneering* when the undertaking has very loose forms, the *Product development* when a project becomes effective, followed by *Product Completion* when the development projects are generally closed, and *Product Delivery* when production starts to deliver. The subsequent milestones are *Sales take–off* when sales volumes become significant, followed by the *Rationalization* phase when economies of scale can be achieved through new measures of development. The final phase is labelled the *Sunset phase*, which appears to be both an end and a new beginning: the dawning again.

The front end of the course of action dominates the innovation discussion with the leaders, judging by the volume of talks (see Figure 42). There appears to be no large fluctuations in the balance of acknowledging the critical elements throughout the life cycle. For instance the product

remains as central as the actors in each phase of the innovation cycle.

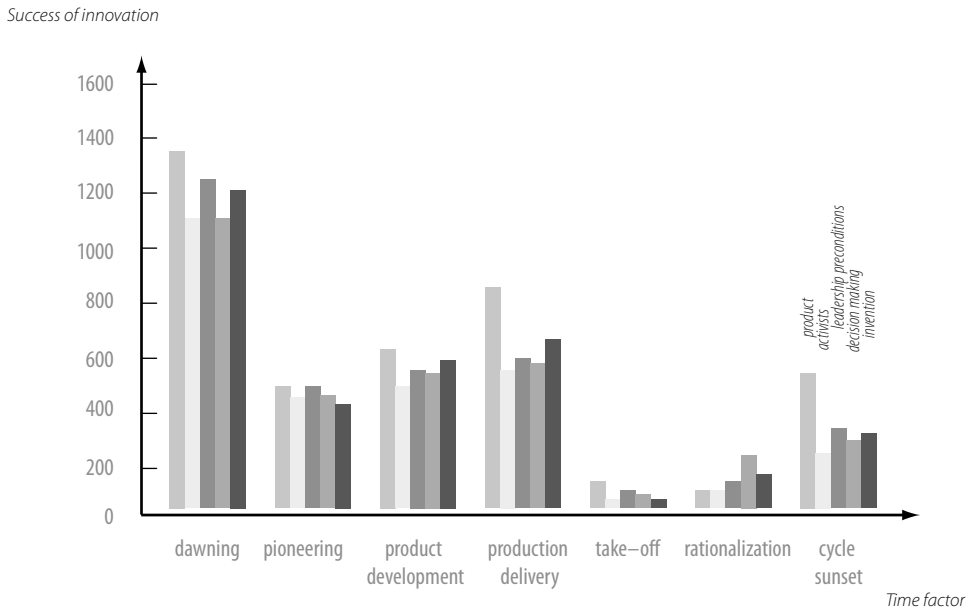

Figure 42. Dynamics of the Critical Areas of Attention along the Life Cycle of Innovation.

There is a difficulty in properly locating the innovation on the time axis. When we talk about innovation, when does it get the status being an innovation? Was it at the dawning when some wake of a conception was created in somebody's mind? Or was it when production delivered it, but the product innovation had not yet earned even a cent? Or was it when the sales took off? Or did it all start at the dawning? Did the early conception originate in the rationalization phase or at the sunset phase when the old product became obsolete? As the analysis of the critical, and to some extent the other central elements indicate, the critical elements and associations remain the same throughout the cycle. Only the intensity of attention over time changes.

Summary of the Analysis

The analysis was conducted in order to find those topics of greater concern, from the landscape of all concerns addressed. Another purpose was to establish the prime dependencies of those greater concerns of leadership. The result of the analysis proposed not only those two aims, but also demonstrated the centrality of those greater concerns. One result of this study suggests that the prime concerns of the leaders are the dependencies among the preconditions of leadership, the activists, the decision making, the inventing, and the product. These topics were found to be the most interrelated, and to have the widest associations across the empirical material. In other words, talking about these five matters is most likely to lead to all the other areas of attention in the landscape. The analysis further sets forth the centrality of the activists, the persons who are the drivers of the development. Another interpretation of the analysis is that the product is primarily a reflection of the persons involved, the discussions around invention, and the interpretation of the prevailing conditions in the firm. The analysis also results in a suggestion that there are four levels of qualities of attention. The more time spent with the activist, the greater becomes the scope of their attention, and perhaps also know–how.

One result of the analysis is the suggestion that on general level attention starts from individual motivation–driven matters, then expands into system–driven factors, and finally addresses the external rulers. A further proposal is that the critical elements remain equally balanced, yet the intensity varies along the cycle of innovation. A surprising finding in the analysis of the areas of higher attention was the discovery that innovation leadership did not stress the process aspect (rather, the opposite) and left the user as a relatively peripheral concern. At the beginning of this study, when firms with known brands where chosen, the user–driven innovation was assumed to play a larger role in the leadership of innovative firms.

The four levels of attention in the analysis were preliminarily named

critical dependencies, central dependencies, peripheral dependencies, and loose dependencies. The term 'critical' has yet to stand a test to justify the centrality of the position of these factors in the discussion. If the test is positive, the second research question can be answered. The following section takes this matter further.

5.5 Test of Applying the Critical Elements on the Six Cases

What has been defined as an innovation in this study depends upon the judgment of the actors interviewed. Figure 43 provides a schema of the difference in time when innovation has occurred. In the Humanist case, for instance, the firm has been able to deliver significant novel products many years ago. Player Company has a long track record of innovation, but the stream has been discontinued during the present regime interviewed. All the other cases have established a track record of innovation in the past and were continuing to innovate at least up until the time of the study. In other words, at the starting point for the six–case comparison, four firms were regarded as 'innovative' and two were defined as non–innovative [Humanist and Player]: 'have been innovative, but are not currently innovative'.

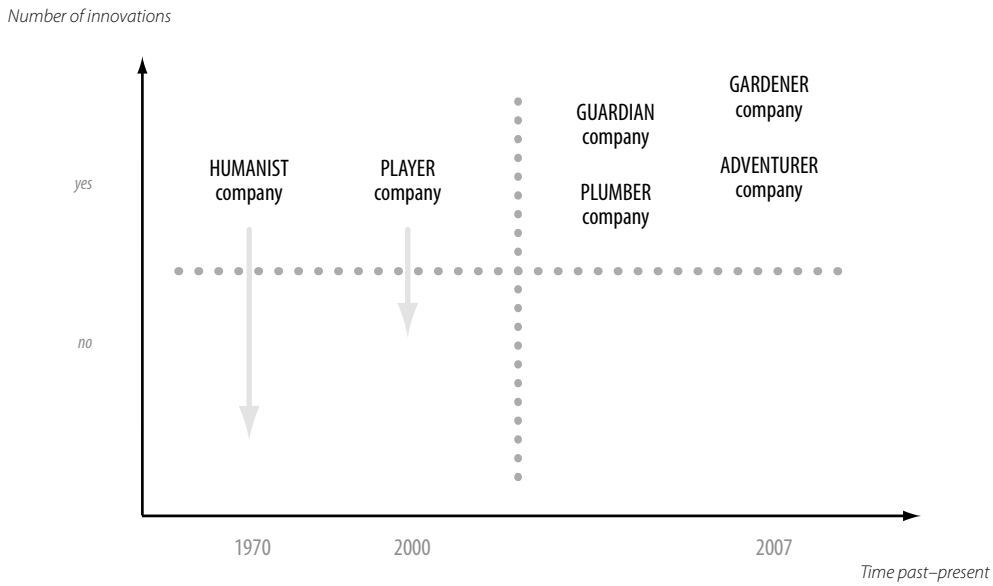

Figure 43. Positioning of Innovative vs. Non–Innovative Firms.

The following section conveys the story of a chosen innovation for each of the six cases. The stories are built on text extracts, built on the texts coded with critical key words. The purpose is to test if the material will provide a credible explanation for innovation in four companies and non–innovation in two firms. For all six cases, a brief description of the firm's background and innovations is provided, followed by a story narrated from a number of quotations filtered from the interviews. The story is then condensed to the key terms that occur in the story, and the recorded barriers associated with the critical elements are introduced as a complement to the story. The formal position of those who were interviewed and other key persons in the story are listed in Appendix G. Finally, an effort is made to link the story to the relevant theories presented in Part 2: Theories—the theories that supposedly explain what is occurring in these organizations and can help to predict the outcome in the six cases.

To limit the amount of text, the final part has only a shallow reference back to theory. The story text has been built and edited from numerous quotations, and the interviewees have been paraphrased—except in where direct quotes are used and marked.

5.5.1 The Plumber Case Story

The field of analysis is illustrated by a fraction of the discussion covering the critical elements in the Plumber case, in which the evolution of the touch–free electric faucet was brought to the world. The story goes back to what was seen as the electrification of a base faucet, initially engineered as a mechanical faucet. The contemporary labeling of the product appears in the stories as a more user–oriented 'touch–free faucet'. The firm also manufactures a series of single–lever faucets and thermostatic faucets which are technological innovations that are not discussed in this story. There is no evidence indicating that the invention is new to the world, but it is a novel product for the firm and new in the market in which the firm operates. Following is a narrative of the discussions with the interviewees from the Plumber Company.

> You could say that we had rolled tens of years into one technology. We were concerned that our S–curve was starting to plunge. We made good profits; the firm was well run; but we couldn't sit down and rest. We started to talk internally. I often discussed with Pat Ryder that despite how nasty it felt to mix water and electronics, we would see it one day it in our products.
>
> Foremost I recall *Margaret Thatcher*'s *speech*, referred in a magazine, in which she stated that the microchip would change all our lives. We couldn't understand that at the time, but of course we knew that things cannot remain unchanged. Among others, we were with Roger Islander and Pat Newman in England in a technology consultancy firm working for a month. The firm was making high technology in Cambridge. We were sent there without any particular assignment for Plumber Company. We

just worked there and Plumber paid our salaries. We became acquainted with this environment and technology and the English way of working. Later, in 1989, we were convinced that electronics would become part of the faucets in homes. That made us work systematically on this mission. We had a vision that we would produce electrical faucets, and saw many possible synergies between the single–lever faucet and plastic technology. We could never have made a business of it if we hadn't had enough skill in–house. We started to invest in new electrical competence. It is somewhat in conflict with today's talk about networks. Our sentiment is that we know the use of plastic, and our product planners grasp how plastic is used in faucets and know what could be done and in which places. They also know the kind of tools to use. We have tool development in–house, and that's why we know the best combinations of plastic and metal in our products.

In the beginning, managers and supervisors had difficulty talking with the electrical planners. It has been a big thing for us to learn to manage people of a different type, not to mention *those who invent* things—to manage to get us all at the same table. The trouble is that we can't lead electrical experts the same way we manage mechanical workers. I mean if they come from a software house, sitting by the beach, working downtown, going to work at 12, and leaving at nine in the evening. At the same time, an elder machine workshop engineer comes in at seven and leaves at half–past three. They talk about entirely different things; a *software bloke* talks about bits. In that sense, I think we are actually world–class leaders uniting these things. Many have chosen to ask firms focused on supplying plastic components. However, they don't know the product, and then the research and development phase is difficult. No *developer* can work 100%, unless he knows the materials and the manufacturing methods needed.

We give pilot products to our staff first, then to selected customers. We try to test installations within a one–hour drive from here. Still it's a question of a faucet; if something really bad occurs, it can be very costly. We have the local hospital, but more in small clinics, where we've done more experiments,

because it's easy. There's a company doctor, and if something goes wrong, he'll call and ask us to come and see. In hospitals there's such a hassle that it makes testing more difficult.

It is quite a brain exercise when it comes to a new idea: the manufacturability, the idea of the product, the crafting of the idea, financing, and then the view of the market. Some new products are an improvement on existing products, modifying known technology, reacting to signals coming from the customers. Yet, if you have new technology, a completely new solution to the same need, then testing it in the field is difficult because the user has no reference point.

The product is operating in a wet environment, it's recognized by now, and that has put different requirements on the *electronics.* The electrical installations require a different attitude. It isn't like a mobile phone, because our product lives all its life in a wet environment. And it's battery driven, with a given operating life. We had great difficulty getting factory settings to meet the customer satisfaction level, because a reflection could come from the wash basin, which influences the function of the faucet. We saw early that technologically advanced products would be more expensive, yet that was not enough. We needed to combine this information to this design. When we sell to the food industry, design isn't needed; but if we sell to homes, it becomes part of the decoration. The price for the electronics is already more expensive than a traditional faucet—two, three times at most. It's clear that if there's no benefit for the customer and it's only more expensive and there is new technology, it's simply not compelling enough. A big thing is to reduce the manufacturing cost. The trouble comes when applying a high–class design, which is usually expensive to produce, and on top of it, add the touch–free technology. The price goes out of range. It becomes so expensive that we don't reach volumes, and we are still in a volume business, not in piece goods. No one is willing to pay what it costs.

We are forced to look at manufacturing costs, wages in relationship to cheaper–wage countries; and outsourcing implies that we had to put our product specifications in a totally different

order. In the case of manufacturing troubles here locally, we've just called the planner and the drawings have a lower priority.

In the beginning, there was a great deal of enthusiasm among the technical sellers—those who knew the product and had the courage to go out and sell it. I think the salespeople didn't dare to offer it in the beginning, in case the customer asked a question and the salesperson didn't know the answer. The salesperson would look like a fool. There is always a given recoil. We are clearly in different markets and it's dependent on the skills of the sales staff and their experiences, and their history; they've lived selling Plumber Company products. And surely the customers influence the sale. If somebody has been disappointed in some way, then the brakes are on. We see that in the faucet business you have to be able to influence the wholesaler, the installer, and the architect. They all are able to kick us out, but we have the view that if you can influence more than two of them, the deal gets done.

The turnover of the invention was as low as 0.3% of our turnover, and over five years we invested more than the value of the sales. Without the strong conviction of senior management and owners, it would have been difficult to take it through. Salespeople could argue that they need to make four customer calls to sell one of the new products, whereas drinking a cup of coffee and would allow them to sell 30 of the ordinary faucets. I think it's just human that everyone couldn't see the vision clearly. Of course the firm has done well, which has increased the credibility of senior management.

We could mark this year as the sales–take–off year. Of course, it has been tiny so far, but now we have a 40% annual sales growth. It's easier to believe in something when it starts to return cash. Nobody questions it then.

We have now realized that the faucet electronics are not enough. Pat was coincidentally at the local University of Industrial Arts and met with Archie Angel. They both found that the bathroom is a technical system, and that it doesn't consider design. It started when we both thought about it for awhile. We thought that Plumber Company wants distinction through design.

> However, the design alone would not be enough; Plumber would need to find a global brand. In the past, builders have had bad experiences relying on Italian products. They have complained to the architects about leaking faucets, and so on. It was made concrete when an architect came to us saying, 'Yes, finally, a top Italian design in combination with Plumber quality and the ability to deliver promptly'. I have clearly recognized the design society—all interior architects, interior press—and we were also awarded a prize. They said that this Archie Angel is, in their minds, a truly splendid thing, and 'How did you have the courage!?' Actually this is a cooperation—a group of three companies—a Swiss firm that belongs to a large sanitary group in Spain; a family firm of our size in Italy, making bathroom furniture with Archie Angel as the designer; and us as the faucet manufacturer. That's the concept.

These extracts clearly demonstrate a well framed discussion, and expose the myriad key words and connections between words. It is a simplified demonstration of the path from idea to product, clearly articulating the role of the critical elements proposed in this study. In this example, the *actors* can be identified as the designer authority, the owner, the mediating architects, the authorities of the design community, and the interests of at least two families. The *product* is acknowledged to be a faucet, bathroom furniture, concept, technical system, electronics, and design. The *dialogue* can be traced to a meeting, a need, realizing, recognition, thinking about it, somebody's mind, seeing, saying, and courage to make a decision. The *ideas* appear as finding, combining, designing, distinction, concreteness, and a splendid thing. Finally the *conditions* appear like a university of arts situated in Helsinki, design located in Italy, a lack of reliability to deliver in Italy, the firm's self–conception as a *faucet manufacturer*, and so on. Furthermore, the statements bear evidence of barriers, the time aspect, markets, appearance, and deliverables to the customer and partners.

The table 1 in Appendix F, illustrates barriers in the Plumber case: the broad range of frictions associated with their story as outlined here.

The friction in the *current* situation is exemplified by what has been labeled 'globalization', in which the decision making of customers is distanced to places remote from the firm. What were problems in the past, evidently overcome by time, were, for instance, the interpretation of impulses waking new ideas. The vision conveyed in an article by Margaret Thatcher illustrates well the dislocated nature of actors of innovation. In this case, the actor was the concept brought forward by a prime minister. Barriers that resemble the current problems are the hardships foreseen in the future, one of which is the retirement of one of Promotors of Know–how: 'We are going in a direction of an new managerial culture. Thinking of my successor, my duties will be divided in two. The grip will change'.

A similar sign is seen in a critical voice that regards the current situation as being too much of a one–person show. Finally, concerns of the conditions, a concern raised primarily as a future issue—that the firm will grow into a bureaucracy—may be reflecting the current situation.

The connection to theory of the critical element is also visible in the story. The deliverables of this firm's innovations can be identified according to the *theory of product innovations* from several aspects, both new to the firm and new to the market. Furthermore, the case is suggestive of *theory waves of innovation* going from product to process innovations. There are several pieces of evidence of the presence of personalities according to the p*romotor theory*, particularly the Power Promoter and the Promotor by Technical Know–how. To quote the technology director: 'I wouldn't say that this has been done by one person, but I have had both the product and manufacturing methods, and have taken a path that has generated a certain personal insight. Half an hour's walk on the floor and I know more than I would know by reading reports for two days. Furthermore, Pat has led this firm with strong ownership and integrity'.

There is explicit action in line with *knowledge creation* theory in terms of the discovery venture: the trip to the UK to see the environment and their way of inventing. That was where the shaping of the purpose or vision took its first steps. The story also reflects the theory of the firm,

particularly in the aspect of awareness theory of the formal vs. informal organization and the risks of bureaucracy. As the managing director Jack Straw said, 'If you could combine the business idea of a small company with some other company, why not a family business, even on a business on world level? But you create a bureaucracy that's too large and you lose your profitability. There has to be entrepreneurial spirit. Then it works'.

This discussion supports the *theory of culture*, the visible example being the active owner engaged in the firm. Another supporting cultural aspect was heard from the commercial director: 'Our cost accounting practices have allowed the project to go on for years and years. The innovation would probably have been discontinued long ago if the price for the venture had been known'. The story also connects to the *theory of mechanical and organic management systems*, when referring to the Italian cooperation model.

In summary, this analysis proposes that the story connects back to the following theories presented in Part 2: Theories: the product innovation theory, theory of waves of innovation, the promotor theory, knowledge creation theory, the theory of decision making, theory of strategy, theory of company culture, theory of formal and informal organizations, and the theory of organic vs. mechanic management systems.

5.5.2 The Guardian Case Story

In the Guardian case, as in the Plumber case, there are stories of several subsequent innovation projects. The original Guardian classic key, its root invention, is one hundred years old. The products of modern times clearly originate from the first, yet are radically more sophisticated. The chain of product generations featured are the Guardian Classic (1907), Guardian Alfa (1982), Guardian Beta (1985), Guardian Gamma (1995), Guardian Disklock Pro (1992), and Guardian Secure (1995).

In the mid–1980s, the management of that time had the *vision* that the world would change rapidly to electrical locks. They invested in both electricity–driven locks and infrared, maneuvered locks. However, thoughts of an electrical lock did not surface at that time. The project was said to be ten years ahead of its time. The infrared remote control mechanism was invented before it was adopted in cars. As an idea, it was superb—a top product, a super lock. A few thousands units were sold, but the product development cost some 15 million euros. It was seen as a tremendous disaster, although parts of it could be used later. The decision–making process was blamed, along with excess enthusiasm. The case stood out as the downside of organizational autonomy. The good thing about autonomy was that individuals felt that they carried the responsibility. The downside was the difficulty of monitoring, in combination with a lack of transparency of intentions. As the managing director said, 'No one was told anything, and things went too far'. The driving forces of this case were not fired, however; the organization started to sense their failures and the activists merely looked for work elsewhere.

The product technology situation in the firm became critical in the 1990s, as the product's patents started to expire and the firm was headed in the wrong direction. Technically, the duration of a patent is 20 years. However, the effective commercial time of a patented product is reduced at the beginning of the period by the time needed for patenting and sales take–off at the beginning of the period and at the end of the period by customers holding their orders as they wait for the launch of the next product generation. The effective time for exploiting a patent is realistically diminished to 10 years. An extension of the patent was applied for the Guardian Pro product, which had functional problems. But the firm did not get the patent renewed for the original invention. Patents serve the purpose of allowing the firm to prevent a commercial supply of copies. Because the security of the lock is lost if copies come on the market, copies are fatal. And patents are important for marketing use. In markets like North America, Europe, and Australia, the claim of patents is vital. Without them, the firm would have to drop out of tendering

to such organizations as government, defence, and banks.

The pressure came from Canada when the patents of Guardian Pro were due to expire. As it was not possible to extend the patent of Guardian Pro, division director Kim Strong decided to expedite the alternative Guardian Secure project. Kim Strong had been in the firm for several decades, with several assignments on the management team. His superior, president Mathew White characterized him as the grand old and experienced warhorse. Kim Strong's instruction was, 'We need to have a innovation in a year'. Of course that didn't happen, despite the fact that there were skilled people doing their best. Schedules made no difference. They went back to do more homework. Two fellows were assigned to look through past announcements of inventions, past templates, background materials, and archives. Jacob Evans, who had been the manufacturing manger, was assigned to be project manger, subordinated to division director Kim Strong. The search was made in the archives of all documented ideas dating back many years. An unexploited idea of the past was reintroduced. A technological solution that had not been applied before—grindings on different diameters of the key and a different disc technology—created a lock that was absolutely resistant against lock picking. 'There were two major inventions behind this. First, the grinding was not on the same diameter. Second, something invented in the early 1980s was applied for for the first time here: disc technology that hadn't been applied earlier because the manufacturing technique wasn't solved. It wasn't possible in the past'. A new technique for manufacturing brought life into the idea, which had been left aside as impossible by those engaged a decade ago.

The innovation became one of the most successful in the modern times of the firm, mainly because of the high quality security of the lock, but also for its functional dependability. The sales growth went straight to the global scale, and how swiftly the invention came about: in 2½ years. When a novelty is launched, it commonly takes a couple of years for the process to be completed.

The extreme precision of vital parts inside the lock cylinder, the tolerances, and how they are manufactured, were crucial requirements of the idea, which also reflected upon the supplier of machinery and tools. The many yearlong cooperations with a Swiss technology company proved to be vital, as they were experienced in making high–precision products.

What further accelerated the project was the possibility of using the tools that had been used for core components of an earlier–generation product. Not only were those tools costly, but the prototypes were also possible to make with genuine production tools. It enabled a particular solution to be verified rapidly. Specific key components could be tested to ensure that the developers could see it actually working. It enabled the firm to manage exceptionally broad field trials and test installations. Along with field tests, machinery tests and laboratory tests are typically made as well. They could be cut back for the benefit of getting the product out in the environment—in the field—and gaining experience.

The invention stood the test in highly demanding places like in a university hospital. There were many keys in circulation and they were often in use. With traditional types of locks, the key and the lock cylinders tend to deteriorate, operational problems may be encountered, and locks may need to be changed in as little as a year after installation.

A network of experts, both internal and external, contributed to the process. The firm had contact with a person in the security police who was known to be a true expert. He ran their tests independently, and could validate the security requirements. The firm defined the requirements of an ideal product, considering the life cycle, as one meeting the requirements of safety, convenience, and longevity, and resistance against lock picking. The security community has an inner circle, in which it becomes known what experts recommend. They worked as messengers for the firm and news about the innovation therefore spread through security authorities to the market.

The abstract of this story, like the story of the five other cases, has been built by screening those quotations connected to the actors, the products, the ideas, the decision making, and the conditions coded in the empirical material. In this case, talk about the *actors* appears as the management; the driving forces; the grand old division director, Kim Strong; the president of the firm Mathew White; the project manager, Jacob Evans; skilled people; two innovative fellows; a security expert; the inner circle of expert people in the security community; messengers; and the security authorities. The *products* are introduced in the story as the range of products with different names, mechanical locks, electrical locks, copy products; and various examples of product technology like infrared mechanisms, diameters, grindings, and cylinders. The *ideas* introduced are in terms of a vision of a changing world; new electronic thinking; an analogy with the car industry; alternative development; impulse scouting; the exploitation of a historical idea; a combination of grinding and manufacturing techniques; solutions; definitions; prototypes; laboratory; broad field tests; validation of an idea; and lock requirements like small tolerances, convenience, functional dependability, and lock–picking resistance. *Decision making* is represented in the story by pressures from the market, needs, the thinking, sensing, enthusiasm, feeling of responsibility, claiming, blaming, firing, waiting, cooperation, proposals, contributions, recommendations, and the decision–making process. Finally, the *conditions* are presented as the changing world, the changing industry, organizational autonomy, 'no–one told', 'things went too far', references to the history of a failure, organizational sentiments, a situation of expiring technology, pressures from Canada, global acceptance, authority ruling, and a sample of the actual operating environment of the lock in the form of a university hospital.

The major *barrier* (Appendix F2) represented in the story and behind the story was the fatal product venture of the electronic locking system, which was said to be ahead of its time. It evidently resulted in a waste of human and financial resources, but it may also have led to a situation in

which the existing product technology was becoming outdated. In short, one condition resulted in another difficult condition. The price was also an organizational sentiment that smoked out the activists of that time. Organizational autonomy backfired, because of a lack of transparency of intentions and malfunctioning decision–making processes. Recovering from the situation was difficult, because innovations cannot be scheduled, and that situation conflicted with expiring patents, which followed a schedule. When a lucky strike brought up the needed innovation, the barriers were primarily technological. The technological challenges escalated indirectly into problems with the cooperation with a long–time partner of solutions. Changes in the driving forces of the partner organization were said to be behind the inability of the partners to respond.

The interview data from the Guardian case for deliverables is in accordance with the product innovation theory framework. The line of new technological solutions mentioned with respect to novelties in the introduction of this story are all new to the firm, new to the market, and probably new to the world. The last suggestion is based on the fact that these solutions have had international patents, which is in accordance with the *theory of deliberate or emergent strategy*. The product track record supports the *theory of generic strategies*, in that this firm clearly strives for product excellence. In the Guardian case, the *theory of the environment* and *the theory of the situation* creating propensities are well recognized. As time passes, the situation changes—and changes dramatically when it comes to the expiring patents that are strategically vital for the firm. As the story portrays, the situation works sometimes in favor and sometimes against the organization, as exemplified by the unfortunate electronic locking system and by the successful lock studied in this case. The theory of disruptive technology clearly enters the scene in the unfortunate case. The case of failure also emerges as an expression of the *theory of strategy*—in this case, the wrong strategic vision. Furthermore, the failure brought to light the border that was also described in the *theory of formal vs. informal organi-*

zations: 'No one was told and things went too far'. Evidently the theory of autonomy in the decision making alone is not a good predictor of success. The story tells something about the *theory of values*, observing the way the activists of the failed project left the firm.

The theory of the situation is exemplified by finding the innovation in the successful case. The idea was an old one that had not been applicable in the past. Now that time had passed, supportive technology had developed, and the idea came into use. The response to the situation in the successful experience also introduced traces of the presence of *the knowledge creation theory*: attempts were made, evaluated, then reiterated by trying to give life to implicit knowledge by going through archives of inventions, old patents, and so on. The case also demonstrates the *theory of prior knowledge.* That process eventually raised technical solutions, which was the source of one of the most successful cases of the firm. There is also evidence of the presence of the *promotor theory*. Division director Kim Strong has characteristics of both a Promotor by Know–how and a Promotor by Power, because of his long tenure with the firm and his experience. To quote president Mathew White: 'He is a dead enthusiastic engineer, an innovator who is following the development of technology, and he understands and is on top of things, insuring that there is always something in the pipeline. He is our Grand Old Man. He masters many fields in the company, as he has managed many functions in the firm'. As Mathew White added, 'Let me draw a picture: When the sales value of a sector or innovation grows to the value of €50 million, we separate the operation into our own business unit. They are given all the R&D resources they need to grow their business. Now, when we track them with a full profit and loss statement, it has led to the division director's tendency of the division director to be extremely cost aware, no matter how much I encourage them all to increase spending in R&D. Only once in all these years have I interfered in their plans'. As division director Kim Strong said of Mathew White, 'He is a philosopher'.

These quotes show that Mathew White is engaged in supporting, but influences indirectly through the organizational structure, appointing

the head of the division, and setting requirements on financial measures. The third person interviewed, project manager Jacob Evans, also had long tenure in the firm, particularly as a manufacturing manager. As he said, 'My ordinary duty was manufacturing manager. That was probably why I was chosen to be the project manager. They reckoned I had knowledge of the production and I didn't need to be briefed to know what to do. When the patent was granted, I started making the prototype series and the product in order to make it feasible for mass production.'

As a final point, the case also highlights evidence of the *theory of waves of innovation*. As division director Kim Strong said, 'This was done incredibly fast; there were no technical weaknesses. Usually when we launch a product it takes two years to complete, particularly if we have to update the production process'. The president's statement also highlights the interaction between an organic and a mechanic management system. In this case, the *theory of organic and mechanic management system* is evidently in balance, predicting success.

In summary, this analysis proposes that the story connects back to the theories presented in Part 2: Theories. The story may be described by the following aspects: product innovation theory; promotor theory; knowledge creation theory; formal and informal organization theory,; mechanic and organic systems of management theory; theory of values; theories of strategic vision, excellence and deliberate or emergent strategy; theory of environment and situations; and the theory of decision making.

5.5.3 The Gardener Case Story

This story tells of the evolution from a factory focusing on office scissors to a garden tool company. At the center of the story is highlighted primarily the innovation that initiated the evolution of a long series of garden tool innovations. This case differs from the others in that the case firm is part of a conglomerate of companies. It faces a slightly different set of challenges, therefore; but the heart of the innovation activity is comparable to the

other cases. The firm has presented a long series of new scissors and garden cutters, in which the elements is always a new function, a new benefit from using the product, and a distinctive design.

> There was a crisis, when the domestic market was hit by *a 40% decline* in a year. At the end of the 1980s, there were financial problems, and the operations were not in good shape. There had been overly optimistic investment in production machinery that was primarily utilized in only one work shift. The company delivered *only old scissors*, which dated back to 1960, from the time when the firm first specialized in scissors. The background to the focus was unrest in the firm for standing on ground that was too weak in too many fields.
>
> Newly appointed managing director Jean Putman was the first to see the opportunities. The managing director soon arrived at the opinion that the firm had to use its skills on something other than scissors. It needed an additional leg to stand on. And that it *needed to grow* in the world market in order to survive.
>
> The managing director was trying to learn the activity and do something clever to get the finances of the company *turned around*, which he managed to do quickly. He enlisted the help of US colleagues who liked certain proposals that he had made. The factory started producing additional volume, which made the wheels start spinning, a situation that is usually reflected in the financial status of a company. If the firm can manage to do it without extra cost, it is better yet.
>
> By then, chief designer Oscar Wood turned his mind to the situation, 'You devil', he said, 'the ship is afloat', and the management was able to get the threats off their backs.
>
> The firm was known for its scissors, which led the interviewees to elaborate that they could transfer something to the tool business and learn something as well. From this came the idea of the garden and *cutting tools in the garden*. (Cutting tools could be made with the same machinery as was used to produce scissors). From that followed the question: 'How

could they be further utilized with a small investment'?

The undertaking was a risk in a grey zone. The firm had developed a new technology, 1S, and was curious to see if it could be made cost effective when applied outside the current business. And it was a risk, as the firm had not been designated the role of *making garden tools* in the group. The garden tool development was unauthorized from the beginning. It was a company decision that the UK sister company took care of the garden tools in the group. The activity was therefore masked as a pilot study, and took place undercover as a technology project. That was how it was marketed in order to get investment funds approved by the group management, which made the decision that garden business was not the business of the subsidiary.

The case demonstrated a situation that is typical in companies: There are limitations that appear to be rational, like one unit being authorized to produce *garden tools*, while another is not. At the same time, there is no free competition, and no efficiency improvement was taking place. The firm was not aiming through irrational internal competition to obtain shares from the UK sister company. Difficulties arose, as units were seen to compete for the same interests. However, competition was regarded as sound if there was a great deal to compete for or in cases in which it was founded on technical substance, better advantages, and better designs.

The *1S technology* was entirely new. It was chief designer Oscar Wood who furnished the idea. There were cumbersome mechanisms and geometry. Systematic work had already been undertaken in the model phase to straighten out many things and fit details together. The discovery of 1S was associated with unknown manufacturing technology, or known technology that was applied in a new way with new materials. The firm had been dealing with scissors and blades in an old fashioned way. What they invented was a new way of producing garden tools cheaper than their UK sister company could do. Whether the construction was possible or not had come up for discussion two to three years before the

solution became a reality. A driving force was the intuition of managing director Jean Putman, who took the personal risks.

The making of the new garden cutter products was feasible because it utilized the same machines and the same raw material that was being used in the factory. Management believed that it had been a stupid mistake to have missed the opportunity. There was free capacity, and it was evident that they could meet the price and cost requirements. The UK sister company did not even come close to the price level; its price was three times that of the domestic price. Nor did it come close to delivering a similar product. The domestic solution was superior in its simplicity—a unique product that seemed to sell itself. Furthermore, the firm on which the case was built had better in–house skills in the making of manufacturing tools and the ability to build test tools and take experimental risks. When the first cutter model was manufactured, at least *ten attempts were made before* it worked. Management claimed that dislocated operations situated in places like Taiwan had prevented development. If it had been done overseas, it would have forced the development into standard solutions.

The firm had many factories around Europe at the time, and Jean Putman had a relationship with and visited his colleagues frequently. The managers in these factories also paid attention to new ideas and products in the firm. Just like in Germany, the relationship was mutual; they were each other's customers. At that time, however, the cross–selling and cooperation with colleagues was made difficult, as there was no job named 'internal selling'. Two–thirds of the firm's sales went through sister companies in the group. A sales organization was assumed to be useless because of the inter–company structure. Jean Putman concluded that it was stupid for two–thirds of his sales to be in the hands of no one in particular. From this situation followed his personal strategy of building networks of contacts and relationships.

Consequently, Jean Putman assumed the position of sales manager, while continuing in his role of managing director, in order to boost volumes and justify further investments in his firm. He wanted to tell people what the company was doing and

informing them about the future changes in its products. In the beginning, he traveled a great deal. Later people started to come to his company; the firm became regarded as more significant, and outsiders became curious about what was happening in the firm.

Chief designer Oscar Wood had made *scale models of wood* for a new garden cutter, and the managing director traveled to the USA accompanied by technical leader Steve Richards in order to meet US colleagues in other subsidiaries of the firm. He traveled in connection with cooperative projects, trying to determine the volumes that could be produced. (The firm sold free capacity and needed more work). In this way, management came into contact with salesman Bert Hyde, who had contacts with Wal–Mart. The new cutter was not revolutionary at the time, but the technology was. With Bert, they elaborated what *the product would cost,* calculated the price in reverse, and came to 'This is so close we have to make it'.

Managing director Jean Putman approached through the back door, neglecting the formal organization. Eventually even his superior higher in the hierarchy became interested in the technique, became involved, and liked the idea. Jean Putman mentioned his case to a manager at an even higher level, one who saw the idea as a smart one. Having seen the prototypes, the US colleagues within the Gardener Group placed an initial order for Wal–Mart for 300,000 units. Jean knew that he would receive the backup he needed from his superior if he went home saying that this is what the big boss in US wanted them to do. When a customer's money was on the table, things got going and investments received easy approval. The payback time for the initial order was calculated to be three months.

The problem was that they had *not yet made the product industrially*; they had only experimented with prototypes and prototypical tools. It was close to a disaster, as there were many things to be balanced and they were running out of time. This was a big problem, as Wal–Mart was a dominant customer for all the business units in the USA, and it did not tolerate mistakes. The US business units were dependent on it. As the

chief designer said: 'It was a narrow escape to avoid hanging; they would surely not have poured heaps of pride on us if we had failed this deal. It would almost have resulted in anarchy!' The last shipment was sent on time the day before Christmas Eve. The next year, more than one million pieces were ordered, which was a substantial volume for the factory at that time.

After the initial garden product, the internal *acceptance of the firm was at a new level.* It had gained credibility through the first product. In the beginning, the firm did not have the legitimacy or the authority to operate in the garden niche. Later it developed a series of three related products, and within two years, they were in almost every garden distribution center in USA, including Target, Costco, and the cooperatives.

Jean Putman's and Oscar Wilde's *personal contacts* had led the firm down unconventional routes—like the German salesperson who had contacts in a German coffee house, which opened a route to the European market for the firm. In the USA, however, there was no similar garden distribution channel at the time. The German coffee house provided the solution for many years. It had an enormous distribution, the idea of one–time sales events, and buying in large volumes.

It could have been strategically doubtful to take the route through hard discounters and disposable distribution channels. The *coffee house distribution* was unstable, and the Gardener Company was, for them, like 'the butter on the sandwich', as the chief designer said. Still, the coffee house distribution demonstrates the fluidity of the criteria for strategy. By conventional brand–building criteria, the deals were embarrassingly poor; still, they gave the firm proof that it was on the right track in its product concepts, with revenues enabling the firm to continue to invest in new garden tools. The deals in Europe had not been made without contacts with the leading retailers in the USA. Generally, as the friends in USA thought something was good, and the price–quality ratio was good, then other members of the network of colleagues started calling in their interest and orders too.

Once again, the narrative includes a unique quality of the five key attention areas for the firm: the actors, the product, the ideas, the decision making, and the preconditions of innovation in the firm. The *products* in the Gardener case were scissors, garden cutters, and industrial products; product concepts like tools; and technology like blades, raw materials, designs, functionality, mechanisms, geometry, and construction. The key *activists* of the story are managing director Jean Putman as the driving force; chief designer Oscar Wood, and technical manager Steve Richards; working with people on the floor and networks of intra–firm contacts like the US colleagues; the salesman Bert Hyde; the US management; the manager higher in the hierarchy and his manager, the president in head office; friends; and a network of colleagues within the Gardener Group. A member of the board also played a part behind the scenes.

This narrative reflects upon *invention* as the origin of the ideas, either as aims or as requirements. Aims are represented by optional resource utilization, applying solutions across borders, and discovering combinations of old and new in a new way, resulting in new solutions. Requirements are represented by the obligation of cheaper products and the simplicity of solution. The story also addresses deliverables of invention like the scale models of wood models, prototypes, the pilot of the 1S solution, standard solutions and improvements of technical substance, proofs, or any other smart thing. Finally, the invention is discussed in terms of how to introduce the deliverables as systematic work, the experimenting, tens of attempts, and taking unconventional routes. The *decision making* and the associated dialogue appear in the story as the trigger, like visits, traveling, personal contacts, the wish for something, the need of work, the need to grow, curiosity and paying attention, and proposals. Decision making also brings into the discussion emotions like unrest, liking, interest, and embarrassment. The processing of the matters is introduced as cooperation, building mutual relationships, elaboration, helping, justifying, striving for rationality, dealing under cover, going in through the back door, going forward without authority, sometimes even

anarchy. The ending decision is then described as conclusions, changing opinions, conviction, and backup for the decision. The end has not always been happy, as terms like 'hanging' and 'firing' become associated with the decision making. Finally, the narrative highlights the implications of firm leadership—*preconditions* for innovation. It is introduced in terms of the situation like instability, market crisis, and a prevailing turnaround of the business. The situation is also connected to implications of the location of premises, as the tradeoff between the local or overseas premises of manufacturing is an issue. Conditional implications are also addressed in terms of organizational settings, articulating a movement to rationalize a too–extensive network of factories, division of labor between subsidiaries, and the mixed blessing of the US head office. The organizational debate goes hand in hand with the rationalistic and deliberate strategy of the firm, subsidiary specialization, internal competition, funding policies, image, legitimacy, authority, and the acceptance that the subsidiary firm enjoys as a garden business. There was little acceptance in the beginning, but it was gained through the merits of the innovation.

The major *barriers* of the story, and behind it, were the fight for survival and existence and adverse company decisions. The legitimacy to deal in the garden business was unauthorized due to company strategy. Consequently, it led to disobedience and undercover activity with high stakes. The play took place under threat of being fired from the organization. In this case, the practice eventually changed the strategy, under the constant condition of the subsidiary firm having to deliver both novelties and profit on an ongoing basis. Behind the story emerges the retirement of the driving forces, and future risks are foreseen in the succession of know–how and authority. This case demonstrates a multi–dimensional view of the five critical key factors. Despite the long list of barriers and hardships, the firm demonstrates a solid track record of innovation and profitability simultaneously. It goes to show, in this case, that the strength of the actors to maneuver and influence under difficult conditions put off to a high degree the hardship of the story. Probably the

challenges themselves are a driver sustaining the ability to be innovative.

The case has the most solid track record of product innovations among the cases studied. As managing director Jean Putman said, 'Over 15 years we have had two, well three products that are new to the entire world—something unheard of—that we have 80% managed to gain patents for'. Beyond that the firm has every year 'delivered something new'. That goes to show that the case fits well into the framework of *innovation theory*. There are also indications in this case of the theory saying that product innovations are followed by process innovations. And there is evidence of the presence of the characters according to the *promotor theory*—this time in three roles. With his solid track record of profitable innovations, the managing director acts as a Power Promotor and has the authority to allocate funds and assign human resources: 'When we go for it I look finding the funds. Nobody else is to be blamed if it fails. I am responsible and I do not delegate it. I am personally taking the risk. They have seen me in the heat. They trust me in this sense. It takes their minds off the fear of losing their job for stupid things'.

There are actually several Power Promotors. The chief designer contributes to the role of Promotor by Know–how, being highly knowledgeable about the product: 'We have learned to combine technology and materials. We always try to keep four factors present in a new product: preferably improved functionality, possibly new technology, new material when the costs make sense, and finally design that support all this'. Technical leader Oscar apparently acted in the role as Process Promotor as well: 'In negotiations we combined our experience with our production manager; he made an assessment of what it requires of the production and made calculations, and afterwards he was fully in the picture to manage to do the tools and take it to production'.

There is also evidence in this case of the *theory of deliberate and emergent strategy*, and how the environment and the *theory of the situation create propensities*. The firm was in crisis, and was forced to do something about it. The strategic role designated to the organization as a scissor factory,

however, was seen as insufficient for survival. The strategic undertaking was presented as a technology project, and the actors characterized the line of action as 'unauthorized' and 'close to anarchy'. After the initial garden product success, the factory gained credibility and acceptance as a garden tool company.

The case also illustrates the *theory of mechanistic vs. organic management systems*. 'When we reach this point, you go in for implementing, like "this should be completed 1st of September as the exhibition starts the 2nd". Then we had better forget the artistic and get going, where project schedules are firmly in the picture'. The example also shows a particular inflexion point between the *theory of organic vs. mechanistic management systems* and the *theory of the firm*. As noted in the theory of the firm, the organization has the ability, using the *theory of sequential attention*, to describe where conflicting priorities of the organization do not collide. In the Gardener case, the timing of the implementation is specific: 'We do not name it a project until we get the financing for the undertaking decided'. The case can also be connected to the theory of *organizational equilibrium*. As the chief designer said, 'I was asked by a journalist what my driver was that I work eagerly like this. I responded that it was to keep the nation and this village, and through them, myself employed. I could, say, let the hundred workers go, well aware that then I am also without work. But I do not say that'. The phrase 'keeping the factory' alive is repeated in all the interviews, and indicates that the *theory of values* is vital in predicting the success.

The tension between the US head office and the firm appears to be a constant factor in the history of the organization, which connects the finding to the *theory of company culture*. Although the force from the head office is perceived to be adverse, it triggers we–will–show–them thinking that has been a positive driver for many years. This leads to the conclusion that the *theory of company culture* is visible in this case. The story also unveils the obvious relationship to knowledge creation theory connected to the structure of the firm. The production manager said, 'We have product

development, tool construction, and knowledge of the manufacturing process in–house, around the same coffee table'. and the chief designer commented 'We had better skills, to start with. Not much better, but still. But we had the tool making and the ability to build test tools and take risks that you cannot experiment with if the production located in Taiwan. When we made the first cutter model, we made at least ten attempts before we made it. Imagine doing that somewhere far away. You are forced to standard solutions then'. The statement also shows that the *theory of knowledge creation* is in the picture.

The statement also points to *prior knowledg*e, as in the statement of the managing director: 'Everything is not ad–hoc, just because it is understood like that. The chief designer and I have been around for very long time and have collective experience based on many facts gathered over the years, based on many discussions with representatives of this industry and professionals, and based on a great deal of literature about customer behavior, and numerous enquiries that we have made during the years. Many think it is guessing. People believe we take it out of our sleeves. But it isn't up our sleeves; it's in our spine'

In summary, I propose in this analysis that the story connects back to the theories presented in the Part 2: Theories. The story may be described by the following theoretical aspects: product innovation theory, theory of waves of innovation, theory of promotors, theory of deliberate and emergent strategy, theory of product excellence, theory of the situation, theory of mechanistic and organic management systems, theory of the formal and informal organizations, theory of sequential attention to problems, theory of values, theory of company values, theory of prior knowledge, theory of organizational equilibrium, theory of knowledge creation, and theory of decision making.

5.5.4 The Adventurer Case Story

The Adventurer case is a story in which a new technology product spearheads change in the industrial concept of the firm. At the centre of this narrative is a one–design yacht, which is radically different from the firm's offering. Throughout its existence, the firm has presented some 50 models of yacht, always involving new technology, new hull concepts, and new style designs. In the past, before the ownership change, the firm launched one new product project a year. When the new south European owner entered the firm, it had three new product projects ongoing every year. At the time of the case project, the firm had a good order book because of the general rise in the world business activities.

> The uniqueness of the firm is seen as the combination of feel–good performance, reliability, and beautiful ocean–going yachts—even if it is not completely the latest fashion. In order to offer the best yacht in the world, the firm strives to secure the best know–how and experience. Or, actually the firm secured the access to knowledgeable people The firm acts as an integrator of competencies, not only in production, but also in the technical office. As managing director Schon Mitchell says, 'Innovation is also much about the business model'. The firm regards itself as innovative in its mixing of components, in the way it lives up to customer guarantees for a positive yachting experience, in and the safety and reliability of ocean–going conditions.
>
> Customers were recognized as the main source of innovation at Adventurer, primarily because they usually had a wealth of experience with the product—more experience than the staff of the firm: 'We don't live the products', as one interviewee said. The customers were rarely first–time yacht users, and there were said to differ from first–time users in their attitudes and approaches to sailing. They could be racing–oriented or cruising–oriented sailors. There were also actors who were referred to as friends of the firm and who acted as customer representatives.

More specifically, they were close associates or advisors of the customer. The downside of these people, who tended to be strong personalities, was that most of them strongly believed their own ideas. Although management was striving for standardization, it recognized that there was a limit to its ability to impose solutions on the customer. The upside of flexibility, however, was that customers entered the organization with new ideas and new ways of thinking about the yacht. In certain cases, there were people with enormous experience who gladly shared it with the firm and helped Adventurer improve the product. The company strove to encourage the designers in the technical office to be part of these discussions and to become open to influence. In the next development case, they would be more aware of solutions: what the customers really were looking for. Talking with the customer was an area of investment, and the specification of the boat was the most important part of that relationship.

It was a customer—Lucifer Lancaster—who initiated the discussion about a predecessor of the Exodus 45 yacht, and he wanted to proceed with its production. However, he had his own wishes and agenda. He had a tendency to head the prototype development project in his own direction. Eventually, the adventurer was not able to reach a deal with him. The yacht project at that time was named Formula 42. That is, on paper, there was an evolution of a seize 42 yacht as an idea, but it newer materialized. However, that project was followed by the idea of the Exodus 45 yacht. The idea probably came from the owner's office in southern Europe that the firm would start to build an Exodus 45 yachts as a serial production, or a simple yacht. Throughout the process, the project was labeled 'cheap yacht', 'entry level yacht', 'production–efficiency–optimized yacht', 'pure racing yacht', 'third–party–built yacht', 'pilot yacht to restructure the entire firm'. Eventually the idea evolved into building a one–design yacht forming a new yacht class.

This time it was primarily the naval architect George Beaver who pushed the project, and the owner Fred Leroy and the marketing director Ernest Young who saw an unmet potential need

among the present and potential yacht owners. It was evident that that people competing according to different measuring principles and fighting over the measures were ready for an advanced and uniform class yacht. There were other similar successful ventures in the market—companies that spotted the gap in the market and were able to supply a furnished one–design yacht.

As a one–design concept, the Exodus 45 was in strong contrast to the rest of the firm's offerings; customers were used to feeling complete freedom of choice and customization when ordering a yacht from Adventurer. However, the salespeople and agents argued strongly that customers who deviated from the one–design concept were essentially on their own. Any one–design yacht concept, in principle, is formatted and locked into that formula. If substantial changes were made, one could no longer talk about a type of a yacht class. The accumulated sales of the Exodus 45 yacht also generated recognition, and in a short time, it became an established class. It also followed that a growing number of people understood properly what was the yacht concept offering.

In order to promote the class, the marketing director Ernest Young and his staff ran a racing circuit. It was clear that something structured in that field was added value for the Exodus 45 yacht. The participants were a relatively exclusive club of people who played and raced with these Exodus 45 yachts, and the press liked to follow and write about them. It created noise in the media and gave the firm free publicity. It followed, then, that the firm's yachts gained greater appreciation for their performance attributes. The firm again achieved the brand reputation of being a fast and beautiful yacht—not merely a beautiful yacht.

It was a radical idea for the firm to have the yacht built exclusively by contractors, and contrary to the usual way of building yachts in–house from beginning to end. The production role of the firm became primarily yacht assembly, and most of the other work was redistributed to a network of partners. The network, the relationships, the division of labor, the deliverables, the reporting, and the practices grew simultaneously with the development of the prototype. The newly recruited partners

of the network were engaged in the building of the prototype. The firm provided skill transfers, quality standards, schedules, and cost levels. The Exodus 45 venture was organized into a separate business unit organization in order to stabilize the team. The operation was tracked through its own profit and loss statement. The separate organization lived in their own protected environment with their own priorities. The major misfortune in building the new product concept and the industrial concept was faced when a supplier did not meet quality standards. The testing failed when sales of the yacht were undertaken prematurely and a faulty component entered the market. The firm usually tested the technique of a new yacht and had the problems weeded out from the beginning. In this case, however, it was not unusual for the sales effort to begin before the actual launch, and the product was sold before it was ready to be produced in numbers. The faulty component was replaced through an extensive replacement operation, and Adventurer's quick response to the problem prevented a decline in the customer appreciation of the Exodus 45 yacht.

The major impact of the Exodus 45 venture was on the industrial concept. The concept and the network organization had turned a product line from unprofitable to profitable by eliminating slack time in the production process. After that, the firm started to work increasingly with the same strategy, with the assembly department serving as the 'engine', which was employed and optimized with maximum force, and the rest of the supplying processes adapting to that. It meant that instead of hiring a large number of people when there was an increased need for capacity, the firm relied on a network of companies working for the firm. The Exodus 45 product and the industrial concept further applied later in the Exodus 40 yacht, and the product concept was reapplied in a later yacht: Exodus 60.

Adventurer guaranteed the engineering if some fault occurred on the yacht. This warranty was possible because the firm had documented and knew exactly the technical details of the solution, even if the yacht was 40 years old. The drawings served to identify

the product and enabled skilled carpenters to build the yacht. Further the drawings served to control and speed the process and manage the flow of materials in time. Finally the drawings had also brought about the building instructions system in the firm. The yacht design concept had evolved over hundreds of projects over the years. From the beginning, it was rooted in the vision of founding entrepreneur Peter Paul, who believed in always using the best materials. He believed that first naval architect of the firm George Beaver from South America was the best designer at that time—at the same time fiberglass became the substitute for wood as a building material and female moulds began to be used enabling the replication of products industrially. The decision to rely on external designers was the firm's initial innovation, and it had resulted in working concepts adapted to that strategy. Adventurer employees who had participated in this cooperation had become professionals in their field. Many people had worked with the naval architect from South America and had mastered his skills. As technical director Keith East claimed, 'Even if the main design is outsourced, the cooperation is, in any case, so well integrated that it is part of the firm's core competence'.

Compared to smaller firms in the industry, the technical director said that there had always been funds for creating new products. If they have needed to test a material or perform technical calculations on a component, it has always been a straightforward process, even when the firm could not always afford it. It was evident that they would look for a product that was as good as possible, especially when the customer was paying for it. There seemed to be a local 'voluntary do–it–together spirit' among people in the firm; what needed to be fixed was of mutual concern, and they did not bother about the financial aspect.

It used to be in the late 1990–ties technical director Keith East, former managing director Luca Reynolds, owner Leroy Fredman, and naval architect George Beaver who were the foremost drivers of the new project development. Owner Leroy Fredman in southern Europe was a keen supporter of the Exodus 45 project. He gave public statements to the press on several

occasions and spoke at competition venues. After managing director Luca Reynolds was succeeded by Schon Mitchell, idea creation was said to have moved from the domestic yard to the office of the southern Europe owner. Marketing director Earnest Young was said to be the initiator of the new product ventures, having taken responsibility for assembling the design brief. In the Exodus 45 yacht case, managing director Luca Reynolds assigned the resources and decided upon the divisional structure of the organizations. The technical director primarily oversaw the technical aspects, trying to pave the way for a coordination of the total yacht, while relying on input from the naval architect, draftspeople in the beginning of the planning process, and those building the prototype in the end. Many things needed to be briefed and many professionals needed drawings and materials to be provided for conducting the work. As technical director Keith East said, 'There are very few in our pack with a general picture of the entire process'. He also managed the contacts with the research institutes and the classification society. Division director Teo Todd took responsibility for the venture, starting from the second prototype. At that stage, the task was to assemble the organization and the network that took the operations to an industrial level, assembling and delivering yachts. Along the way the development project, project manager Ouden West was in charge of documenting the process, drafting the final specification and building instructions that were later used in sales and industrial production. During the development process, he gained a deep understanding of the product, and that understanding became his sales pitch when he assumed sales responsibility of the product line.

Product development and engineering was said to work well; what did not work for the firm was manufacturing, which, as the technical director said, was necessary for 'the organization to get money out of the operations'. The firm was working on the profitability of the overall operations. The long chain of associations between the naval architect and the execution in the final assembly, which required drawings, technical instructions, components, and materials, was said to be the

> hurdle. The Exodus 45 yacht project had shown itself to be a successful example, and provided the experience of solving the hurdle for that part of the business operation of the firm.

The *product* occurred in the story as yachts in general and as various sizes of yachts like Formula 2 yacht, Exodus 45 yacht, Exodus 40 yacht, and Exodus 60 yacht. The product was also labeled according to the various characteristics or concepts of the product: the serial production yacht, simple yacht, cheap yacht, entry–level yacht, production–efficiency–optimized yacht, pure racing yacht, third–party–built yacht, advanced yacht, uniform yacht, furnished, one–design yacht, one–design concept, established class, extreme product, and the pilot yacht that initiated a restructuring of the firm. This long list highlights the vast number of associations connected to the product. The product is again addressed in terms of the technology or the components of the whole, like engineering, materials such as wood and fiberglass, and product techniques. Again, there are numerous *actors* in the story. The key activists are former managing director Luca Reynolds and current managing director Schon Mitchell, naval architect George Beaver, company owner Leroy Fredman, marketing director Ernest Young as the initiator, technical director Keith East, business division director Teo Todd, and project manager Ouden West. The stable team of skilled carpenters and professionals like draftspeople and yacht builders also played a vital role. The case and the story makes further reference to agents, to customer RL, to racing– or cruising–oriented personalities, to yachtspeople who are personalities and experienced with yachts, to an exclusive club of people around the project, and to affiliates named as loyal friends of the firm. The *invention* is introduced as the origin of ideas, like statements in which the customer is said to be the main source of innovation; the new customer thinking; and the gap between yacht–measuring principles and practice, which highlights the readiness and potential for something new. The ideas also stem from the company's own requirements of uniqueness, superiority,

reliability, simplicity, beauty, or whatever makes the product as good as possible, understanding that the customer pays for it all. The deliverables of invention are stated as an idea on paper, discontinued ideas, next development cases, the company's own solutions, customers' ideas and customization, and product improvements. Deliverables also occur in such forms as drawings, building instructions, documentation, final specifications, and a prototype. A particular deliverable is a business model, which is viewed like an industrial concept. The methods for bringing about those deliverables are said to be securing access to the best know–how and experience, combining yachting performance attributes with the good feeling of sailing, design briefs, technical calculations, experimentation, and the testing of deliverables. At the interception of the firm, an innovation was using the mold itself to speed up and replicate products. The triggers of the decision–making process were seen as a desire to think differently about the yacht, an awareness of an unmet need, and a pushing initiative. The emotional aspect occurs in the form of encouragement, adverse attitudes, because of past feelings of freedom of choice, as a strong belief in their own ideas, and as a willingness to contribute. The dialogue is characterized as discussions, cooperation, talks with the customer, influence over others in the form of building relationships, taking the ideas of others into account, arguments among salespeople, and imposing their own agendas. The decision itself is shallowly addressed, but is spoken of in terms of mutual concern and understanding. The story is associated with *conditions* of innovation in the firm in numerous ways. Above all, the yachts were of sufficient quality to hold up under ocean conditions. The story tells about the organizational setting in which the firm operates, with the long chain of contributors engaged in the delivery of the yacht. From this follows the organizational debate about in–house versus contracting, the discussion about network of partners, the talks about the design with is said to be outsourced and still organizationally very integrated, and elaboration about organizing assembly as 'an engine' ruling the entire process from order to delivery. As the outsourced

design was the fundamental and leading organizational idea, the rest of the production was adapted to that decision. The organization relying on external designers rests on a strategy of investing in customer dialogue and a documentation strategy of guaranteeing quality. The diversity of operations also mirrors an awareness of and debate over the firm's self–perception in the story. The ethos of the firm is mentioned as a supplier of fast and beautiful yachts, innovation in combining parts of the yacht and guaranteeing quality, a coordinator and integrator of competencies, a flexible yacht assembling firm, and, simultaneously, a firm building yachts from the start to finish. The innovation case studied was temporarily organized in a separate business offering the venture and the firm's own environment and its own priorities. Finally, the story also highlights the debate of the location and powers of the firm in the initiation of new ideas and as a tension between the owner's office in southern Europe and the domestic yard.

The major shortcomings and *barriers* in the case (Appendix F4) are that despite the high priority of new product development, or perhaps partly because of it, the firm has not had a satisfactory level of profitability. On the technical side, product faults occurred as a problem, but they were still seen as normal when pioneering into the unknown domains. Having the end user deeply involved in the development also introduced an element of foolhardiness in trying new ideas that had no proven solutions. Considering how extreme both the product and the production process were for the case project, the administrative shortcoming was inadequate testing procedures. Indirectly, the hyperactive tempo of the company launching new development projects appears to be the origin for many of the problems. The constraint of lack of time was explained partly by the strained work situation of numerous yacht deliveries along with a good order book situation and by the many simultaneous new and ongoing projects, but partly because of shortcomings in managerial practices and skills. The managing director said, for instance, that the project manager's work and role concept 'never flew here'.

This firm is exceptionally strong both on new product deliverables and active persons engaged in roles. *Product innovation theory* was visible as an industrial concept at the start, as were innovative applications of proven solutions, one–design concept, and organizational innovation. The case refers to the *theory of dominant design*s, in which it is suggested that being the first with a technical innovation does not guarantee success; that has been the thinking of the company's management. There are several traces of the *theory of promotors* in the case. The product innovations have the quality of being new to the firm as well as being new to the market. There is no evidence in this case of innovations that are new to the world. Former managing director Luca Reynolds had the role of deciding the organization structure and assigning resources, as well as promoting the idea and the structure of the One–Design Division venture. His experience in the business gave him an appreciation for this idea. He could be named the Promotor by Power in this case. Naval architect George Beaver shows clear signs of being the Promotor by Know–how; he is the master of the yacht technology and a legend in yacht design. Technical director Keith East also shows signs of being Promotor by Know–how and a Process Promotor; 'I am contributing by overseeing the process, coordination of the total, and, in particular, the first end [early phase of the R&D process] to have those who build the yacht briefed and equipped to do good work. In the end, there are few people who grasp the project from beginning to the end'. The production manager played a similar role in the firm: 'Builders come to me asking how should this be solved, as I have been engaged in and have had experience building yachts for so long'. Division director Teo Todd represents another mix of Promotors; in building the factory and the network of cooperation partners supplying components, he plays the role of reproducing the industrial concept in a new way and deciding the organization and terms of cooperation, while unifying the numerous people in the many organizations participating in the network building the Exodus 45 yacht. Hence his role has dimensions of both a Relationship Promotor and a Power Promotor. Marketing director Ernest Young plays

a role with reference to the profile of a Promotor by Know–how, as he is driving the development and formulation of the design brief. The case also demonstrates a clear view how the situation created new propensities according to the theory of *situation and environment*, in conjunction with the *knowledge creation theory* and *theory of strategy*. The one–design idea had been on the table some thirty years earlier, but did not succeed at the time. Now the breaking of measurement rules on the racing arena had reached a point at which the racers could consider the one–design solution. At this point the vision of restoring the firm's image of a performance yacht builder also emerged. As technical director Keith Young said: 'All this having to do with racing is positive; it creates interest and strengthens our performance value. If you think of what the yachts are appreciated for today, they are much more likely to be performance yachts than they were 10 years ago, and not merely beautiful yachts'. The case reflects the presence of the *theory of deliberate or emergent strategy*. The going from 'merely a beautiful yacht', to a 'performance and beautiful yacht' was not a straightforward path of developing the one–design yacht Exodus 45; the diverse interpretation of what was to be the right naming of the yacht project examined shows evidence of a long process of reiterating the idea. Each iteration had the characteristics of the *knowledge creation theory*. The numerous expressions are evidence of the evolving new knowledge of what the innovative project was supposed to deliver in the end; the conceptions started from an 'serial production yacht' and ended as a 'one–design yacht'. The success of the one–design concept relied partly on an earlier related but discontinued project, which is evidence of the relevance of the *theory of prior knowledge*. The shaping of the new business division is connected to the *theory of the business model*. To quote technical director Keith East: 'I would say that the biggest impact of the Exodus 45 yacht project was on the industrial concept of the firm, despite the technological sophistication of the yacht. More and more, and that is how it works today, the assembly is the engine and all the rest adapt accordingly. It means we call in resources when needed, when we have the network that we work with'. The presence of

the theory of *company culture* is apparent when considering the statement that the firm has always continued to develop new things, whether it could afford it or not. It also reflects connections to *the theory of values*. The *theory of formal and informal organization* is apparent in the statement that the formal project management aspirations had not succeeded, where the tight network of relations had prevailed regardless of the organization chart. The informal behavior of the organization, in connection with the several authorities in different locations of the organization indicates that there are trace connections to the *theory of mechanical and organic management systems*. According to the theory of the generic strategy of the firm, the orientation is primarily striving for product excellence, as indicated by the saying that Adventurer's mission is to make a boat as good as it is possible for the company to make. However, there are also visible indications of striving for customer excellence orientation, seen in the saying that the customer is the main source of innovation. As the company can evidently balance these two factors, it is a likely signal of the presence of the *theory of sequential attention* to problems.

In summary, the story connects back to the theories presented in Part 2: Theories. The story may be described by the following theoretical aspects; product innovation theory, the theory of dominant designs, the theory of promotors, the theory of emergent or deliberate strategy, the theory of knowledge creation, the theory of prior knowledge, the theory of the business model, the theories of company cultures and values, the theory of formal and informal organizations, the theory of mechanistic and organic systems of management, the theory of the situation, the theory of sequential attention, and the theory of decision making.

5.5.5 The Humanist Case Story

In the Humanist case, the majority of local managers had been recently recruited. The organization suffered from a lack of launches, yet the sales growth was 20%—which demonstrates that product renewal is not the

only way to grow a business. Striking in this case is the fact that the discussion does shallowly address only a few new product initiatives. The new product initiatives, as perceived by the Humanist interviewees, were worked with under conditions which were by and large given. The agreed–upon starting point for the discussion in case Humanist was the L–shaped wood furniture designs of the firm. However, it proved to be a useless approach, because few members of the staff had any experience connected to that knowledge. Perhaps because the organization lacked a common successful experience delivering novelties, it was difficult to come to grips with innovation success in this case. The complications described after the story may provide a different perspective in this book: the absent track record of innovations.

> The current sales of the firm, founded in the 1930s, still rely primarily on designs of the early days of the firm. The ownership of the firm had remained the same for over a decade, but top management had changed many times during that period. At present, the CEO and the management team of the firm were newly appointed and the new managing director Margot Bergh and the management arrived at an organization in a stagnated and disillusioned state. The situation was described by former chief designer Bart Shooter, who had recently retired as a member of the board: during the recession, the ownership changed, followed by a change of the CEO, which brought in the consultants, and rationalization plans were launched. When the plan failed, the CEO was replaced. This happened several times, introducing unrest and fear. People become cynical—'Let's see how long this lasts'—and a wait–and–see culture became rooted. 'Too much energy was wasted on reorganization, as everything eventually returned to the status quo' The pride of working for the firm was eroded, along with the engagement and support of the new owners: 'If they came, they stayed for an hour, and the disappeared'. The new owner—despite his distinct interest in the arts and his substantial financial resources—was not as interested in and enthusiastic about the daily work and

deliverables of the firm as the previous owners were. The managing director said, 'The turnover was 75% international and the rest domestic. Now it is the opposite. You can see it everywhere; systems are only in the domestic language, people nowadays speak few other languages. We became a local firm'. Or, as one newcomer put it, 'I think this firm has been in sleepy mode—just sitting back and receiving orders. Now it's changing into a more dynamic state, in which it sells and goes forward'. That statement reflects the fact that the firm currently experiences a 20% volume growth, explained by public attention to the new (potential) renaissance of the firm. To quote managing director Margot Bergh, 'We grow because of a dialogue; what sells—the old products, yes—but ideology sells. What I do is to translate into contemporary language what has been done before. I've gone to the roots, trying to sell the notion of living space'.

The people at the top of the firm, however, were articulating that the current line of action was not sustainable. As the managing director said: 'We're buying time. When we don't have anything to show, we talk about arts cultures and the context of community. You have surely not noticed any big product launches?!' Some attempts had been made to break the silence on the topic of marketing of major product launches. The story was primarily the one conveyed by the managing director. There was one attempt to attend an annual exhibition, but the new products were disqualified because they were found to be too technically fragile. An attempt to buy designs and produce the products by contract manufacturing in Asia had failed. It was decided that improved products would be exposed later at the firm's anniversary, but they did not materialize. Then the involvement of domestic designer Hans and designer Eric joining the firm was made public and raised expectations. The upcoming exhibitions in Milan were taken as a milestone for a new coming. The Milan deliverable was a buildup for the internal cooperation. Designer Eric and designer Hans had the initiative to propose, and they cooperated with chief designer Jim Fix and CEO and chair of the board Dick Cayard. The briefing did not work, and there was miscommunication among the participants regarding the new design; time was lost

and the process was started anew. Because of that incidence, it was argued, no design stood out, and it was decided to present several demos. The pragmatic solution was not to present new products, but to present the design process—like a laboratory of designers. To make the presentation look like a concept, the whole range of products was painted white. Managing director Margot Bergh had vetoed launch proposals twice, but finally gave in. Unfortunately, the launch was deeply regretted, as its reception was not good. The audience saw only a technically incomplete product; nobody paid attention to the laboratory idea and the process. The firm came to show prototypes, but the audience expected to see complete products and based their judgments on product criteria. Loyal people of the firm expressed disappointment, and the entire effort was considered domestically to be below the firm's standards, although it was appreciated internationally. Again, as the managing director said, top management had tried to buy time.

The management of the process had failed, and would have completely collapsed if it had not been for sales manager Kaj Swan, who was the guru of the product category. The firm had a similar experience with a later case aimed at the exhibition in Stockholm. In the early preparation for the Stockholm exhibition, chief designer Jim Fix did not have any proposals to show. He was known as a last minute doer. When managing director Margot Bergh lost her patience, a quick decision was made to paint the existing products black and present them as a contemporary design, replicating the earlier decision for white designs. On top of that, a spectacular presentation was built. The act worked as a coverup, as the product developed was semi–finished. As the managing director put it: 'And, again, I did buy time. I really can't do this many times'.

From these experiences, the firm gained the conviction that somebody needed to be hired to control the process of delivering new products. Consequently, a UK branch of the firm called the Studio, was strengthened by the hiring of manager Igor Bold, who had ten years' experience from a similar job in the industry. He made an effort to know the firm, and worked diligently

to become accepted among the employees and appreciated in the cooperation of the organization. At the time of interview, the plan was to build a stage–gate model for administrating the product development process. The firm paid a monthly fee for Studio's services. The process had not yet provided any experience, which caused frustration. The setting was advocated by chair of the board Dick Cayard, as a synergy organization structure. Managing director Margot Bergh had an alternative organization in mind, however: merging Studio in UK with Humanist and thereby strengthening the organization.

The organizational environment of the activists was complex at Humanist. Not only was the management new, the managing director Margot Bergh was regarded by her subordinates as a strong opinion builder, decisive, active, and extroverted. Chair of the board Dick Cayard had a background in international consulting, and was described by the management of Humanist as 'consuming'. Chief designer Jim Fix had been in his position for some five years and was regarded internationally as a designer worthy of merit. He was described as 'an outsourcing guy', replicating ideas and buying them from Asia. He was promoted by chair of the board Dick Cayard. Chief designer Jim Fix acted in the autonomous firm Studio in UK, which was staffed with half a dozen assistants—junior resources and newly recruited manager Igor Bold, who was in charge of the process of developing products. The chief designer acted in dual roles, both as a supplier of designs to the firm and as a minority owner of the firm. The firm was under a holding company headed by chief executive Charles Azema in Scandinavia and owned by Joe Cutter, who was known for successful large ventures in the business world. It appeared, however, that the power of the owner was assigned to chair of the board Dick Cayard. There were insinuations that the chair of the board was a bad influence on chief designer Jim Fix. There were discreet opinions about Jim Fix not having a general conception or a thought about the future destination of the firm. The lack of the big picture was consequently said to prevent a synthesis needed to introduce the proper future product range of the firm. Beyond Studio, the firm was also staffed with experienced designers Hans

and Eric. Designer Hans, designer Eric, and chief designer Jim Fix appeared to have vastly different ways of working with design.

Internal cooperation was at an early stage at the time of the study, because of limited mutual experience, the diverse background of the activists, and the dispersed geographical offices. Furthermore, most of the activists were regarded as high–caliber personalities, putting pressure on the communication between the activists. The international organization also appeared to be relatively distanced from the domestic firm. It reflected low recognition of a long–time manufacturing partner, which, in several instances, was being spoken of as one supplier among many. Product manager Kim Bergh, who was close to the daily processes, regarded the relationship with the manufacturing partner as vital. The firm did not have any production organization of its own. Cultural differences between the Scandinavian firm, the domestic firm, and the UK office were discussed, particularly when there was difficulty understanding the ethos of the firm. Product manager Kim Bergh formulated the ethos: 'I do not call the firm a brand; it is an institution. The firm has more of a commercialized ideology'. Managing director Margot Bergh referred to an example in which the firm was offering for a hotel chain; 'The UK product development has not yet grasped the ideology of the firm. Or they have seen the ideology, like in the hotel case "Nordic common sense" and have bought the thinking, because thinking is a prerequisite of understanding, but they *do not* yet understand'. The UK office was handling the situation without regard for the firm's ideology. In short, the interpretation of the firm's ideology by the UK office did not work. On a level lower than the national culture, there were community cultural constraints. It was seen as internal miscommunication: 'It is the *core business* of the firm to do living spaces, *not merely* pieces of products'. However, chief designer Jim Fix and chair of the board Dick Cayard had not adopted the new idea: 'Jim and Dick came to the table more to develop individual articles, not spaces', said the managing director. The local organization had recognized the efforts made by the UK office to reduce the distance and language gaps. Furthermore, there was at least one obstacle: the absence of structures and practises.

The Humanist strategy was not explicit, and had not been documented. As the managing director put it, 'We do *not* have a *strategy* in this firm yet, a true future strategy. Last year at this time I said, I'm not yet able do it because I don't have good sense of this house'. The firm did not have a groundbreaking track record of any 'living space' project, mostly because the resources of the organization were not equipped for such undertakings. As the idea was founded on the legacy of the firm, it also assumed an historical organization, which the firm did not have. What the firm was said to have was a UK–driven product development, which it did not deliver. It was supposed to provide an 'international view' through its contacts, which was rightly perceived to substitute the contacts of Simon Storm, the grand old man of the past, and complement the domestic legacy organization.

Besides the hurdle of the relationship with Studio and product development, the domestic organization faced its own operational challenges. The firm did not yet have an official management team, but worked as a team on an ad hoc basis—an introductory arrangement for a year because the managers were all new to the firm. As managing director Margot Bergh pointed out, the firm's managers had yet to participate in discussions about firm strategy and consequently did not yet understand the politics among Humanist, Studio, and the holding company. The primary concerns of the domestic firm were to respond and deliver to the increased demand, increased volumes, rebuilding routines, reporting systems, and retail activities. There were expectations for development of the products, as the product range was said to be incomplete for international markets.

Overall, the activists reckoned that the organization was in a transition phase between the past and the bright times to come—only if the structural barriers were to fall. Those constraints particularly concerned communication and teamwork, the location and competence of the design office, the premises for experimental activity, and the creation of new products and management of the product development process. To quote Igor Bold: 'It has taken longer than I believed we would need to get

> this going. That's why the products were completed at the launch. The organization has not been used for the entire production'.

The story is about p*roducts*, which are referred to a range of products, new designs, old products, disqualified new products, and complete products. In more specific terms, the product is referred to as furniture: white furniture or black furniture, or even more specifically, by the technical structures of the product. However, on the general level, the product of the firm is also attributed to a living space. The *actors* in the story who were foremost in invention were the newly appointed managing director Margot Bergh; chief designer and minority owner Jim Fix in UK; domestic designer Hans; domestic designer Eric; Humanist's chair of the board Dick Cayard, who had a consultancy background; sales manager Kaj Swan, who is also known as a chair guru; and product manager Kim Bergh. Logistics manger Igor Bold, in charge of the R&D process, had just joined the firm. The chair of the holding company Charles Azema and members of the board were present in the talks, but remained at a distance from the active work. Also at a distance were loyal friends of the firm. People present in the talks but no longer in the business were mentioned: the previous owners, retired grand old man Simon Storm, former chief designer Bart Shooter, and the consultants. The management team was mentioned, but it also appears to be peripheral to the matters studied in this book. The *invention* in the story tells about prototypes, demos, new designs, product improvements, and a spectacular presentation. The Humanist story tells about ways of introducing ideas in terms of criteria, briefings, buying and replicating of designs, a laboratory of ideas, experimentation, and many attempts. Despite all, the story also tells about the absence of genuine news. The *decision making* in the narrative talks about triggering thinking, an international view, initiative, and proposals. It also raises the issue of emotions—emotions like pride, enthusiasm, and interest, but also unrest, frustration, disappointment, lost patience, regret, and cynicism. Part of the story introduced the decisions that had been addressed: on one hand

engagement, involvement, cooperation, talking, and dialogue; on the other hand, work for gaining appreciation, personal contacts, common language, support, and interpretation. A negative view of the aspect of dialogue is introduced as a bad influence over somebody. The decision at the end is addressed in terms of understanding and conceding. The *conditions* of innovation in Humanist were reflected in a transition between the near past and the present. The past is a description of stagnation, rationalization, and old reorganizations, of disillusion, a sleepy mode and status quo. The past is present in the situation, which at the same time bears signs of a turnaround of 20% volume growth, as there are concerns of ability to respond operationally as there are constrains of limiting past practices. The 'buying time' to rebuild the R&D is a sign of the situation. The transitional situation mirrors issues with the legacy culture and the current ethos of the firm. The legacy culture was introduced as an ideology of the firm—more specifically, as an ideology of arts and culture and simultaneously a culture of wait and see. Because of the organizational structure, there were cultural differences between the parts of the organization that were also discussed. The consulting background of top management was introduced as an influence in the present organization culture. There were several dissimilar conceptions of the current ethos of the firm. Humanist is spoken of as a publicly recognized institution, an expected new–wave firm, a firm with a grace, a furniture company, and a firm specializing in living space. The organizational structure appears in the story as a holding company, a domestic and a UK branch (Studio), completely outsourced production, characterized as a synergistic organization building on intra–organizational cooperation. Product development is said to be UK–driven, and it was mentioned that the organization was lagging behind the present and future aims of the firm. The future strategy and direction was spoken of in the story as a weak conception of the future firm, ad hoc strategy, organizational autonomy, and politics.

What are *the barriers,* and what went wrong behind the story (Appendix F5) The firm's managers unanimously agreed that there had

not been any vital new product launches from the firm in recent years. There are several merited professionals present for innovation, but those persons may not have joined forces. The people at the top do not play well together, and the setting is controversial. There were several instances of broken dialogue and people not working well together. There were voices apparently longing for actors who had passed away. The situation seems to have created a duality, with respect to ideals and to the question of the best organizational structure. Even managers pointed out that they lacked managerial resources for delivering conventional product development and complained about the lack of adequate resources to address the CEO's courageous idea. That fact may hinge partly on the statement that the firm has no collective vision of the future or a mutually accepted strategy. It follows that the organizational structure makes innovation complicated, particularly when the organization works under pressure to respond to and deliver a 20% increase in volume.

This firm was unable to deliver innovations, which separates it from the previous four organizations studied. The theoretical connections therefore aim to explain what is against innovation and what is in favor of it. One suggestion is that Humanist faced problems connected to the *theory of disruptive technologies*. Indications are that the majority of product ranges are the designs by the original chief architect, and that new products were not able to cannibalize on the core products. There was talk about a new product dimension in connection with the *product innovation theory*; but it was only talk. There were numerous actors who could have potentially contributed, according to the *theory of promotors*. Chief designer Jim Fix and one or both of the domestic designers could have the characteristics of an Expert Promotor. Managing director Margot Bergh could be a Power Promotor. Logistics manger Igor Bold, product manager Kim Bergh, or sales manager Kaj Swan could play the role of Process Promotor. However, the role play does not work. A reason for the lack of unity is the short tenure of most of these key players, which may reflect traces leading to the *theory of authority*. From this issue probably follows the tenuous connections

based on experience between the players, which may connect to the *theory of prior knowledge*. For the Promoter role play to work requires mutual appreciation and respect for each other as individuals and professionals. The absence of the roles may be explained by the *theory of equilibrium*: the willingness to contribute. There is also evidence of poor teamwork, even broken dialogue among these players, which may be why people and issues could not come together. Probably this highlights the role of *the theory of values.* This observation may also connect the case to *the theory of decision making* and *the theory of goals.* The teamwork can be partly explained by the ambiguity about who actually is the Power Promotor, as there is a multilevel and complex organizational hierarchy—despite the fact that the number of employees is small. The absence of a distinct authorized leader may be the cause (or the effect!) of the lack of direction and of a unanimous interpretation of the ethos of the firm. As managing director Margot Bergh said, 'We do not have a company strategy, a true future strategy', which highlights the *role of the theory of strategy*. At the same time, the organization appeared to have been stuck in old routines. According to the *theory of the formal and informal organization,* the formal is the dominant mode from which it is difficult to break free—a situation that occurs in the Humanist case. To quote logistics manager Igor Bold, who was in charge of organizing the product development process: 'It has taken longer than I expected to get product development process up and running. That is why it is still not working. This organization has not been used to do the whole process'.

However, there are not only adverse forces in the story. A constructive factor is that dynamic new management, which is not burdened by procedures from the past. Hence, the *theory of mechanistic and organic systems of management* can potentially have a predictive value in this case. Another constructive, evidently also frustrating, learning process is visible. The iterative course of events was indicative of the relevance of the *knowledge creation theory*. There were also signs of optimism in the assessment of the environment and the situation in which the business stood. As managing

director Margot Bergh said: 'The timing is perfect, seen through society, sociological, and socio–cultural changes around us; there is not a better timing for the launch of the firm. I have never been this sure about this firm, it will be an incredible success. I only need people here'. The case demonstrates therefore, that the *theory of the environment and situation* alone is not enough, but requires a proper conclusion about how to respond to the favorable situation that the environment offers successfully—which was apparently lacking in this firm. The longstanding complex duality apparently demonstrates adverse connections with the *theory of company culture*.

In summary, this analysis proposes that the story connects back to the theories presented in Part 2: Theories. The story may be described by the following theoretical aspects: barriers related to the theory of disruptive theory, the theory of innovations, the theory of authority, the theory of prior knowledge, the theory of company culture and values, the theory of decision making and theory of goals, the theory of strategy, and the theory formal and informal organizations. The positive side of the story connects to the *theory of mechanistic and organic systems of management,* which appears not to be part of the problem. There was also evidence of the presence of the *knowledge creation theory*; only there has been too short a time for iterations of the new management. The firm is fortunate to have signs connected to the willingness to contribute, or *the theory of equilibrium*. Finally, there is also a positive sign of the presence of the *theory of the situation*.

5.5.6 The Player Case Story

The Player case story focused on a story about a technological playground. In the past, the firm had launched into the market new products with innovative functions and designs, but also with inventive operations concepts like modular products and customer relations management. During the half decade prior to this study, the firm had not been successful

in launching new products, despite may efforts. The achievements had been primarily on minor product improvements. The case is an example of a company's change in management and innovation as it moved from an organization with the entrepreneurial regime to an organization with professional managers in charge.

> Commitment to the TechGear project had been very strong, even though variations had occurred. At times, when large problems were faced, there were questions about whether or not the project would ever amount to anything. Nevertheless, solving problems did not silence thoughts in the organization that the projects generally drag on for too long, that the firm had too many ongoing projects, or that the TechGear project had lasted for three costly years. The role of the top managers and owners proved to be vital to instill belief in the undertaking.
>
> By the early 1990s, the idea of putting electronics into the playground products had already appeared. The idea of founder and chair of the board Andrew Illman was to integrate the chip into the products in order to raise the cubic meter price. Project manager Jonathan Sanders had also adopted the 'chip idea' when he was initially briefed. Terminology and conception somewhat confused the issue. Acting managing director Joe Slocum declared that since 2001 his direction had been that the venture was to create a meeting place for three generations, and that goal still applied. He defined the concept as 'a play–like and interactive environment for adults and grandparents playing with their children and grandchildren'. The basis for his simplified guidelines, he argued, was based on evidence of customer needs, market changes, and a non–technological perspective, as he was not familiar with technical matters. The interpretation of commercial director Tim Upman was, 'When the TechGear project was started, the objective was to create an intelligent learning environment and a meeting place for three generations'. The documented thinking was, more specifically, that the preschool syllabus could be undertaken completely on the playground.

Furthermore, it could be a place where elderly people could feel at home, exercising without embarrassment in the play garden.

There was disagreement and conflict of interest between the technological view [the chip] and the value creation view [the learning and the meeting point] among the activists. The former group was concerned that if the technology were not connected to the product, the entire idea would be lost. The latter group said that the chip idea distracted those involved in the project, further emphasized the playground as a learning environment, and questioned the need for the technology. Some introduced the issue of confusion about the terminology, and expected a uniform language in order for the activist groups to understand each other. In some minor cases, the confusion was about some activists claiming that the project introduced new technology, whereas it was more specifically about using existing standards. In some other cases, the confusion was about unsettled meanings like what the 'three generation meeting point' actually meant. However, both sides of the debate agreed upon the idea of an 'intelligent playground', which materialized as the computers, the play–creating software, and the links, which had not been possible without the information technology.

There was a deliberate strategy to introduce new thinking through research and investigation. The idea received funding from the government technology fund and brought university people into the picture, doing research. The ideas of motoric learning in schools and children playing with the elderly in kindergartens were investigated, among other things. The project became an umbrella for a number of dissertations, with the aim of bringing in different perspectives and *scientific research* to the product. The firm had also used a scenario for investigating the views of the decision makers in educational institutions, municipals, and ministries. They, too, invested in the development and growth of children, and common ground was therefore sought. Practical experiments were also undertaken. It was seen as important evidence when presenting a new application and seeing 20 children in queue wanting

to play with the creation. As Jonathan Sanders said, 'Then you can see with your own eyes what works and what doesn't work. One idea out of one hundred proves to be right'.

The TechGear project was exceptional in the firm, when it was 'extensively built on facts', as managing director Joe Slocum explicitly put it. The project manager commented that that part of the research work was pretty much beside the point, but the firm used the results to demonstrate the impact of new product ideas and to influence decision makers and customers. Activists agreed that drafting new product ideas based on the research had not been easy. It was recognized that as the actual environment–to–be was unsettled, the results of the application testing, investigations, and research were somewhat unreliable.

Another fundamental point of departure for the TechGear project was the thinking in connection to the choice of structural material used in the TechGear product. The TechGear product range was envisioned as the future product range of the firm, touching upon the fundamentals of the firm. As managing director Joe Slocum put it, 'We have had this very raw–material–based discussion: Do we stick to wood, or do we substitute it with metal in our products? It has been very emotional. In a way, you can understand it; it's a hot issue, because the location of the firm is based on the idea of the local wood resources'.

At the initiation of the project, it was decided that wood would be the main building material of the TechGear products. The idea of metal as a material was introduced as distinctive design feature of the product, however, and design features were a vital part of the product–to–be. Metal was associated with urban areas, and was seen to be better than wood. Some of the competitors had refocused from wood to metal products, which made the firm uneasy with its original decision. However, switching was not easy. Would the arguments for the main product range of the firm be undermined? Would it make the firm lose its distinction on the market, if it shifted from wood to metal? Consequently, the wood or metal debate complicated the formulation of the concept. A major contradiction appears in this discussion, as much

time was spent on the issue, yet there is little wood in the Smart product at its current stage. As the project manager said, 'It has been difficult to state the physical product, when the technology issue has been open and there is not a concrete view of customer need and what we should be doing; great indecisiveness prevails on this question'. The project manager had made a further observation about how the wood discussion was preoccupying and limiting the thinking in the firm: 'It is discussed a lot what will be in and out. From what concept will the future products and product portfolio evolve?' In the TechGear product, there were not many wood components in the first place. As sales director Tim Upman said, 'It's the technology thing, with the computer poles, the computer games, and the application tools. Those things aren't spoken about much internally. Why not? Because of history. The firm has made physical products for so long'.

The choices regarding the product also connected the discussion back to the environment for which the future product should be developed. Applications had been made primarily for schools. The school world was known to change slowly and to be conservative, and there was high reliance on the teachers' willingness to contribute. However, attention also focused on geographical considerations. Assembling local distribution in countries like Croatia, Spain, and France; placing installations of local units; building a training organization and training users; arranging maintenance when the product did not work—none of these things had yet been experienced. The concern was causing ambiguity over what business model should be used at the end of the day. Licensing to the USA had also been considered, but distrust among the activists that the technology did not work properly silenced the idea. The cultural differences between countries were raised over the idea of a three–generation meeting place. Chinese adults do not want to pass on certain traditions to their children, for instance, and a middle–aged man alone in a playground in UK creates negative associations of deviant sexual behavior. There were too many unknown circumstances in different parts of the world, which was why the project manager spoke in favor of beginning with a more restricted

and controlled geographical area, in order to approach the environment more strongly and deeply. Indecision prevailed.

For a long time, no one in particular was assigned the undertaking. Founder and chair Andrew Illman had the idea, but it was treated as a responsibility in line with the formal organization and duties. Then administrative director Jonathan Sanders was nominated project manager, in addition to his line responsibilities, because he questioned the unorganized state of affairs and because he was knowledgable in information technology. He reported to managing director Joe Slocum. The unorganized state also meant that resources were initially assigned on a temporary basis, and only later were people were hired permanently. The project manager acted within the formal organization primarily through marketing coordinator Heidi Huber, area sales director Arthur Niederman, and R&D manager John Sinclair. The founder and chair was said to be in and out of the discussions from time to time. Beyond the internal resources, there was a vital cooperation with the local university. In particular, a professor of design Nicolas Smith and the researcher Rainer Westman (who later joined the firm and succeeded the acting project manager) were permanently involved. Furthermore, there were a half dozen doctoral students under the supervision of the design professor, who supported the TechGear project throughout their studies.

The project had a monitoring group consisting of the firm's management team and some additional managers who were members of the owner's family. This group of ten sought consensus in choosing the designs that represented many proposals. The project manager questioned the efficiency of the group based upon too many participants who were engaged in too many things. Consequently, the group did not make actual decisions, but merely produced guidelines that chiefly aired the strong opinions of managing director Joe Slocum and founder Andrew Illman. As one cynical participant said, 'Well, it is purely a meeting of founder Joe and CEO Andrew. The two of them debate with each other, and the rest of us listen.

Addressing anything to them is like shouting to a wall'.

The firm had a marketing task force that was responsible for the product portfolio. Concerns were raised in several instances that people found it difficult to know in which meetings which matters were decided, where the decisions were supposed to be made, and where, if anywhere, decisions had been made. Furthermore, the participants were said to be the same in all forums, but with different agendas.

The TechGear project had not confirmed its status on the market at the time of the interviews ten years after the birth of the idea. Several people discretely expressed doubt about the Player's inability to deliver innovations. Reference was made in several instances to earlier cases, in which the most cynical labeled the initiatives as 'brand–building projects without business significance'. Opponents pointed to the high cost of the product, which was seen as being difficult to justify, and at the limitations of the sector of customers who could afford the TechGear product. This group wanted the cost of the product to be reduced. The optimistic activists argued that price was not truly the issue—that sharpening the idea was the important point. These forces wanted to step into the environment to gain new experience. They talked about a pilot environment—a local school where prototype products would be installed for authentic use by children on the playground. They urged their colleagues to consider genuine references and 'a kick from the market'. At the time, they said, there was only a personal hunch about where to take the TechGear project next. They believed that such an approach would allow the TechGear project to begin generating a positive cash flow during 'the coming year'. The pilot environment would as well be the first actual references building up the understanding what sector of business the TechGear project actually is about.

With the TechGear project, the firm perceived that it had gone far outside the common turf of their ordinary business. They had encountered unfamiliar environments and an unfamiliar language. Consequently, what made the TechGear project particularly challenging was creating the

> definitions at the time it started. Not only had the definitions never been heard before; they had never been experienced. The project had created completely new products with unknown technology for the firm. This is a case of courageous venturing into the unknown, where rewards had not yet materialized.

In the Players story, the *product* is commonly referred to by its brand name, as applications, as a product range, as general playground products. However, the product also has an abstract meaning to people talking about, the games, the licenses, the product as a learning environment or a play garden, and future products. The most concrete counterpart is referred to in general engineering terms as technology, standard technology, and information technology; or in specific terms like components, computers, software, links, and materials like wood and metal. The central *actors* of the drama highlighted managing director Joe Slocum, founder and chair of the board Andrew Illman, project manager and financial director Jonathan Sanders, and sales directors Arthur Niederman and Tim Upman as the central activists. Others involved are R&D manager John Sinclair, marketing coordinator Heidi Huber, and unnamed industrial designers in the organization. Several of these people were members of the owner's family. The group was coordinated as a monitoring group, and in other forums that were said to be too large. The development force, albeit outside the firm, included university people like the design professor Nicolas Smith, researcher Rainer Westman, and doctoral students. Playschool teachers, children, parents, education officials, members of the civil service, and ministry officials appeared as vital references, yet not as activists of the development. The *invention* in the story originates from the idea of the microchip to be integrated into the playground equipment. The interpretation introduces several potential ends of the invention: an intelligent learning environment, an intelligent playground, and a meeting point for three generations. There were also several deliverables leading to that end: the initial brief, concept formulations, scenarios,

various designs, prototypes, and a pilot environment. The ways of inventing that were discussed relied and built upon facts like scientific research, investigations, and field experiments, in order to demonstrate impact and testing. The high frequency of attempts was mentioned in the saying that one in a hundred is right. The *decision making* is said to have been generated from customer needs, documented thinking, and revision of earlier decisions. Processing of the future decision was discussed and debated in internal discussions, in which people declared; advocated; envisioned; received feedback; listened; interpreted; distinguished perspectives and the agenda, and sought common ground, common language, meanings, and terminology. Adverse forces of the processing were also present, which was verified in discussions about disagreement, questioning, and distraction. As in the previous cases discussed in Part 5: Analysis, the decision making was emotionally loaded. Positive emotions and attitudes like optimism, personal hunches, willingness to contribute, and commitment were raised, as well as adverse emotions like unease, embarrassment, skepticism, and cynicism. The role of the owners was said to be vital in keeping the faith. Making the end decision is spoken of as a state of consensus, which is not easy to reach, however, and indecision prevails. The *preconditions* were addressed as an overarching industry reorientation and a changing industry. The project touches upon the deep ethos of Players, when the grounds for the firm's existence were addressed in terms of its location. The story included discussions about the company's strategic outline, business model, knowledge–creation strategy related to research, strategy to influence decision makers, and temporary resource strategy to respond to and address the change. The organizational consideration of the conditions generated talk of relying on the formal organization and a training organization. The three–generation meeting point and the play–like environment were neither anchored nor geographically located. The choice and decision were not made with regards to the target environment for which the equipment was designed. The location, such as the urban location, again, was connected to talks about cultural

differences in tradition and habits in various countries. The heritage again connected the development to the firm history and culture, as exemplified in the saying that the firm has usually been about physical products rather than non–material products. The situation was described as a state of unorganized affairs and indecision.

The two most central *barriers* in the Player case appear as the succession of founder Andrew Illman and the commercial delivery of the ideas. (Appendix F6). The idea existed in the talking stage for almost a decade, and the project had been in progress for some three to four years at the time of the study. No commercial product is yet on the market. At least one other new development referred to in the case was sold on the market as the Axiom product, which is not regarded as a commercial success by Player's management team. The new roles succeeding the former founder and current chair of the board, who is not operationally engaged, appears to associate with a whole set of consequences the effect of which is fatal for successful innovation. Despite the persons in the organization pointing at the founder as the problem, it cannot be excluded that the problem lies with those pointing at the founder. In other words, the temporal presence of the founder may, for instance, prevent the new roles from emerging. However, why did no one come to the table with new initiatives? Furthermore, the devotion of the CEO and the founder may have had different directions. Was the CEO actually striving for operational excellence and making the firm feasible for an IPO? And was the chair actually addicted to focusing only on new products? Perhaps the underdeveloped new roles explain why there were too many people around the table at meetings, why there were too many projects, why things did not reach a commercial stage, why new comers were shallowly introduced to the firm, and why project management practices were so shallow.

As indicated previously, the achievements of this case cannot be described in positive terms as successful innovations. The case had a strong connection to the *theory of company culture*, in particular to the *theory of cultural change* from an entrepreneurial to a managerial organization.

Consequently, the change triggered discussions that connect the emergence of the following new roles of *the promotor theory*. A distinctive observation was that any of the promotor roles were difficult to find. Managing director Joe Slocum had the power to act as a power promotor, which connects the discussion to *the theory of authority*. Informally, however, the ideas of the entrepreneur were competing with statements about the managing director, which is why the managing director probably did not enjoy respect in the discussion about innovations in the organization. Cultural change was also attributed to the organization as a collective, connecting to the *theory of the formal and informal organization*. One observation was that the policy was to run the innovation project primarily through the formal organization. This was seen as the absence of any particular project organization, which would have responded to the ad–hoc nature of the development project. Finally, the cultural change also addressed management structures, an issue raised in the *theory of mechanistic and organic systems of management*. The communication took place in numerous committees and in the company management team. Consequently, there was an overflow of information and matters to address when the issues were discussed in a mechanistic way and in a mechanistic organization environment and way, which connects the story to the *theory of decision making*. Another stream, which originates in the change from an entrepreneurial to a managerial firm, raised discussions about the choice of the firm's strategy, connecting the case to *the theory of strategy*. Conflict was event between the founder and chair of the board on the one hand and the managing director on the other, culminating in confusion about which generic strategy was actually running the firm. The managing director counted as successful product development the '400 product improvements', whereas the entrepreneur was complaining of a complete absence of innovations. The managing director was applying an operational excellence strategy and the founder was applying a product excellence strategy, creating conflicts of priority and lack of momentum in the firm. As the production manager said, 'Well, it is purely a meeting of

founder Joe and CEO Andrew. The two of them debate with each other, and the rest of us listen. Addressing anything to them is like shouting to a wall'. This statement again connects to the *theory of decision making*. But the dragging projects may also be traces of barriers in connection with the *theory of project management*. Irrespective of the change in leadership, the story also provides evidence of problems described by the *theory of disruptive technologies*. The theory may partly explain why the newly launched metallic product line has not gained recognition over the traditional wood product design. The phenomenon can be seen in the statement about the emotional wood–metal discussion and its connection to the location and faith of the entire firm. However, it is also present in the sales manager's statement about cannibalization: 'The competitors have shifted from wooden products to metallic products, and we believe the proportion of wooden products has diminished. I think we are afraid of this. What if we stick to wood? What happens when customers have 10 firms visiting them, nine selling metal and one wood'? Thus the case supports the connections to the *theories of company culture and values*. As the latest project had not yet come to the commercial stage, perhaps time will bring in the relevance of the *theory of the environment and the situation*.

In summary, this analysis proposes that the story connects back to the theories presented in Part 2: Theories. The story may be described mainly by the following aspects: the theory of disruptive technology, barriers related to the theory of authority, theories of cultural change and values, the theory of generic strategy, the theory of formal and informal organizations, the theory of mechanistic and organic systems of management, and the theory of project management.

Summary of the Analysis of Critical Elements and Barriers

In the discussions of the framed stories, the critical elements were the leading clue; they highlight the essence of the reality under which the firms and the activists work. The purpose of this study was to show up a fraction of the innovation phenomenon through a focused story in six firms, scoping the narrative with the five critical elements as the guiding trace. The analysis produced a record of key terms and conceptions of those interviewed, upon which the narrative was based. The narrative also yielded produced a record of those complications or barriers associated with the story. A condensed view is presented in Table 82 and the full view is presented in Appendix F. The analysis ended with an attempt to highlight evidence pointing at a connection between the story and theories introduced in Part 2: Theories. In Table 81 a summary of those vital theories which, according to this study, predicts success in the leadership of innovative mature firms.

The column 'Fields of theories' in Table 81 refers to the sections in Part 2: Theories. The topic is not an expression of one theory, therefore, but a field of theory. The two right–hand columns of Table 81 highlight the two firms that were found not to qualify as innovative firms. From this follows a noteworthy contrast between those firms that are innovative and those that are not. At the beginning of the discussions, managers from all the firms explicitly expressed their goal to be innovative. The final summary and further discussion about this result follows in the Part 6: Conclusions. An explanation for the difference between the innovative and the non–innovative firms may be partly a reflection of the complications or barriers found in the firm at the time of the study. Table 81 and Table 82 present structures highlighting the contrast between the innovative and the non–innovative firms.

	Field of Theory	Plumber	Gardener	Guardian	Adventurer	Humanist	Player
Product	*Level of innovation*	2	3	3	2	0	1
	Dominant designs	…	…	…	yes	…	…
	Business model	…	…	…	yes	…	…
	Waves of innovation	yes	yes	yes	yes	…	…
	Disruptive technology	…	…	…	…	no	no
Actor	*Promoters and authority*	yes	yes	yes	yes	no	no
Conditions	*Generic strategy*	yes	yes	yes	yes	no	no
	Emergent or deliberate strategy	yes	yes	yes	yes	…	yes
	Formal and informal organization	yes	yes	yes	yes	no	no
	Mechanistic and organic management	yes	yes	yes	yes	yes	no
	Company culture	yes	yes	yes	yes	no	no
	Values	yes	yes	yes	yes	no	yes
	Situation and environment	yes	yes	yes	yes	yes	…
	Organizational equilibrium	…	yes	…	…	yes	no
Invention	*Prior knowledge*	yes	yes	yes	yes	no	no
	Knowledge creation	yes	yes	yes	yes	yes	yes
Decision making	*Input*	yes	yes	yes	yes	yes	yes
	Choice	yes	yes	yes	yes	no	no
	Decision	yes	yes	yes	yes	no	no
	Sequential attention to problems	…	yes	…	yes	…	…

Table 81. Matrix of Theories Predicting Success in Leadership of Innovative Firms.

Table 82 presents a summary of all the complications or barriers in connection to the stories about innovations identified in each case. The corresponding comprehensive matrix for each case can be studied in Appendix F. The issues presented in the table rely both on my judgment as a researcher, having made the data categorization, and on the judgement of certain managers involved in the interviews in each case firm, with whom I discussed the findings after the analysis was completed. The field of complications and barriers, which has not been the particular focus of this study, is a much more complex issue than Table 76 would suggest. For one thing, what is a problem for one is an opportunity for another. Here the issue has been recorded if the matter is somehow in conflict or provides friction for the firm delivering the innovations. However, there is a longitudinal aspect as well. Here a distinction has been made among a matter of present concern, a concern from the past with effects on the present state of affairs, a concern from the past that is no longer a concern, or an issue seen to be a concern in the future. A general reading of Table 82 suggests that there are cases in which the problem has been made redundant, which is an indication of successful new knowledge creation and learning in the firm. Those firms struggling with innovations have fewer traces of problems defeated in their story, compared with those cases that appear to be delivering innovations successfully.

	Plumber	Gardener	Guardian	Adventurer	Player	Humanist
Actor	Grand Old Man succession change management style ○ Diversity of actors around same table ◎	Succession of the Grand Old Man will leave a gap ○	Failed 'electronic project' smoked out autonomous activists ◎	Indirectness of chief designer ● Inexperience of draftspeople ●	Founder & owner succession ● Driving forces missing ● 4 committees ●	Chief designer succession failed ⊙
Product	New electric feature alone not enough for a breakthrough ◎	First garden cutter without authorization masked as a technology project ◎	Premature electric locking system ◎	Less production–friendly yachts ●	Three new products insignificant ⊙ Expensive Mobile 2000 ⊙	Only 'classic' products ● Window–dressing novelties ●
Invention	Interpretation of Thatcher vision ◎ One–man solutions ●	As idea is shown, patience and time is lost for planning ●	Patent age of 20–year cycle only 10 years effective ●	70% complete solutions ● Time for 'design for manufacturing' ● Non–proven solutions ◎	300 'nuts and bolts' improvements ⊙ New technology playground ethos ●	Lack of completed deliveries ⊙
Decision	Belief fades when turnover lowers ◎	Informal dialogue with the board, embarrassing the US establishment ●	Failure of decision–making process ◎	Decision of three S601 simultaneous prototypes ⊙	Owner–MD arguing ● Ambiguity about who decides ● Owner passes the hierarchy secretly ●	Mis-understandings ⊙ Failing talks ⊙
Conditions	Italian glamor disconnected from sales ●	US head office culture driven by order and bonuses ● Employment locally ●	False vision of infrared technology ◎ Autonomy downside ⊙	Attitude of disbelief between MD and staff ●	MD operational improvement strategy ● Lack of project management ●	Disconnecting UK, Stockholm, Helsinki cultures ● Ethos clash and structure of the firm ●

○ will be ● present ⊙ past, still prevalent ◎ overcome

Table 82. Abstract Matrix of Frictions and Barriers for Innovation.

PART 6: CONCLUSIONS AND FINAL DISCUSSION

As the research of Chandy and Tellis (2000) has demonstrated, larger firms are not inferior to smaller firms in their delivery of innovations. Larger and more mature firms—like small firms—have their own set of limitations, but they also have their unique strengths and resources that support the Chandy and Tellis finding. The analyses conducted in this study and reported in Part 5: Analysis have revealed that innovation is an integral ingredient in the mature firm. Innovation is one concern among many of decision making and in the company's fields of daily activities. The implication is that innovation in successful mature firms is seen as an integral part of the general purpose of the innovative firm defined by management—not a separate issue. *The purpose of this study has been to investigate leadership in innovation, as a part of the overall leadership of mature consumer–product companies. More specifically, there has been an attempt to determine the areas that top managers attend to when sustaining the state and cycle of innovation, and the primary dependencies of those areas of leadership attention*. A qualitative research method was applied to the study of six firms with a track record of a series of consumer products new to the firm and new to the market. These conditions served as the base criteria for an innovative firm. Four of these organizations were ranked as innovative and two as non–innovative.

The analysis resulted in three main findings. 1) Leadership attention was focused on three general categories. a) Primarily individual motivation–driven factors, followed by b) systemic–driven factors, and c) externally ruled factors. 2) There are five critical areas of leadership attention: the product, the activists, the invention, the decision making, and the preconditions under which innovation takes place in the firm. This finding leads to a proposal of selected vital theories by which the success or failure can be predicted, and in which the results speak of the centrality of the activists. When the informal authorities of knowledge are the same

persons who have a high hierarchical position the structure for innovation becomes powerful and sustainable. 3) The dynamic movement of attention across categories are defined in this study as critical, central, peripheral, and loose dependencies, as leaders devoted more of their interview time talking about innovation leadership as part of firm leadership. It is worth mentioning at this point that this study does not support the notion of innovation as a systematic process. The results of the research contribute to the literature with a description of the thought world of leaders in mature innovative firms.

Characteristics of Leadership in Mature Innovative Firms

What, then, is special about innovation leadership in a mature firm that have grown into post–entrepreneurial firm? One essential feature of the mature firm is that it is managed and led by hired professional managers. Below is a summary of highlights introduced earlier in this book, which are proposed here as characteristics of leadership in mature innovative firms.

1. There is not one hero in the organization, but several persons with different knowledge profiles and quality of contributions. I have chosen to call them activists; they play the informal roles of rare knowledgeable persons engaged in a *team effort, who are not necessarily complying with the doctrine or norms of the firm*. When these authorities of knowledge in the informal world, also act in high positions of hierarchical power in the formal world, the result is the solid track record of successful innovations and business management.
2. These activist influence through *visible enthusiasm*, demonstrating their devotion by risking even their 'organizational life' for their beliefs. They appear to have a mission higher than the ordinary business mission, which is the origin of their internal force. The 'shareholder value' thinking is respected as one rule of the game, but at the same time regarded as narrow–minded thinking for

these activists, where firm long–range continuity is the most vital consideration.

3. The activists, supported by many loyal persons/colleagues in the organization, have *broad insights and long experience* from working with the firm, which is not possible to be in the possession of one person alone, nor to be transmitted by one person only in a mature midsized firm. The experience and insights are vital when confronting the unknown associated with innovation. In none of the successful innovative mature firms had the key activists been newly hired. On the contrary, more than ten years of experience within the firm was more a rule than an exception among the leaders interviewed. If the reputation for successful innovation cases in the organization is the basis for the informal authority, it is understandable that that quality of this resource cannot be hired, but must be cultivated. Applicable prior knowledge (Shane, 2003) of customer problems, markets, and ways to serve the market can be hired, but not the core of the innovation system solution.
4. The few activists in the organization are masters of dealing with *long cause–and–effect chains*, with products, persons, invention, certain preconditions, and decision making as the critical center area of attention. These topics were found to be the most highly interrelated and to have the widest associations across the empirical material. In other words, talking about these five matters was strongly related to discussions about all the other areas of attention in the thought world of the leaders that were interviewed in these innovative mature firms.
5. The management in a mature innovative firm seems to have the dynamic capability of sequential *switching of organizational attention* between seemingly conflicting strategies and organizational problems. This ability is achieved by having a dynamic orientation and by mastering either the mechanistic or the organic system of management, as required in different situations.

6. The activists work with breaking the *old structures* of the old unspoken organizational agreements and conventions, and rebuilding new ones.

— They master to bring along both such *interaction*, debate, processing that leads to a conclusion enough legitimate that the cycle of innovation is kept going. At the same time they influence through the communication of preconditions for success: situation analyses, debates about the fit between the idea and the ethos of the firm, and the firm's organization a whole. They likely reflect upon inherent elements like collective memory—company history and company culture—when positioning the idea and the future product.

— Either the activists themselves have, or they are in association with those actors who has ideas, but the ideas and *initiative* are the other strong force that sustains the state and cycle of innovativeness, as a part of the interaction between the activists.

— They act as catalysts and stimulators. Activists do not dictate and dominate discussion by force, but influence it in their role as one among equals, listening, being sensitive to emotions, and debating issues. At the end, however, the key activist unites minds through conclusive decisions, which shape the organization structures and the future innovative offering of the firm.

7. The organization is sensitive to the continuity of new knowledge creation and commercial and financial success. *New knowledge creation* through mingling, reflecting, combining, experimenting, doing, and contra–factual thinking (imaging alternative outcomes of past events) result in new information and experiences, which are the building blocks of the authority of knowledge. The commercial and financial success of the innovations arising from the new knowledge and the growth of authority are the building blocks of a vital *company cultur*e that is favorable to innovation.

The General Areas of Attention

The empirical material indicates that innovation in the firm is, on the one hand, a balancing act between reflective factors within the firm, primarily individual motivation–driven factors, followed in importance by system–driven factors. An individual motivation–driven factor is dependent upon the desire of the individual to take action; skills that are dormant until the individual decides to make use of them could serve as an example. A systemic factor is a more formal factor given by the systems of the collective organization—an activity–based costing system, for instance. This categorization of findings corresponds to earlier theory differentiating between two poles: *informal and formal organizations*. It also confirms the existing dual innovation theory of *organic and mechanical systems of management*.

This study contributes to existing knowledge through *the qualitative character of those two poles* when the theories are applied to innovative and mature firms. According to the results of this study, the formal and mechanic counterparts of the theories would be linked to the attention given to the organizational functions, the processes, the project administration, the commercial acts, and the economic aspects of the organization and management of the firm. Presumably, the firm's top management has a direct opportunity to influence or even to control the course of events in the systemic field. The results of this study suggest that the informal and the organic are connected more specifically to the attention given to the activists, invention, decision–making, practices, know–how, spirit, and leadership conditions. These pairs of theoretical concepts and empirical findings are not mutually exclusive, but are interrelated. It is argued that formal organization and a mechanistic management system are the right response to a stable and predictable business situation (Burnes & Stalker, 1961; Cyert & March). This argument implies that the systemic aspect serves to stabilize the internal operations of the firm and that the individual motivation–driven reflective factors serve well in the creation of new products, services, and methods, where the outcome is uncertain at

the beginning of the undertaking.

The theory of formal and informal organizations, in which the informal precedes the formal organization, just as the organic precedes the mechanic system of management, is also found in the results of this study. The managerial implication pinpoints the idea that only one mode of management system does not meet the needs of an innovative firm. The analysis demonstrated a unique quality of the management team in a repetitively innovative mature firm: the ability to perceive the correct timing and to know when to switch the system of management appropriate for creativity or for order and discipline. Because of the ability of management to allot 'sequential attention to problems' (Cyert & March, 1963), these priorities do not conflict.

The general attention in innovative firms, closely connected to the internal dynamics, is also on *external rulers*: factors outside the firm over which the firm has limited or no control. Here the dual theories fall short of reflecting the whole of the discussions in the empirical material. When applying both the theory of mechanistic vs. organic systems of management and the theory of formal vs. informal organizations, the predictability of the appropriate mode depends on whether the *environment* is stable or unstable. But what is in the environment, and, more specifically, what fluctuates? This study suggests that the answer is to be found by analyzing the more specific attributes of the environment, as defined in this study: the user, the use, the location of use, the appearance of a new product, the mediators, the customers, the partners, and the surrounding society. The firm is linked to the environment through the definition of its general organizational and managerial purpose. The purpose is a synthesis of the situation in the environment, or, as Bernard (1968) suggests, a sensible purpose of the firm is defined only in terms of the environment. The external rulers presented here are new knowledge of the qualitative attributes of what is generally discussed in the theories as 'the environment of the firm'. The proposal can be seen as complementary to or contrasting entrepreneurial and opportunity recognition theory (Shane, 2003),

which refer to changes in the socio–cultural, economic, and political and regulatory aspects of the environment; or to the theory of the firm, which refers to the probable behavior of customer, supplier, governmental regulatory bodies, and labor–union decision–making systems (Cyert & March, 1963).

Specific Critical Areas of Attention and Vital Predicting Theories

Further analysis of the most significant areas of attention was confirmed through the testing as the *critical areas of attention.* These findings correspond to existing knowledge and have brought new knowledge to light. The specific critical areas of leadership attention were defined in terms of the product, the activists, the invention, the decision making, and the preconditions under which innovation takes place in the firm. In line with existing knowledge and the dependency analysis of the five critical areas of attention, the test pinpoints the central role of the activists and the vital role of the *theory of promotors* in combination with the *theory of authority* as predictors of success. The results of this analysis lead to the suggestion that one should consider abandoning the term 'management support' in favor of 'management devotion' when discussing leadership in repetitively innovative mature firms.

As noted in the analysis of the six case stories, the lack of authorities among activists in the non–innovative firms is probably a key explanation for their failure to deliver innovations. This finding may be linked to the positive correlation between innovation success and activist tenure: the activists had usually had long tenure in the successful firms and short tenure in the unsuccessful firms. This finding elevates the centrality of the *theory of prior knowledge*, supporting the two theories discussed previously. A reflection of the empirical material leads one to believe that the broad field of attention and knowledge calls for one's own experience in a wide range of matters, in order to grasp the relationship between cause and effect in each discussion. It follows that innovation is not a realistic goal for one person working alone in a large firm. Good promotors are needed, and

prior research indicates that they do have a significant role to play.

Gaining experience from and successes and failures in each area of discussion requires a person to spend many years doing many things in a firm. Although innovations are known to emerge under unstable conditions (Burns & Stalker, 1961), a certain level of stability provided by the promotors is a vital contribution to the organization. Five of the six cases are located in non–metropolitan or relatively small cities, which seems to reduce the mobility of the key activists once they have been rooted in the firm. Stability achieved by the key actors by spending more than ten years of employment in one firm surely plays some role in maintaining innovation year after year. In several instances, the activists were, to some (unknown) degree, motivated by a concern for keeping the local operations and factory relevant to the world, and, through the vitality of the work of the others, built the sustainability of their own job. As one successful chief designer stated: 'Someone asked me, "What is my driver to work with things like this?" I replied, "To keep the neighborhood and the nation, and therefore me, employed"'. Long tenure in and of itself is not enough. Past truths and opportunities change when the environment is unstable, which leads to a proposal that the *theory of knowledge creation* is a vital complement to the theory of promotors in predicting innovation success.

Strategy is another factor comprising organizational stability and providing predictability, as explained by the *theory of emergent and deliberate strategy*. The emergent strategy in one of the cases provided proof of intense competition between an emergent strategy and the deliberate strategy. It does not seem critical which of these strategies applies, as long as evolution occurs. In any case, according to *the theory of generic strategies,* if product innovations are expected, there is a demand for strategic consistency addressing the conditions of a product–excellence strategy. In one of the unsuccessful cases, there is an evident and direct connection between the maturity of the management team, the lack of authorities of innovation in the firm, and the absence of a clear strategy. In the other unsuccessful

case, there was evidence of strategic thinking. There were, however, two competing strategies, and the true strategy of operational excellence reduced the propensity to deliver significant product and product–related innovations. Consequently, both unsuccessful firms faced complications when interfering with and disarming the decision–making process, as described by the *theory of decision making*. In the latter case, the inability to innovate can be largely explained by the *theory of company culture,* in which the retired entrepreneur and chair exerted a strong influence through the informal entrepreneurial structure, competing with an overly emphasized formal organization structure and mechanistic system of management propagated by the hired managing director. From this conflict followed adverse behavior among the succeeding generation of managers. As would be predicted by *the theory of organizational equilibrium,* they were hesitant to take the risk of contributing. In short, the right balance of formal and informal organization structure, in combination with an appropriate mode of mechanistic and organic systems of management applied in accordance with the theory of sequential attention to problems, appears to be as vital as the theory of promotors and the knowledge–creation theories in predicting innovation success.

The analysis of the five critical areas of attention across the life cycle of an innovation leads to two proposals. The balance of attention between the five critical facts remains the same across the cycle of innovation and the *level* of attention varies greatly during the different phases. A distinct low season for talks about innovation occurs after the product has left the factory and before the sales begin to take off.

The Dynamics of Attention on a Specific Level

Further analysis leads to a proposal about the dynamics of attention on a more specific level, as compared to the more general level of attention described previously. The interpretation was made on the assumption that managers would spend most of their interview time speaking about issues that reflect their priorities—how they believe they *should* be spending most

of their time in the capacity of a leader in the firm. The proposals were identified by and based upon simple statistical computing. To begin, four levels of attention could be distinguished. 1) The core of the attention, labeled *critical dependencies*, comprised the attention that was focused on five factors: the activists, the product, the invention, the decision making, and the preconditions of leadership. 2) The second level, labeled *central dependencies*, brought two further elements into the discussion: a) the spiritual element in the firm and b) the project administration, the acts of the sales process, the economic control, and the functional structures of the firm as a whole. 3) The third level, *loose associations*, caught the attention of a) the location of use, the appearance of the invention, the customers and cooperating partners and b) the skills and practical arrangements. 4) A fourth and final level, *peripheral associations*, included the remaining categories of discussions addressing a) the processes of the firm and b) the user, the use, the mediators, and the society in which the firm operates.

When analyzing the factors at each level, as previously proposed, a pattern of movement of attention begins to emerge, as the leaders devote more time to talking about leadership and innovation. If we compare the factors of the different levels, the merits for my claim become visible. At the highest level, the first, four individual motivation–driven and one externally ruled factor can be recognized. On the second level there is only one individual motivation–driven, but four systemic–driven factors. On the third level, there are four externally ruled and two subjective factors, and on the fourth level, four external rulers and one systemic factor are recognizable.

Discussion

This final discussion presents a few general reflections on the inability of firms to deliver innovations, a situation that seems to rest on a resistance to change. Certainly there are barriers. The field of complications and barriers, which has not been the focus of this study, is a much more complex issue than has been alluded to in this book. For one thing, what

seems to be a problem for one is an opportunity for another. In this study, the issue has been recorded if the matter is somehow in conflict with or a source of friction for the firm delivering innovations. For another thing, there is a longitudinal aspect to innovation. In this study, a distinction has been made among a matter of present concern, a concern of the past that exerts an effect on the present state of affairs, a past concern of no present relevance, and an issue that is seen as a potential future concern. According to my analysis, there are cases in which the problem has been made redundant—an indication of successful new knowledge creation and learning in the firm. Furthermore, those firms struggling with innovations have more unsolved problems of the past compared to those firms that are successfully delivering innovations.

If the resistance is in defense of the status quo, however, and specifically the current formal and informal structures of the organization, then the origin of the inability may be explained by *managerial blindness and unawareness of the actual informal structures of the firm and the nature of organic systems of management.* In other words, what is the latent and unconscious effect of the forces of that structure and its management? As presented in this study, the leadership of innovations in a firm is a large field of interrelated discussions and choices. Beyond that, the firm's leadership of ongoing innovation appears to be a riddle of mastering the *long chains of cause–and–effect* dependency relationships. My proposal is that the art of innovation management is about future dependencies, which, in part, have not yet been associated, not yet organized and recognized. If ambiguity dominates the problem of seeing the way in which parts of the daily operating system are actually arranged and coexist, then management consequently lacks determination, credibility, courage, and the power to master needed change in the firm that will render it innovative. Consequently, the train never leaves the station.

The lack of attention to the user in connection with both innovation and the process of innovation is a surprising outcome. To say the least, and based on the empirical material of this enquiry, the position of user–

driven innovation theory (von Hippel, 1986) does not predict the tendency of innovation well in these case firms. When it comes to the process of innovation, two surprising things occur. 1) The people at the top do not often use the word *innovation*. It seems to be an expression used only by those who watch others play the game. 2) The activists do not seem to associate innovation with a *process*. It is a reasonable expression, if one talks about the latter part of the course of events of innovation. At that point, things are more predictable and possible to program into routines of delivery. To name the entire course of innovation as a process does not seem to be sensible, as it highlights only the character of the later stages. If the misconception is further transported into the meaning of how to organize and manage things, there is a risk of applying formal organizations and a mechanical system of management in a situation and a phase that calls for an informal organization and an organic system of management.

In conclusion, the results suggest that the prime factors influencing the shaping of a product is a function of the inventive idea of somebody, the interpretation and conclusion of prevailing conditions by somebody, and the quality of the dialogue and decision making. Several examples of a changing situation occurred in the cases studied—examples in which an old idea introduced later became viable and successful. To talk about successful innovation is to talk about correct timing. I am therefore underlining the essence of the *theory of the situation and environment* referred to in this book. As one successful activist concluded, 'Chance favors a prepared mind'.

The End.

SVENSK RESUMÉ

Stora företag har i tidigare forskning funnits var lika benägna till innovation som små företag, vilka ofta betraktas som idealet för innovativ verksamhet. Detta motiveras av stora organisationer, liksom små, har båda sina specifika styrkor, men även svagheter. I tidigare forskning har efterlysts vidare forskning av ledningens specifikare roll i att leda det innovativa företaget. Syftet med avhandlingen har varit att undersöka ledning av innovativa äldre företag verksamma i konsumentvarubranschen. Mera specifikt har jag strävat till att kunna bestämma vilka uppmärksamhetsområden högsta ledningen fäster sin uppmärksamhet vid för att tillståndet och cykeln för innovation skall fortlöpa i det innovativa företaget.

För ändamålet har intervjuats 24 aktivister på området i sex företag. De undersökta företagen är medelstora industriella organsationer. I studien har tillämpats en kvalitativ forskningsansats. Vid tolkning av resultaten har främst tillämpas teorier med anknytning till företagets som en helhet, allmän lednings teori, samt allmän innovations teori.

Analysen frambringar tre huvudrön: 1) Ledningen focuserar generellt på tre områden: Främst 'individuella viljedrivna' faktorer, därefter 'systemdrivna' faktorer, och slutligen 'utifrån bestämda' faktorer. 2) Ur analysen framkom även fem specifikare uppmärksamhetsområden i ledandet och beroendeförhållanden mellan dessa: aktivitsterna, produkterna, idéskapandet, beslutsfattandet, samt betingelserna under vilka innovation sker i organisationen. Då dessa resultat förenas med teoribildning på området, framför jag ett ramverk för vad som förutsäger varför endel företag är innovativa och andra inte är innovativa. Aktivisternas centrala roll bekräftar tidigare forskning. Denna studie föreslår i vilken bemärkelse aktivisterna är centrala. 3) Då toppledningen förbrukar mera tid kring innovation, fanns att uppmärksamheten utvidgas enligt ett mönster, som i denna forskning defineras som: kritiska, centrala,

perifära och löst relaterade avhängigheter vid ledning av ett innovativt företag. Denna studie framför kritik mot hur innovation uppfattas som en process.

Den praktiska tillämpningen av resultaten av denna studie är en bättre förståelse för de i organisationen inbyggda benägenheterna, vilka står till hinder för innovation i företaget, samt med vilka medel det görs möjligt. Det senare underbyggs av ett urval teorier med vilka positiva resultat i vidare betraktelse funnits förklara tillkomsten av innovationer.

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APPENDIX A: CATEGORIES OF INNOVATION TERMINOLOGY

A literature review by done by Garcia & Galatone (2001) summarizes the following organization of categories for the term 'innovation':

- Johnson & Jones (1957): reformulated/new parts/remerchandising/new improvements/new products/new user/new market/new customers.
- Freeman (1994): systematic/major/minor/incremental/unrecorded.
- Henderson & Clarke (1990): incremental/modular/architectural/radical.
- Abemathy & Clark (1985): niche creation/architectural/regular/revolutionary.
- Moriarty & Cosnik (1990): incremental/evolutionary market/evolutionary technical/radical.
- Chandy & Tellis (2000): incremental/market breakthrough/technological breakthrough/radical.
- Tidd (1995): incremental/architectural/fusion/breakthrough.
- Kliensmidt & Cooper (1998): low innovativeness/moderate innovativeness/high innovativeness.
- Wheelwright & Clark (1992): incremental/new generation/radically new.
- In addition there is a range of dichotomous categorizations; discontinuous/continuous (Anderson & Tushman 1990), instrumental/ultimate (Grossman 1970), variations/reorientations (Norman 1971), true/adoption (Maidike & Zirger 1984), original/reformulated (Yon & Lilien 1985), innovations/reinnovations (Rothwell & Gardiner 1988), radical/routine (Meyers & Tucker 1989), evolutionary/revolutionary (Utterbach 1996), sustaining/disruptive (Christensen 1997), really new/incremental (Schmidt & Calatone 1998), breakthrough/incremental (Rice & Colarelli & Peters & Morone 1998) and radical/incremental (a.o. Balachandra & Friar 1997).

APPENDIX B: QUESTIONNAIRE

The questions for the interviews (translated from Finnish):

1. *How do you describe the role of innovative product development, as a part of the general business management, aiming at the firm success in the future?* How high has it been, or is it today, on the agenda of management team of the company? Which are the key business success factors today/tomorrow?
2. *What are the outspoken guidelines for product/service development and innovation?* What is the distinction between the desired and the undesired initiatives?
3. *What is the definition of the product (service) range strategy/offering of the firm?* How has it emerged? What was it like in the past?
4. ***What is the story and the journey of your X innovation?*** Picture what it/X is, what is innovative about it, how has the naming of it developed, what participation and contribution comes form the user.
5. *Who are the central persons in the X innovation case?* What is his position, role, contribution? External actors? Leading users?
6. *Can you define permanent kind of settings in the firm, facilitating the forwarding of new inventions, kind of acting as a best practice?* If you discontinue that something it would stall the initiative and result in chaos in the organization dealing with product development.
7. *What barriers do you experience in the making of new (product) ideas?* What causes delay/friction/termination of the process? Who resolves the barriers and how; give and example?
8. *Talk about your own role in the context of new ventures?*
9. *Was there something essential we have not addressed in our discussions?*

APPENDIX C: PROFILES FOR IDENTIFYING PROMOTORS

Bitte nennen Sie diejenigen Personen in *FIRMA,* die nach allgemeinem Verständnis:

… den Machtpromotor, der den nötigen hierarchischen Einfluss besitzt, den Fachpromotor, der das fachliche Wissen zur Innovation besitzt, den Prozesspromotor, der als innerbetrieblicher Verknüpfer zwischen Macht– und Fachpromotor agiert und den Beziehungspromotor, der als Bindeglied zu externen Partnern fungiert.

1– … als ausgewiesene technische bzw. verfahrensspezifische Fachexperten in Innovationsvorhaben, d.h. bei der Gestaltung neuer Produkte oder Prozesse, gelten
2– … mit ihrer Macht und ihrer Position einen besonders positiven Einfluss auf Innovationsvorhaben ausüben, indem Sie Barrieren des Nicht– Wollens bzw. der Hierarchie überwinden?
3– … durch ihre internen Organisationskenntnisse und ihr Kommunikationspotenzial einen Wertbeitrag zum firmeninternen Austausch in Innovationsprozessen liefern?
4– … in Folge ihrer ausgeprägten Kontaktfähigkeit sowie ihrer guten persönlichen Beziehungen zu wichtigen Akteuren (potenzieller) Partnerorganisationen einen Wertbeitrag in Projekten liefern?
5– … in Folge ihrer externen Informationsquellen und fachbezogenen Kontakte bei der Suche und Bewertung fachspezifischer Informationen (z. B. Leistungsfähigkeit neuer Produkte/ Technologien) zu Rate gezogen werden?“

Please name those persons in your COMPANY, which after general understanding:

1– … **seen as proven technical and/or** procedure–specific specialized experts in innovation projects, i.e. development of new products or processes.

2– … exert a particularly positive influence on innovation projects by overcoming barriers of the **hierarchy with their power and their position?**

3– … make a value contribution for the **company–internal knowledge–/information–exchange** within innovation projects by their organizational knowledge and their communication behaviour?

4– … make a value contribution within innovation projects by their pronounced contact ability as well as their **good personal relations with (important) supply partner organizations.**

5– … help to evaluate specialized information (e.g. **efficiency of new products/technologies)** on the basis of their external sources of information and their **external expert contacts?**

Sample Questions for the Identification of Expert, Power, Process, and Relationship Promotors

Expert Promotor

"This person solves product–related, technological problems"

"This person knows (identifies possibilities) how to increase the technological performance of the innovation"

"This person drives the product–related, technological development"

Power Promotor

"This person provides tangible and intangible resources for the innovation"

"This person protects with regards to the innovation involved employees and puts other competing projects back"

"This person makes major strategic decisions for the innovation"

"This person sets the goals for the innovation"

Process Promotor

"This person has a central role in the internal communication network with regard to the innovation"

"This person fosters and/or keeps the contact between the top–management advocate and the technical expert of the innovation"

"This person promotes the innovation actively with employees of other departments"

"This person leads all activities related to the innovation"

Relationship Promotor

"This person orchestrates the relationships between persons skilfully"

"This persons knows a lot about our own company" – "This person knows a lot about the other company" – "This person knows a lot about other relevant parties"

"This person has good relationships to important persons in our company / the other company" – "This person has good relationships to our suppliers / competitors"

"This person provides information between our company and our partners"

"This person actively fosters interactions between our employees and the employees of our partners"

"This person initiates personal contacts between employees of our firm and our partner firms"

"This person coordinates all relationship–related activities"

"This person is the driver for all relationship–related activities"

"This person solves problems between us and our partners"

Technological Gatekeeper

"This person actively gathers, translates, and encodes external information for his colleagues"

"This person facilitates the external communication of his colleagues"

"This person helps to identify experts outside the company"

"This person has extensive contacts to experts outside the company"

"This person has a high expert reputation in his field"

In literature, technological gatekeepers have so far mainly been identified with sociometric data and social network analysis ("Gatekeepers … are defined as those internal stars who maintain a high degree of extra–organization communication." (Tushman/Katz 1980, p.1076).

APPENDIX D: SAMPLE OF KEY WORDS RECORDED IN THE CODING

OPPORTUNITY RECOGNITION
(substantive "en")
From weak signals to conciousnes of opportunity recognition

 # alkulähde, inititiv
*paine, impussi, sigmaaleja, merkkejä *)*
virikkeitä, esikuva, havainto, miete
idea, aito innovatio, oivallus, keksintö,
artefakt, edante tanke, tar sikte, riktigt galet, absolut tokigt
tunnistaminen, huomio, löytäminen,
aha–upplevelse, (wow–effect),
varmanskunskap, ingenjörshandbok,
bakgård
/select/follow
/evaluate/ perässä seuraava uusi idea
kimmoke
/assumption/

 # ehdotuksia,
edelleenkehittämispyyntöjä, raamit,
pohja, sukulaisuus, mahdollisuus/
*possibility (opportunity), chans, andra chans, möjlighet **)*

iso kala /initiative/

CREATIVITY STAGES
The early "konkretisointi" from idea to PRODUCT
Syntymisprosessi. kehityspolku,
ribbhöjd, uppfinningshöjd
= uusi, tuotekehitys, kehitys (evolution),
bli sämre på, bygga upp, uppstå(ndelse)
peruskehitys
syntyminen, nyfödda
luonnos, piirtäminen design PROJECT
Ratkaisu ratkaisumalleja konstruktion
egna lösningar, system
finesser
rakentaminen (proto)
mallintaminen
/beräkning/

No:1 polven esine
vaihtoehto, reseptejä
nimeäminen
tuotteistaminen
patentin haku
protomateriaalia; tuoteproto,
toimintaproto
muokkaaminen, muutoskierros
pyöriä mukana
viimeistely
versio
testitulos
nollasarja (tuotantoympäristössä),
protosarja, testisarja
tuotantovalmis
lisäviilauksia /practical/

uusi sukupolvi tuote
kypsä, något kul

CREATIONS
innovaatio, valmis innovaatio,
valmiiksipureskellut, väligenomtänkt
yksityiskohtakeksintö
jatkokehitys /revised/feleliminering/
puolivalmistuote
seuraava versio
tuoteparannus
toinen sukupolvi
– tuotevaihto PR
face lift
tuotevariaatiot
vanhentunut tuote
seuraava
världsnyhet
futuristinen
ideportfölj

MEANS OF CREATIVITY
"keinoja ideoita tuotetaan
kehittäminen
harrastaminen live the product gör själv
scratch
criterias, karakterisera
luominen
rita
omatekoinen
menetelmä
hyödyntäminen ta in
tunnetut elementit, olemassaolevat
haku
kontrast
interviews
arvuutella, Ur Ärmen
kuvitteleminen, laatikon ulkop
kokeilu experimemtera
test / fälttest, koeasennus,
todentaminen, prova
soveltaa, överföra
omaksua adopt sopeutua
kopioniti, vastaava
yhdistäminen, yhdistelmä
vanha + uusi, meidän+muiden,
yhteensovittaminen/integrate koppla till
kombination kytketty
eriyttäminen, erotteleminen,
pilkkominen, ositus se parantaminen,
trimning, förfina
ongelmanratkaisu
yksinkertaistaminen, riisuminen
modifiointi restyling
benchmark, rinnnastus, analogi
jatkojalustus, line–extention,
laventaminen
design kehitys
teknologia kehtiys
monennäköistä meneillään
gå tillbaka/ta ibruk
prova sej fram/ få fram
ylösalaisin
tulevaisuuden semiaari
foot work Cambrid
peruskehittäminen
styling
myyntim ehd
tasapaino ...requirements
"ta fram en bra produkt"
standardlösning
sammanställa, välja, poimia
mahdollistaa
bakvägen

(...)

APPENDIX E: SAMPLE OF QUOTATIONS USED IN THE CAUSALITY ANALYSIS

Actors, Ideas, Dialogue, Conditions, Product streams

Actor stream

Actors–Conditions [A–C]

Activist – Given

"When the *key persons* from our *domestic* and long–term key grinder partner left they could deliver their share of the development project, and we run into difficulties."

"Well, as our product development is rather much *led from UK,* and Igor is the *anchorman* now, our production partner fell out of the picture in the development process. Actually their readiness for the co–operation was also poor".

Act ← Giv

Activist – Establishment

"When we think or leadership we found that we cannot manage *professionals* coming from the *IT industry* who come from software houses, who has sat on the shores, etc. as we treat our old mechanical people"

"This *Yankee* [head office] mentality with quarterly reports does influence us. They are so short sighted and it leads to explanations, if we have not made it. I may buy time saying that the *artists* have their periods. Oscar´s track record is so solid that we manage".

Act ←→ Est

Actor – Self–perception

"our *creative director* has not been able to create an *high level definition of this company,* that would describe the range of our products.

"Joe {owner} said to me, just do it! This kind of building project is *what Humanist has been about,* and should be about again in the future; supplier of complete solutions for living. Not a mere furniture supplier"

Act → Sel

Actor – Strategy

"You can hire *professional designers,* instead of growing that competence in house. Professionals like *Beawer* develop his competence and excel in their own niche. We combine this with boat building tradition and we have found this *strategy* to be right for us".

Act ←→ Str

Actors–Ideas {A–I}

Activist – Weakening

"**I** was ex tempore *exploring* grinding techniques for our axes. **I** came to *become conscious* of new technique *substituting* the present would to the job better, which I told *my boss* about. I was amazed when my *boss* came later and told me he had bout the machine. I was proud as I was only 24 at that time. But instantly it hit me my responsibility to make it work".

"Who of the *salesmen* sell was by and large dependent on who found the interest and *embraced the idea* of the novel faucet."

Act ←→ W

Activist – Evolution (Means of Creativity)

"Hans works ***like an engineer,*** he *creates* for a particular need and context, and how we agree upon it".

"There is an ***inventive bloke*** at the skidoo factory, who has built aeroplanes and lots of other projects. I asked him if he could *prepare and build* prototype of a play ground module that rotates and rocks".

"we try to find a new balance between internal and external competencies; to *combine* different sources of know–how around the product and process. Then it is taking a very different approach and my role is ***promoter*** of the relationships".

"Hans contributes and regards the product from a *design perspective,* with emphasis on safety and functionality of the product*".*

Act → Ev

Activist – Creations

"**Oscar** had made some *prototypes* of his idea and **I traveled** around and *sold the idea*. When we had the back up and enough of orders it was easy to do the decision to invest".

"I had the idea in the management team in the 70–ies, that we might engage *an* ***industrial designer*** in our projects. At that time we engaged industrial designer Jack Jones, who later served us as a consultant up to recent days. He contributed with an *independent view."*

"here is a ***inventor bloke*** who is at the skidoo factory – he has built them a new skidoo, built an light aeroplane – whom *I* asked for a *prototype* to be built, you know which both rotates and rocks. He said I´ll do it and made it, but his *drawings* were not accurate and we had troubles with tolerances"

Act → Crea

Actors – Dialogue/Decision [A–D]

Activist – Impulse

"The timing for the launch of Humanist's ***initiatives*** is very well living in current times. It makes *me* [CEO] feel like I have newer *felt* this *confident* of the success of our company.

"the downside with these high ***personalities*** is, that they strongly *believe* they are right when they come with *proposals*".

"the ***suggestion*** is that when we go beyond our core competence, into electronics, we need to have a *driving force* who can specify and arrange that we get what we need".

Act ←→ Imp

Actor – Emotion

"Not anymore, but in the beginning the *management* was confused had difficulties to ***speak with*** and *understand* the electrical experts that were new competencies in our house".

Act ←→ Em

Actor – Conversation/Decision

"The cylinder products and the development of them are vital for the future of this firm. The project was *blessed* by *group* ***managing director*** from the start. We never had problem with the *engagement* of people in this project".

Act – Con

Actor – Decision

"Before we do a *product decisio*n ***Peter*** needs to come up with pretty good forecasts. It is no use if ***R&D*** *{person} alone does it*, because it will never become a business."

"The *plumber* does 70% of the faucet *choice decisions*. The plumber is *very technically oriented*; he is seldom a *business man*. If he has two faucets, we will probably *recommend* the cheaper, regardless that he would ear more with the more expensive one. But his thinking is that he is ***honest to you***, when he thinks the products do equally well".

Act → Dec

Actors – Products

Actor – Concept

"the US agent has been very involved in how the Exodus 42 New York *yacht* should be built"

Act → Con

Actor – Engineering

"we have two ***inventors*** in our in the Safe project organization, who found the *solution* pretty fast"

"when we developed the *components* for playground gear for disabled we had engaged ***specialist from the university*** in the project team"

Act → Eng

Product stream

Product – Idea

Concept – Wakening

"in case of a *known product and technology*, the *impulse* in principle comes from the customers. In case of a totally new product, the *idea and intuition* it primarily starts from inside the company"

W ←→ **C**

Concept – Requirements

"the price is high, but *they* last. May be the ***wear–tear*** philosophy gives way for recognition of the waste and return to ***durable*** ideals when speaking of *furniture*. That it is not only ***fashion".***

"we call this the one *shot pruner*, as they are joined in one shot. The *one shot pruner* was superior due to its ***simplicity, a unique thing*** and it ***sold itself".***

"we talk about *dual cross yachts* which have life after the racing circus. Like the S42 too, it is ***reasonably fast, beautiful*** cruising yacht too."

Req → Con

Concept – Evolution

"in late 80–ies weaknesses appeared in the lock technology. The toads invented a method how to overcome the *security mechanism* of the lock"

Ev ←→ Con

Concept – Creations

"the *L–shaped chair leg* from the 40–ies is brilliant. It makes the chair pliable. The L–shape is a *universal module* for all Simon Storm *furniture*. It is applied in tables, armchairs, and so on. It is a *well thought* logical *system* that diverged from the traditional furniture of that time. I some respect like Ikea of today, and centuries earlier".

Cr → Con

Engineering – Wakening; se ovan.

"when we talk with our customers who cut in their garden we hear them complaining about something, like not reaching high enough. The say to us ,could you not think about something; a *longer shaft* or something'. When we hear it enough many times we see that there is a demand for *something new*".

W ←→ Eng

Engineering – Requirement

"we have this stool with white or black ***linoleum*** surface, ***upholstered, stained*** surface, etc. a number of different *variants* which are needed for different customers

"Humanist fits, we talk about both public and home milieu. For me *Humanist design*, just to say one word, our product ***have to fit in both kind of places"***

"When the yacht is sold it takes a certain number of weeks until the production starts. You have to complete with all the ***engineering,*** drawings, and ***materials*** to plan for a *sensible production* and not to work ad hoc, which is unfortunately typical in this industry".

Req ←→ Eng

Engineering – Evolution "; se ovan.

"The launch of Molbile play grounds was more about new *technical* solutions, than I would have brought along *something revolutionary new* to children's play".

Ev ←→ Con

Engineering – Creations

"in 1974 I started to draw this ***system***, the first play ground concept, which I ***named*** according the chief gardener of Stockholm City and his wife, '*Pekka*' and '*Liisa*'. It was built first built in Kungsparken, some alterations have been made, the ***ladders, stairs*** and the ***net,*** not that climbing rack. And this is still today our best selling product. And has it not *lasted*!".

Cr ← Eng

"what is competitive *technology* is the next question in the lock business. Meaning, when our customers are immensely sensitive organizations; they are looking for the ultimate *security product*".

Product – Dialogue to Decisions [P–D]

Concept / Trigger

"Wilkingson had a ***garden products,*** they even had own manufacturing and were even pretty capable, however, their products were expensive and rather standard. And that was where thought we need to *get in*".

"we produce too many and all kinds of ***runner products,*** but they are not all that bad, because among the runners you also find unexploited ideas. They are *brought up for discussion* so everybody become aware of which we go for".

Con → Tr

Features – Trigger

"we got to create added value. Clearly we had been able to create added value in public and half–public locations trough this *touch free feature of the product*".

"the came *pressure* due to the *Guardian Pro*, which patents were not renewed".

Fea → Tr

Engineering – Trigger

The foundation was more into the restrictions on dimensions of the products, in stead of ***promoting*** the *concept of Simon Storm* about the human living space and the comfort of tenancy and the improvement of it".

"The idea of the [cutter] product was of course Oscar's. It was prohibited during that time, we were ***fighting from an weak position.*** I had no problem with that, it was only interesting the *technical* challenges.

Eng ← Tr

Concept – Emotions / Dialogue

"I *said ok*, let us try. We had *white painted furniture* that we *presented*, so that the different *items* would not look salad of herrings. *I regret* I accepted that. The *critic* of the *product* was not particularly good"

Con → Em

Features – Emotions

"I have the *feeling* that our *hardship* culminates in the fact that we do too much ***customized products".***

"*in my mind* the focus was wrong, to be centred around the ***design of individual product".***

"cause we for some sizes of yachts you know already, that you need a ***flush deck*** solution, *cabins only forward*, different *keels* for example, *shallow water*

or *racing kee*l. Now, in the development of the new product, we insert also different solutions, so that the customer when he is coming here he says "OK, this is the best solution you can have" Having Adventurer put all the experience in this solution, you can not *dare* to have anything better".

Fea → Em

"I am *of the opinion* that we our products slowly loose their *meaning*, if we do not link and integrate *technology in our products*".

"we use to *think and wonder* about where the products come from, which are sold as *pirate products*. A usual source is China".

"We were in trouble we had these '*electronic ideas*' which back fired. When I joined in 1992. I ***thought that never again*** should we be in a situation like this with technology. And we have looked after that we all the time have new '*product recipes*' available for the market.

Features – Conversations

"we had kind of *novelty products* in Milano 2005, stools made with Simon Storm legs, new colouring, but with the dimensions were wrong. The foundation and the family behind the legacy of Aalto apparently did not ***communicate with each*** other too well.

"the idea was mine, but trough ***conversations*** with the others, we did the *folding scissor* trough in moulded assembly"

Fea → Co

"the *shaft joints of the cutter* should be lubricated once in a while, it is even *pointed out* on the package. But nobody reads the user instructions, why it gets slow–moving"

Concept – Conversation

"the plan is; we calculate the price of the ***hotel rooms*** and then we go to *fight* to London about whether we use junior resources or professionals for this assignment"

"the customer is the main source of innovation for us. First of all, because they are really experienced users of our *yachts*, and unfortunately here in our company we are not extensive users of our products, we do not 'live' the product. And ***talking*** to our customer, the specification of the product is the most important part of our relationship with our customer".

Eng → Em

Engineering – Conversation

"two weeks before Habitare *I said* we will not expose any of them, that this is only crap. Also David was of the *opinion* that they were ***technically to fragile*** and below acceptable"

"In the 1960:ies a factory manager was very interested in ***technology*** development and grinding technology. He believed in it so strongly he even purchased a machine for that, without permission. Later he had to explain himself to the CEO. The factory manger got fired. If he had had even one merit from the past his position has been stronger. Furthermore, he was *not humble* at all when *explaining* his strategy. Eventually the decision to fire him tipped over because of the personal *irritation* of his boss".

Eng → Co

Engineering – Emotions

"Kelly lost his ***self confidence*** due to language problems in the discussions. Why he is air to Dick and Jim. Which is a pity, because he grasps the *structure* and the *technical aspects* of the chair very well".

"our customer are immensely ***sensitive*** and the next question is what is competitive *technology* to meet that".

Eng → Em

Concept – Decision

"it is up to the business unit which development path they ***decide*** *to go*. Take for instance some new product development, *din–lock development*, from that follows automatically and half–by–force the next development project".

"the US was seen as a potential market and some scissors were exported there. But for instance the tariffs of the ***imported cutter*** were rather high in those days. I guess this was the grounds for *deciding* to form a company there"

Con ←→ **Dec**

Features – Decision

"It is fantastic the name, it has to be playful in the art of designing, but it also has to ***work technically*** and it has to be technically innovative. And for me it is easy for me to brief and how we act; it is easy to *choose out* so that we can *concentrate* yourselves on what we should do".

"clients are not allowed have opinions on how this yacht is built and rather strict rules are applied for everything. It is very little that may be alternated and very *few optional features*. But it is a club which ***rules and decides*** the configuration."

Fea → Dec

Engineering – Decision

"we have made the proposals two years of the ***components*** to be discontinued and in general those have *approved*".

"we see that we have to master how *brass*, *plastics*, *electronics* are applied in 'water furniture'. We see that the synergy between ***electronics and plastics*** is evident, and that is why we *decided* to grow our electrical competence to develop the products of the future".

"we have a steering team, where in principle the management is present and we threw ideas on the walls and discussed about them and *decided*,

which work, which ***design language,*** etc..

Eng → Dec

Product – Conditions

Concepts – Given

"the factory was built concentrating on scissors. But it was *evident* that the factory would not *survive* in the long run, if we do not head for something new, the garden tools".

Con ← G

Concepts – Establishment

"along with the new *owner*, the company has been more oriented towards *racing than cruising yachts*".

Con ← Est

Concept – Self–perception

"Building living spaces is very Humanist, or what we should do. Not focusing merely on individual furniture, but the entire milieu."

Con ← Sel

Concepts – Situation

"I find it as a *weakness* that our product development is not market driven. We have two or three person'*s personal opinion* what we should do"

Con → Sit

Concept – Strategy

"My Swedish country manger said he had a deal of valves worth one million euro; he asked, shall I do it? I answered that if you do you get fired! Only revenues from selling faucets have strategic relevance."

Con ← Str

Engineering – Given

"the ***yachting industry*** has that small volumes, that we are lacking of time for proper planning of *materials*, how *to build efficiently*, etc.".

Fe ← G

Engineering – Establishment

"the project had a steering team, where also the **senior management** was present. In the meetings we discussed ideas, *what works*, *what designs* are approved, etc."

Eng ← Est

Engineering – Self–perception

"the concept of using famous designers for *development when building the yacht* was the *original idea of the company*"

Fe ← Sel

Engineering – Situation

"when I took charge of the business unit, I thought this is ***the last time*** that the *technology of our patents expire*s. We have had early electronic solutions that had back fired. But now we all the time have something in the pipeline".

Eng ← Sit

Engineering – Strategy

"We had a clear *vision* in late 1980:ies that we need introduce electronics in the design of our faucets".

Fe ← Str

Conditions stream

Conditions – Idea

Wakening – Given

"we get every second year an survey of the market. But it does usually not bring anything *revolutionary news*. But it is still needed in order to follow trends where ***the world*** is going".

"A visionary in this *industry* is Luca. Yachts you see now, the shorthanded yachts, the yachts with flush decks—seems to be very easy—but the mainstreams are because of ***Luca entering*** and changing the rule of the business"

"there is jealousy of people thinking that whatever they *create* is secret. This is really a trap, because they see Adventurer as *unique in everything* he does. It is not true! You think it unique, but you have not seen the ***outside world."***

"Ben will make an presentation about how he has trough segmentation of the market has *found new opportunities* and growth in ***Holland".***

W ← **G**

Wakening – Establishment

"the role of the ***management and owners*** in a company like this should be to support the belief during challenging times of an courageous *new idea*"

"the good side with ***autonomy*** [establishment]is that people take and carry responsibility. The down side materialized in a too f*uturistic ideas*. Things had gone too far to be stopped, so we tried the commercial path, but failed. We were before our time."

W ← **E**

Wake – Self–perception

"Humanist is today a *supplier of furniture*….and very domistic oriented… we have to figure out what ***Humanist could be*** abroad internationally, to make an ***synthesis,*** and then to bring forward *new product ideas*. With this product range we will not make it"

W → Sel

Wakening – Situation

"The s*ituation* today when *new people have joined the company; it puts pressure on us elder*. But I see it as remarkably positive. New people bring in *new ideas* and questions arrangements that we elder do not come to reflect on. We are blind."

W ← **Sit**

Wakening / Strategy

"*innovation* has been high on my agenda, and it has been a *strategic cornerstone* of the company"

W ← **Str**

Requirements / Given

"it was like an international match between *domestic and US*; who *produces more efficiently*. And, the one shot technology was a thing where we had potential to beat the fingers of our colleagues. Now a day, the economical threat comes from the *Far East* and competition from the rest of Europe on the garden sector. The cost pressure is enormous. {requirements–conditions}

"the authorities *domestically* and safety sensitive customers have not had to support importers of locks due to *security weaknesses* of products available in this country".{requirements–conditions}

"we have the production of old metal products, spades and hoes, marginal, *nothing unique products*; I am working with moving the manufacturing from

here to ***Poland.*** We [in Finland] have to do with more you know, *smart products*, *smart designs* of the products and to make them *production friendly*". Poland belongs to my region; I can do it easily without asking anybody. [requirement–conditions]

Req ← G

Requirements / Inherent

"this coincided that we had the ***earlier generation*** product Safety. We tried to utilize existing constructions; particularly with the logic that we had a tested a particular design and we know the tools, all to make *secure solutions in detail*." [requirements–inherent]

"this was a very typical paper ***scissor in the 50.ies and the 60***:ies, that people used to cut rag rugs and got chafed fingers. Actually, people instantly knew when they got the new product in their hands that here somebody *has solved something better for me*, and were not afraid to try it. It was a success from the very beginning". [requirements–inherent]

"we are massively using carbon fibre because of it is the material, ***light weight, stiff,*** etc. We are going out of the *tradition with a single skin boat*, because we are seeing the positive side of the sandwich construction in terms of ***sound proof*** and also you keep the *temperature low*". [requirements–inherent]

Req ←→ I

Requirement / Establishment

"this electronic key is of the typical 'big' things and has cost a fortune; beyond the ordinary ***electric*** challenge, there was the ***safety*** aspect and ***two way communication,*** you had to secure it is ***shock–proof***, you had to consider the distribution outlets, and it was not made easier at all that the key was to be ***smaller as a watch.*** Little by little we realized it was to challenging for us alone and the *group management team* made a decision to make it a group project".

"Exodus yachts used to be definitely *built to last*; you'd never have to be afraid it gets broken. Since the ***Leroy Fredman*** became owners we have gone into another niche, that is to say *racing*. It has led us to reduce materials all along; more extreme materials came into the picture. These yachts were to become considerably *lighter* and such things".

"Take the electro–mechanical locks. In it you find small engines, electronics, etc. First we did it the wrong way; we stated electrifying mechanical locks to get the functionality. We made ugly lumps, which enabled us to test them on the market and to see that there is an enormous market, *expectations and needs*. Then Kim Strong came from the *building lock division* and we turned it upside down; we started from scratch to design electric locks."

Req ← G

"it is just it, it is like the system is there and consists of that it does not exist. It is damn flexible and that is what is in my mind dead important; not to look for patented solutions for situations"

Requirements / Self–Perception

"Humanist is an ***institution*** not a brand. Brands are built to be something and very commercial, whereas I see Humanist Company as a 'commercialized *ideology'*. I see it reduced to functionality; it has to be of *functional* value to the user. Furthermore it has to be *esthetic*, giving room to the artistic"

"The *way of Adventurer is to make sure* that we don't make the experience in the hands of the customer and we are trying to avoid giving the customer the experience; the negative side of innovation. In that respect ***we are always a little behind the real innovator.*** But once the customer of Adventurer gets his boat, then there is *reliability* behind and that reliability means *experience*".

"today is not because we don't have money or management to drive a company who has all the discipline, but it's more a business model,

because we have to acknowledge that in order to be able to offer the *best yacht in the world*, you must have the best know–how and the best experience in the house, this is not possible, it is that, so we have to integrate the experience of the people that are the best in their field. And in that respect we are more and more an ***integrator of competences***, not only in the production but also in the technical office.

"Compared to ***smaller yards,*** well, in principle, money is not a limitation for us. In principle we go where we like; we have money to bring forward a *new good product*. If a new *calculation* for a keel is needed, if we wan to test a *new material* we just do it and do not ask 'do we have money'. Maybe we actually cannot afford it, but this is so self–evident."

"we are ***one of the strongest supplier*** of the thermostat faucet, and that is always a shower faucet. And a very intimate situation. You are nude in the shower, and if the water *temperature variants*, it is immensely embarrassing. If you cannot find your spectacles it may even be troublesome". [requirement–self–perception]

Req ← Sel

Requirements / Situation

"we understand it as our strength, but also as our weakness, that we have gained *strength in delivering something better directly to the consumers*. I use to draw a figure of the consumer's problem and need that we shall recognize and solve, and sell what we have arrived at, what hopefully the ***consumer understands*** or *pleases him*. If not we have failed. It is then an example of products that have not gained the understanding of the consumer.

"we are in a kind of a *now–or–newer situation*, when we see, now we have been able to make such a product of ***added value*** in terms of price, and it should start to interest the consumers and households".

"they renewed every lock, an my old my, there were locks to *renew*. The next phase was, ***something happened,*** and then the Canadian mail came in a rush and we sold them two million lock units to *renew*".

"you have the ***design already done*** and they are selecting the yard, so the real value in this world is *flexibility* on one side, *time to market* – because they do not want to wait ages – and mainly *quality*. We are trying to add the forth leg which is reliability, because we are not going to build anything that is not *proven*".

"*today* we are seeing the economical threats coming from Far Eeast. We have stay in, the *cost pressure* is enormous".

Req ← Sit

Requirement / Strategy

"we always seek to make an *absolutely secure* i.e. good product. There are lock manufacturers on the world who bring at the same time new locks and at the same time picklocks how to open them. We do not have such a ***philosophy*** or thinking, we aim for *unconditionally safety*."

It is a ***'wear–and–tear' philosophy,*** where people maybe come to realize what waste it is and return to so to say *sustaining ideals* when it comes to furniture, that they are not only a fashion"

"it is a product of a ***strategic direction.*** We have unequivocally stated this is our direction. It is a fine thing that there has been belief in it for so long time, and now it is of course easier to breath when we have started to talk about *substantial sales*"

"if you talk about any big design brands, they rely on professionals, because this has not had to be ***core competence*** in house, to be best in the world designing yacht hulls, faucets or anything, it is outsourced. We combine it with the boat building tradition and receive a concept we know cannot be wrong. We can be secure that 'hey it comes from there, but okay, *it works*'. Our role is to package it".

Req ← Str

Evolution – Given

"we do our *laboratory tests*, and try out how the keys are affected by use, but it is overbearingly important to get as fast as possible experience from the ***real environment of use*** in the fields".

"surely there is *an* ***expectation value on the Finnish market,*** to see that something happens or what is the *next new* that Humanist brings out. Or, just to see what is the new product, bamboo or something, which emerges

"Humanist should be *combined* or should buy an *architectural firm*",

"we have been able to *combine* faucets with *low–current technology {external}* which should make it more difficult to *copy.*"

Ev ← **G**

Evolution – Establishment

"all of a sudden we were about to do rope products, until ***we {in the management team}*** concluded, that our priorities are now elsewhere. We should not destroy what we have here now, but *complete it*, get it on the market, get cash flow and so on."

"you know we are a ***lean organization.*** Next week we have an international sales conference the Nordic countries, mid Europe and east Europe. Then our *country manager* Janne is there too. We aim to *filter real information* from there and hopefully to *utilize it further in the development*.".

Ev ← **E**

Evolution – Self–perception

"we are this kind of an *innovative* ***user of wood,*** i.e. we are *not producers of the mass*. And that is probably why *we are successful*; if we were in mass production there would be other makers too. We are with our method pretty exotic on the market".

"Think about the ***Exodus 60, then became E62, then became E65,*** and we have still equipment to sell this boat. It is really a model 15 years old. I think if we do this *way*, the products become traditional. We avoid in *our*

company, with the heritage we have, to create and destroy every second year.

Ev → Sel

Evolution – Situation

"this may sound as a cliché, that we do ***product development, manufacture and marketing,*** and this is the strong thing, *we have today all these sub–fields in our own hands."*

"if we want for instance to test, we just *test* it, we do it without hesitation. Maybe, we could not always afford *development*, but us doing it is self–evident. I think we can afford it. It *is so well run in* to make the end product as good as it is. However, to *get it built rationally does not work*, to get enough money out of it – that we have to work more on".

"we do inspections, we maintain, we keep a register on behalf of the customer, we know the need better than the customer, and we can tell him what is ***the situation on the his yard,*** what needs to be *renewed or remade*".

"it was decided that we would not go into making garden tools. This was masked as a *technology project*, and I think it is rather ***typical situation*** in companies".

Evolution – Strategy

"it has been our conviction behind that a certain ***core competence*** need to be in own hands, in order to be able to *apply* it efficiently into our own business".

"we are a strong ***single brand house, and this user friendliness, design and technique*** need to go hand in hand. Sometimes the emphasis is on one and sometimes on the other, which need to be *balanced*".

"Definitely, this *evolution* of the market has driven ***Adventurer to follow this;*** "How can we, looking at the statistics we see that there is a lot of money there, how can we enter into this market. And the idea and the real innovation was *how can to apply* the heritage we adopted in the one design yacht, even with a very different product".

Ev ← **Sit**

Creations / Given

"I have found that modern school of marketing really does not fit our *industry*; to place the R&D under marketing. It belongs to industries where you follow trends, do product *modifications*, fashion things like that".

"he has a long experience from the ***furniture industry,*** he has, he has got to build the *product development process*; how does our product development work and what gates do the products proceed trough".

"in the 70:ies and 80:ies a firm like Humanist values were not really regarded as contemporary. If you look at the consumption in the 80:ies, where Ikea came, it was particularly to *sell individual furniture*, but they were well dropped into an visual environment. The ***wear–and–tear values*** came to dominate over quality."

Creations – Inherent

Creation – Given

"we aim at doing very comprehensive *trial installations*, we have own laboratory tests to try out abrasion of the keys and things. But it is vitally important to come to an ***actual environment out in the fields*** to see how it works".

"we only had our *semi finished new products*. But I said, let's show *the process*, that we have a product development process that has started. I bought time, again, but ***domestic market*** did not give me the time"

Cr ← G

Creations – Establishment

"when things come on *my table* they are always unsettled matters, which need to be taken all the way trough to be clarified. Take the case where the ***painting did not work.*** We had used paint by Asconobel who had their own arguments. We had to take here their *director of R&D* to get the truth out".

"I do not agree with the traditional school of marketing to organize the development to the ***marketing department.*** It is for industries who do *product modifications*, fashion things an so on, where I can imagine that the marketing department can be the diver and give the tasks".

Cr ← **E**

Creations – Self–perception

"*Innovativeness* in my leadership *philosophy, and it has also been* ***high at Guardian,*** has been one corner stone. I have preached continuously that it will become nothing unless we do *something new* all the time".

"I would say that we have become, in a way, more ***intellectual and again cultivated,*** because we start to become an authority in the art and culture context, that we for instance ***understand things.*** We are like asked by the Pompidou Centre to deliver a new *chair design* and manufacturing".

Cr ← **Sel**

Creations – Situation

"The market is rather competitive, well, you talk about these as classics, they stand in a category of their own. They were *avant garde furniture* when ***they were brought up,*** which they of course are not anymore ***today,*** even though many people think they are modern. They have a *symbolic value, may be even a status value.* There is a lot of history which go along with this piece of furniture, much more than in new products".

"We have had *situations* where Oscar has come up with ***something really mad*** and three months later we have ha a *completed product*".

"the ***world which we live in*** is that we secure things before ***new products*** are launched. *Alfred is used to* direct action, he is an innovative chap, and when he comes across ideas and thoughts……".

Cr ←→ **Sit**

Creations – Strategy

”I am aware that you cannot talk about it today, about employment in the neighborhood, or your own employment, or somebody else’s employment, or that the economy of the municipality goes bankrupt, it is totally irrelevant factors in this ’global economy’ and in ’*shareholder value*’ thinking. For the most it is too abstract to grasp how to ’*increase value*’ for those who own this ‘firm’. It is not ethically, morally, or anything, enough *exciting goal*. There has to be something else! Like pure ***curiosity*** to find out ’*does this solution and technique work*’ and ’*can this be built like this*’? Or something”.

“we did not have authorization, *legitimacy*, to work with these things, it was not the *niche designated* to [us in the group]. But when I mingled with people and collegues trying out ideas, and somebody said damn ***good idea,*** and it would be cheaper, then Oscar made some ***prototypes*** which I demonstrated around me. It was easy to justify the investment, when I had some orders with significant volumes as back–up”

“we have decided upon a *product development strategy*, a ***road map,*** an with that we assign certain *‘normal” new* product development projects.

“TechGear was a strong idea, yes, let´s put a *chip into the wood* of the play ground equipment. But there also was the other side, the analytical approach; problems in society; ageing people, overweight children, poor condition of youth, learning disabilities, etc. It was purely **a *strategic, or analysis,*** or a conception that this need to be solved”.

Cr ←→ **Str**

Conditions – Dialogue

Trigger / Given

"We *aspired* for product leadership, which also relates to and considers our ***geographical location*** and competitiveness, which led us to the conclusion to increase the degree of know–how in our concepts.

G → Tr

Emotions / Given

"We have had this very raw material based *discussion*; do we stick to wood or do we introduce metal and plastic in our products? It has been *very emotional*. In a way you understand it, it is a very hot issue, because the location of ***the firm*** is based on the idea of wood".

G → Em

Conversation / Given

"what we get from ***London*** is more of an *international sentiment*, when they meet customers in various counties, and the response we get there".

"the leadership of the consumer division was transferred to ***USA*** some times in the end of 80:ies, but this bonus scheme of theirs was not proper even at that time. I have *debated* much about it, how it is connected to the product development; economic values and sales values".

"the ***European Union*** has brought, like in France even more officials who *resist everything*, and also the Danes are good at."

G → Con

Decision / Given

"the saw a potential ***market in the USA,*** and at that time there was some scissor exports and heavy customs ***duty at the US boarder.*** That was the grounds for the *decision to establish a company* there".

G → De

Self–perception – Trigger

"Guardian Company is a firm that *strength is based on technology*. When we *introduced* the Classic lock in early 80:ies it was cutting edge lock technology. Even in 1999 it was awarded in US –99 as the commercially best lock available".

S ←→ Tr

Self–perception – Emotions

"Italian leaking taps had a unreliable reputation amongst architects. But we added our *reliability* to it. I have recognized, in a way, how the design society, architects, interior magazines, etc. has been really…, we even got the award for it. They said it was such a amazing affair this with Simon Storm, that you were *courageous* to do it".

"Plumber Company was prepared to go into that mode, it fit into the situation of both the companies; from our side there was certain *willingness* and we *felt* we were to gain as we are that ***stable supplier,*** and Simon Storm saw, that is somebody to enter the co–operation with".

"the planners wanted some times that we took care of part of their job in tender contracts. We are, however, very *cautious and sensitive* about it, because these planners are important players in placing our projects ,also in other projects. Sometimes we are perceived as ***competitors*** [in the tender contracts].

S ← Em

Self–perception – Conversation

"I think we have not *communicated the ideology* and values of Humanist. Consequently Humanist has become a *firm of a small elite*".

S ←→ Con

Self–perception – Decision

"The group management had *decided* that our unit was not to enter the garden business, but to stick to being *a scissor company*. When our first garden cutter that started the reorientation of the company was developed, it was actually labelled as a technology project to pass the restriction."

S ←→ D

Strategy – Trigger

"our organizational strategy is that when a product *grows to a certain volume*, we reorganize the activity into a separate business unit".

Str → Tr

Strategy – Emotions

"we have had to *defend* our *strategy* to have in house tool development and manufacturing. There has been *scepticism* whether is makes sense to make it self and not to buy. It looks peripheral, but it is a vital part of the manufacturing and development process. That is why we have decided to stick to it"

Str ←→ Em

Strategy – Conversation, Decision

"The factory manager got fired. If he had had even one merit from the past his position has been stronger. Furthermore, he was not *humble* at all when *explaining* his strategy. Eventually the *decision* to fire him tipped over because of the personal *irritation* of his boss".

Str ←→ **Dec**

Establishment – Trigger

"Stig had *wanted* to do co–operation with our *former CEO*, but something happened and their relationship collapsed.

Establishment – Emotions

"it has been *heavier* than I have realized myself. It is *consuming* to fight with the *upper management*, who appear to have a slightly different agenda and short sighted".

Dialogue stream

Ideas – Dialogue [I–D]

Trigger – Wakening

"There has always been *talk about* what is the 'Humanist line'. But it has been difficult to e*xpress in words the meaning of it*. It is something that you feel on the tips of your fingers, perhaps when you worked for the company for many years. The starting point has been the Simon Storm functional *idea*, practical, honestly made of genuine materials".

W → T

Emotion – Wakening

"I had put my faith that these new owners ***looks promising;*** a person with ***distinct interest, financial possibilities,*** etc. But it turned out that the owners did not take the position like the past owners in the daily operations. I was *disappointed* on the new owners."

W → Em

Decision – Wakening

"when the ***design has been decided*** it rules pretty much how much the *product idea* will eventually cost".

"Alfred brings *ideas and thoughts*, but here is still the organization which develops the business and makes the ***daily decisions.*** Alfred is not engaged in the day–to–day."

"in the *idea creation* I would claim that the role of Adventurer Nordic has diminished; how *decision come about*; which seize of yachts and the brief of new products"

W → De

Conversation – Wakening

"we sensed there was a market gap, i.e. we did a product development project which was ***ten years ahead of its time*** which back fired, and then we *wondered why*".

"People in the super yachts have enormous experience of how to improve our product. And the more technical office is involved ***in the discussion,*** the more it enters in their mind, *next developed, solution* to take into consideration what the customer is really looking for. I see more and more investment of our traning is talking to the customer."

"it was RL who initiated the ***discussion*** about this seize and he wanted to proceed. But he was not really on our side, he gyred it so strongly in his *own direction of idea*, and it never became a deal with him".

W → Con

Trigger – Requirement

"We ***strived for*** as many existing designs, in order to have *tested solutions* for particular component shapes"

"you cannot ***aspire*** to serve everybody with one way of thinking of sailing a yacht. Our ***aspiration*** is and we are now more *flexible in understanding the use*".

"it has to do with racing, which creates ***interest*** and surely strengthens *our performance* value, that is, ***looking at*** what our yachts stand for today ***you see*** that they are *recognized* as much more *performing* yacht, *faster*, more *beautiful* yacht, not only *beautiful*"

"once we made a very *exotic space play ground*, which turned out to be a true ***challenge*** to plan"

Tr ← Req

Emotions – Requirement

"It has happened that Oscar has had a an ***aha–experience*** and come up with something *absolutely mad*, we have even rescheduled things"

"We are *afraid* that the ***individualistic needs grow,*** and the mid–segment declines which is our most own turf.

"ten years ago when people built houses they discovered two weeks before moving in that, dear me, we do not have bathroom furniture and we have run out of money. Then the preference goes to the ***cheapest,*** and *we hope* then it is our product they buy"

Em ←→ Req

Conversation – Requirement

"we have to really think that we know nothing and we have to *listen* to the people; we have to be open and flexible to accommodate different solutions and we have still **to apply our concept of *{technical} quality and safety* of the boat**"

"one who is ***participating*** is a man known in the security community for his extraordinary expertise, who is *with us* testing the product, the *security requirements*".

"I have in *co–operation* with IJ gone trough things; it is their responsibility to provide us enough complete products for manufacturing. I have the view of what is ***required of it to be produced it industrially".***

Con ←→ Req

Decision – Requirement

The single lever *tap decision* was made before I joined the company. Clearly, at that time in the 60:ies, 70:ies user analysis showed that *convenience* is a big sales argument".

"all our products, both the lock structure and the cylinders, are *approved* by the association of insurance companies. They have a classification for these products, that they meet the ***criteria,*** from there we come all these

security requirements"

"we had come to the right ***price/cost*** point with the ***right kind of a product,*** which *convinced* and then activated the sales organization in turn made their move" [requirement–decision]

De ← Req

Trigger – Evolution

"we ***tried*** to make functional improvements in the original Safety. I had good people and I said to them ***we got to*** have an invention in half a year. But it did not work out. But when *we looked trough* moulds, back ground materials, past patent applications we proceeded rapidly. There are two inventions behind this".

"some times *thoughts* and *ideas* come in wonderful ways. I think it is important—and the *challenge*—to ***create an milieu*** of some kind, which encourage and in some way collects all kinds of *initiatives*"

Ev ←→ **T**

Emotions – Evolution

"when you come from outside you look, *oh my goodness*, is that ***done like that.*** Besides you start to *see in different ways* and you understand, why it is *done like that*"

"in my opinion every room should be the home room of the human. Today I think the hotels, homes has turned into resembling hotels because we want to style our homes. We ***twist it the other way around,*** we bring the *home feeling into the hotel*."

"experience is actually a collection of failures. To be an experienced designer you have to *blunder yourself* enough many times, I use to say. A collection of ***right mistakes.*** I use to say to the boys 'do not *be afraid* to make mistakes now and then', because, god damn it, you remember. And next time you know how to build it"

Ev ←→ **Em**

Conversation – Evolution

"homes has turned into resembling hotels because we want to style our homes. We ***twist it the other way around,*** we bring the home feeling into the hotel. That is surely why *they bought* this case".

"we concluded that Eric and Jim would *start to* ***communicate;*** we give them a brief and they start to do. But Eric does not give much for *briefs*, it does not work that way, he *delivers every week arts*, out of which we may choose. He gets offended if we do not *qualify* anything. Hans works like an engineer, start to *develop for a need and a context, what is agreed*. Hans and Jim do not go together, apparently because they are competitors. That is Hans has a given reputation".

Ev ← **Con**

Decision – Evolution

"the American superiors are in the end who has the *final say* about the investment. In a way it is an external *test* to see if the idea survives"

"I have communicated *further development ideas* to improve the TechGear features. However, were *forced* to seek for cost reducing projects, to improve the odds of the product on the market"

Ev ←→ **De**

Emotions – Creations

"one conclusion was the move away from the Home House, an ***building drawn by Simon Storm,*** where also the show of Humanist was situated. It was like a *spiritual home and a emotional connection* to Simon Storm".

"*practical and functional furniture*, of genuine materials, and the overly artistic seek for effects does not go together with Humanist, rather the basic needs of the human, ***humanism*** well thought trough, well made"

C ←→ **Em**

Trigger – Creations

"we have an ***acute need*** to have in a year, because 2013 is not far away, to decide on the strategy; if we do not get the *patents now*, we have to start new rapidly. Then it means on the domestic market shifting more strongly to Sefey, until we have the *product generation* developed"

"*IJ* ***came along,*** and we were supposed to buy the management {*procedure*} *of product development* and we still buy it, paying a very high fee every month. But the delivery is stumbling."

"I have thrown there ***tens of ideas*** for further development. But *nothing happens*, you see, when it is not in the 'process' and not in the bonus scheme."

"actually, people *recognized an improvement* once they get hold of one, that here was ***solved something*** better than in the past".

C ← T

Conversation – Creations

"We have these grand old men business unit directors. They ***bring forward*** their ideas and I ***discuss*** a lot with them. When they do the implementation, they do it their own way. My thinking is that always when we have *spin–offs*, these old Guardian stars are in the lead."

"the more our designers are involved in the ***discussions,*** the more it enters in their mind, the next *developed solution* to take into consideration what the customer is really looking after"

C ← Con

Decision – Creations

"I came from an environment where *products developed* were founded on ***market research,*** knowing customer needs and technical aspects of it. There was a lot of expertise available and so the *project was started*". Here, Player Company was used to an CEO who travelled the world, contacts close to the customer interface, knew and understood it, what kind of opportunities existed, and based on that rather intuitively made a **sketch,** which rapidly was *decided* to put into realization".

"we concluded that we have to grow our electrical competence, in order for us to be able to make *products of the future*"

C ←→ De

APPENDIX F: TABLE OF BARRIERS PER CASE

Appendix F1: Case Plumber

Actor	Invention	Dialogue	Conditions	Product
Division of grand old man, grip will change Assemble diversity around the table Salespeople hard to find Only a few agents think 3 years ahead Architect, [installer or wholesaler] block User lack reference for innovations People become prisoners of their skills	Meaning of Thatcher vision One–person solutions Combination of design and faucet expensive and slow selling Out–of–scope initiative Neglect of recoding, updating in drawings Improvement ideas come from feedback; sometimes a tempest in a teapot	Long discussions leading nowhere between domestic, Germany, Norway Antagonism between domestic & Polish staff Dispute because of diversity Callback without traceability Disappointment from customer trials halted Face–to–face required when briefing Polish Belief fades when turnover lowers Engineer leave due to lack of feeling himself at home	Italian glamour, disconnection sales Globalization as Paris negotiation strangles grip Slippage from long–term to short–term biz Local interpretation & authorization of regulations Big thing to get message across in a rigid chain Bureaucracy stall	Electric not enough Faults and fuss of new products Private products Bulk component manufacturing Faults become costly

Appendix F2: Case Guardian

Actor	Invention	Dialogue	Conditions	Product
Failed 'electronic project' smoke out the autonomous activists	20–year cycle, only 10 years effective Need of contrasting key designs Ideas do not come by request and with the watch around its neck Electronic cylinder development too overwhelming complexity of requirements	Failure of decision–making process Alterations and exchange of information locally to factory	False vision of infrared technology Autonomy downside	Premature electric locking system Final configuration and installation is determined off site

Appendix F3: Case Gardener

Actor	Invention	Dialogue	Conditions	Product
Retirement and succession of the Grand Old Man Entrepreneurship with working life at stake Oscar Wood fired a few times Jean Putman fired a few times Painful leadership conditions Firing of factory manager in early days of new technology Lack of track record rendered no personal good will in a fatal situation Too close to each other; married couple parallel No worker forces towards automation No passionate salesperson is barrier to sales	First garden cutter without authorization masked as a technology project Entry into USA trough the 'back door passing the hierarchy Innovation always carries a personal risk First deal a '1S' merely with a prototype of first time and technical '1S' idea Disastrous risks delivering production run product Plans are overrun in case of a good idea When idea shown and sold, the patience and time is lost for proper planning Planning time range extends with increased automation Breaking in of a new product hits the productivity on short term Challenge designing products reducing seconds in manufacturing and labor Economic judgment stalls new product projects	Visiting practices between factories did not include 'internal sales' Leaking information past the hierarchy Informal dialogue with the board passing and embarrassing the US establishment Third– or fourth–hand feedback chain from the final buyer US language vs. local language Differences is time range of US agenda vs. factory's agenda	Superior emotions and irritation fatal for arbitrary behavior 40% decline in the 1980s Past range of products gave company no future Group role limitation to scissors, not garden cutters Lack of legitimacy entering a new business area Head office profit quarter agenda Too many factories, questioning of existence Questioning of strategic tool making in–house Order–driven management tendency Management culture driven by bonus Conservative target setting dissonant with requirements for investments Sister company mission US group company garden biz antagonism European reporting office 1–2 years tenure of sister company's management Turbulence in the top management Hierarchical division of labor between marketing and R&D New you management discontinues the past team work? Chinese low wage impact Disloyalty as Chinese plagiarism	Labor–intensive products are not competitive Failed garden furniture project misinterpretation of strategic meaning Customer opposition versus Chinese–produced products Walmart creates passage for hard discount product

Appendix F4: Case Adventurer

Actor	Invention	Dialogue	Conditions	Product
'We do not live our products' Leading user 'high personality' minds Indirectness of chief designer Inexperience of drafts men Retirement of experienced builder coaches Idle builders	Customization Non–proven solutions Time scarcity for 'design for manufacturing' '70% complete solutions' Too many projects; no time to recapitulate Absence of time between prototype to production run' Laboratory test & reality gap failure	Three Exodus 66 prototype decision Disrespect of yacht managers Distrust and misunderstandings	Attitude disbelief between MD and staff Project managing implementation profitably does not work Localization of Exodus 32 prototype in Estonia	Rudder failure Unknown material properties Timing of product mix Less production friendly yachts

Appendix F5: Case Humanist

Actor	Invention	Dialogue	Conditions	Product
Missing of architect Storm and his associates Management team of novices Margot Bergh dominance and opinion leadership Creative director Jim Fix lack of general conception of firm, and hence the framing of the products Jim Fix owner and other interests Investor owner Joe Cutter distant and not in the picture Holding company chair Charles Azema distanced by the hierarchy Holding company CEO Dick Card personality consuming, and bad influence over Jim Fix Rivalry between designers Under qualified trainees Agent give weak contribution, out of control Skeptical old loyalist club	Protection of designs from copiers difficult Development much UK driven UK detached and own ideas International view does not support exports of Storm range Initialization hazy Pencil Aided Design Under qualified samples Inability to design living spaces Evolution of design to finished on its own. Undertaking done on weak premises, hurry, and without testing People get boared at things taking 12 moths Prototype showing embarrassment Chair fixation of designer Deliverables stuck	Weak support from owners Lost personal associations of Simon Storm Broken dialogue btw. chairman and designer, misunderstanding Operational mgmt team not fully in the picture and on top of situation Superficial conception of core ideology and lack of substance R&D not do not understand the ideology Language, UK cultural view Ambiguity of team talks Difficulty to get into the firm Disbelief in each other Poor persistence to make change happen Excess of meeting intensity to get information going	Owner presence receded; reflecting an anonymous furniture firm with as investment company as owner Distant and impair roles of establishment and owner Foundation resist change Mission has been preserving the legacy High turnover of CEO Old culture collide with new comers Lack of established strategy Focus on living space, comfort instead of products not materialized Humanist Studio disconnected and role Owner strategy junior professionals Lack of international structure 20% growth excess pressure consume focus of the organization	Old design trap Current product range mainly from 1930–40 Product range not sellable internationally Narrow product range Incomplete product shows Talking substitutes new products Glossy expose substitute lack of product Big picture of product range is lacking Scope mere on pieces of furniture or living space Product have inbuilt feelings and meanings lost Excess customization give operational hardship

Appendix F6: Case Player

Actor	Invention	Dialogue	Conditions	Product
Retired entrepreneur hold back spiritual successors Civilized conflict between process and order driven CEO and impulsive owner/ chairperson Sharp contrast in back ground of CEO and founder Project manager abdication in the middle of the project Role switching difficulties Too many people around the table of the vast number of committees Secondary occupation strategy New generation of designers not familiar with the manufacturing process Dominant Alfred Lindman When the top management change lead always to change of R&D staff Sales division directors are novices Subsidiary leadership skills a bottleneck	Too many projects, too few commercial successes TechGear project progress after 3 year a concern Dragging initiatives financially consuming Convergence of 'three generation meeting point' and 'intelligent learning environment vague Product idea definition difficulty, due to not experience and unheard of idea Software technology discussion inferior to traditional functional design Brand beauty product development Long tail of warranty cost of the mobile 2000 Marginal volume share of Style, Club projects 400 improvement list on nuts and bolts level Initialization of new ideas open conflict Project start on impulse or investigation Initialization too rigid, starting from 'writing'	Formality of Marketing task force, Management team, Work committee, R&D committee Disbelief hits the dialogue from time to time when confronting hardships Terminology confusion Conflicting sales arguments btw wood and metal designs Ambiguity where is decided and by whom Meetings tend to be two man show of chairperson and CEO Own remarks are received like shouting to the wall. Dissonance between owner and CEO make R&D manager role difficult Owner passes the hierarchy with initiatives Production 'shoot down fanatic ideas' and appreciate current increase of order Dialogue not constructive with subsidiaries; lack of mutual confidence	Absence of project management culture Local culture barriers for elderly being in a play ground park Wood or metal strategy connected to the location and ethos of the firm Different opinion concerning the product launch and the geographical launch strategy Founder ambiguity against the rational of metal range Historical neglect of R&D for the benefit of dividend take outs by the owners Strategic road map of NPD improductive Neglect of the underperforming new products by the management. Firm credibility at stake due to product faults at the beginning of tenure. Power struggle between loss making subsidiaries and strategy of marketing function Maturity of market lead to conflict between subsidiaries and marketing. Weak leadership role of marketing stalls conceptual NPD The firm being a family company limits the measures available when needed by the MD	Chip in the wood fixation versus functional fixation Different opinions of interpretation of the conceptual ethos of TechGear Choice between wood or aluminum Unsettled functionality of the concept Too high price product? Product concept sales dependent of broad penetration Window–dressing products without sales ambitions Product faults cause conflict between subsidiaries and parent company New product cannibalizing old range prevents new products from growing

APPENDIX G: LIST OF CHARACTERS INTERVIEWED, OTHERS OF REFERENCE

Case ***Player***	Person	Position	Years of service
Interviewed	*Andrew Illman*	*chairman, founder*	*over 10 years*
	Joe Slocum	*CEO*	*less than 5 years*
	Jonathan Sanders	*project manager*	*less than 10 years*
	Tim Upman	*sales director*	*10 years*
	Peter Newman	*production director*	*NA*
	John Sinclair	*R&D manager*	*less than 5 years*
Other key persons	Heidi Hybner	marketing manager	*10 years*
	Arthur Niederman	area sales director	*less than 5 years*
	Rainer Westman	*specialist*	*1 year*

Case ***Plumber***	Person	Position	Years of service
Interviewed	*Jack Straw*	*CEO*	*over 10 years*
	Roger Islander	*technology director*	*Over 10 years*
	Josef Steelman	*project manager*	*over 10 years*
	Peter Wood	*marketing director*	*less than 5 years*
Other key persons	Pat Ryder	former CEO	over 10 years
	Archie Angel	partner	less than 5 years

Case ***Adventurer***	Person	Position	Years of service
Interviewed	*Schon Mitechell*	*CEO*	*less than 5 years*
	Kieth Eeast	*technical director*	*more than 10 years*
	George Edwards	*production manager*	*more than 10 years*
Other key persons	George Beawer	chief designer	more than 10 years
	Earnst Young	marketing director	less than 10 years
	Leroy Fredman	owner	less than 10 years
	Luca Reynolds	former CEO	10 years
	Teo Todd	division director	less than 5 years
	Ouden West	project manger	more than 10 years
	Peter Paul	founder, ex. owner	NA
	Lucifer Lanchaster	1st customer	NA
	Clayton Paul	racing professional	NA
	Niel Hardy	technical specialist	NA
	Adrian Heigho	chief designer (retired)	NA
	Smith and Jones	chief designers (retired)	NA

Case ***Humanist***	Person	Position	Years of service
Interviewed	*Margot Bergh*	*CEO*	*less than 5 years*
	Igor Bold	*operations manager*	*less than 5 years*
	Kaj Swan	*sales director*	*less than 5 years*
	Kim Bergh	*product manager*	*less than 5 years*
	Bart Shooter	*design director (retired)*	*more than 10 years*
Other key persons	Jim Fix	chief designer	less than 5 years
	Simon Storm	chief designer (retired)	more than 10 years
	Eric	designer	less than 5 years
	Hans	designer	less than 5 years
	Dick Cayard	CEO holding company	less than 5 years
	Charles Azema	Chair; holding company	NA
	Joe Cutter	main owner	less than 10 years

Case ***Gardener***	Person	Position	Years of service
Interviewed	*Jean Putman*	*CEO*	*more than 10 years*
	Oscar Wood	*R&D director*	*more than 10 years*
	Steve Richards	*Production director*	*more than 10 years*
Other key persons	Berth Hyde	US sales executive	more than 10 years

Case ***Guardian***	Person	Position	Years of service
Interviewed	*Mathew White*	*CEO*	*more than 10 years*
	Kim Strong	*VP Construction Lock*	*more than 10 years*
	Jacob Evans	*Project Manager*	*more than 10 years*

Innovation research is missing midrange research programs. In this midrange research, the time perspective should be much longer than in the usual analysis of innovation projects, i.e., 10 to 15 years. The research of Torkel Tallqvist lays the ground for such a midrange research program.

This book looks at repetitively innovative companies that have already reached a certain level of maturity—so they are not only driven by the founder, his or her ideas, competencies, networks, and leadership style—but are also increasingly influenced by structures, systems and processes that have been created and implemented by a management team that has 'professionalized' innovation management.

"… analysis really underlines the pivotal forces of promotors with hierarchical power and those with expert power—which have been the central actors of Witte's two power–center theory. The difference between Witte's analysis and this analysis is that Witte looked at the project level, whereas Torkel Tallqvist looks at the firm level—and he does this 40 years later. However, it is not the differences in the objects, historical and cultural setting that is remarkable—it is the fact that both studies show very similar empirical results."

"This exploratory and confirmative research is a very fascinating one. It is not only done in a really good way—you can also observe how a person who has been a top manager and innovation activist before, now becomes a deeply involved scholarly researcher who very carefully identifies not only the structure of the mindsets and the activities of the interviewed innovation managers, but also their struggles with opportunities and dependencies. What comes out are really new and fresh views adding new insights in a field of innovation research that already has a long–term research tradition, where many believed that everything has already been found."

Prof. Dr. Hans Georg Gemünden, Technische Universität Berlin, January 2009

"… this soundly grounded, very original piece of research has produced many valuable findings on a topic that continues and will continue to receive much attention."

Prof. Krzysztof Markowski, ESIEE (Ecole Supérieure d'Ingénieurs en Electronique et Electrotechnique) Engineering, January 2009

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