

Strategic Design and Innovation -- Rules of the Game, Pathways to Success

Antti Ainamo
IASM, University of Turku
Publicum building
20014 University of Turku, Finland
aaainamo@utu.fi
☎ +358-2-333 8894

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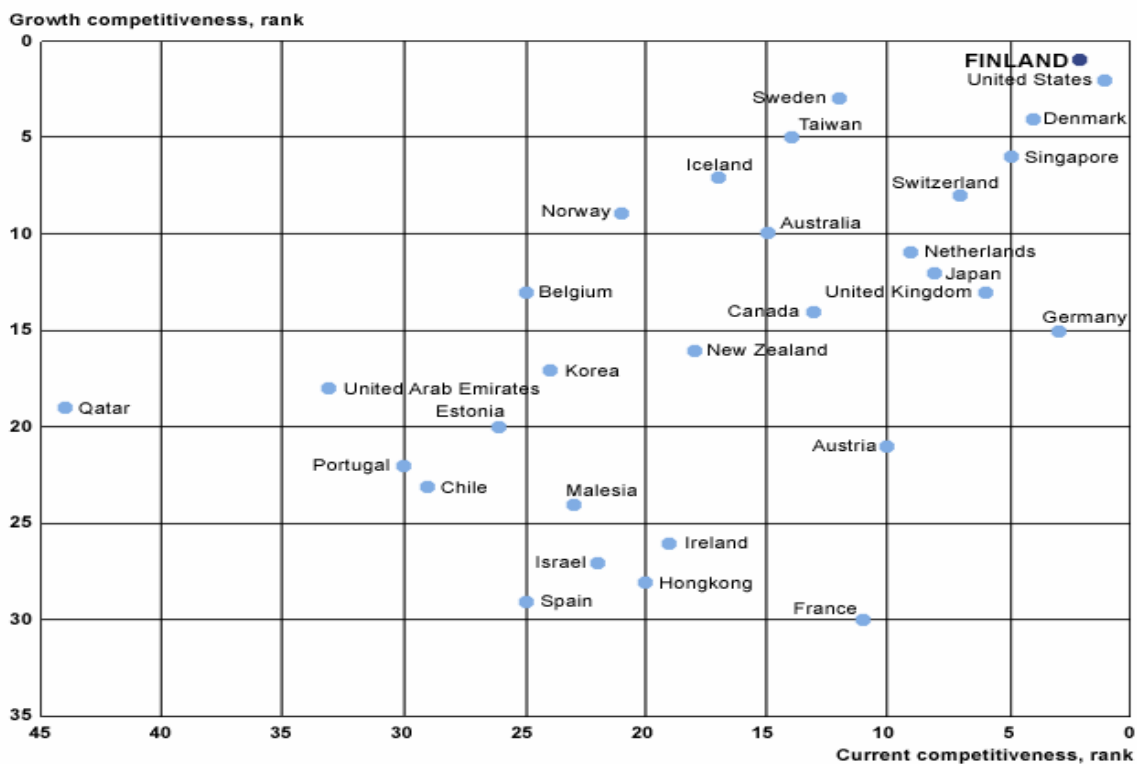
INTRODUCTION

Finland is one of the countries in which institutions of the state have been giving out research funding and institutions of research in universities and industrial laboratories taking in such funding have for more than two decades collaborated in a drive for “*innovation*”. In response to a presumed shortage of innovation in the national economy in terms of new products, services, and business concepts, the representatives of the state and those of design research agreed in the 1990s that design, or the fuzzy front end of a development process, was to be both a generator of and promotion mechanism for processes with a goal to develop new products, services, technology, marketing, organization, business, strategy, or all of the above.¹ The two key ideas that emerged to orient Finnish design research were, first, to increase the use of design in Finnish firms and, second, to develop at least 10 Finnish internationally competitive design consultancies. Indeed, in the 21st century, Finland has been credited as being the most competitive and innovative country in the world. Given that design was built into a part of Finland’s national strategy or policy in 1990s and there were investments to drive those in policies in the form of design promotion, design research and the professionalization of design, the rise in Finland’s institutional capacity for innovation and competitiveness (Figure 1) has been widely credited to design.

While the above kind of surge in Finland’s position in charts concerning national competitiveness and innovation is without a doubt impressive, we believe that outcomes such a rise in statistical rank of the country vis-à-vis the ranks of other countries should not be automatically the central and only focus for design researchers. We believe that a researcher that leans on statistical evidence without

¹ *Design 2005!: Industrial design technology programme* by the Academy of Finland and by Tekes, and other such publicly funded research projects, have focused on design as a generator and accelerator of innovation.

Figure 1. Finland as the world's most competitive country in 2005.²



consideration of the underlying causes for the competitiveness would remind of the parable of Mark Twain of the drunk who used a lamppost to lean on rather than for illumination. Elsewhere, we have inquired into the professionalization of industrial design in serving to align the interests of industrial designers and the policy makers of the state in Finland (Valtonen and Ainamo 2007, Ainamo 2007a). Here, from the perspective of similar intellectual curiosity to ask *why*, inspired by the research of Carliss Baldwin and Kim Clark of MIT on design rules, this paper takes as its focus that “rules rather than outcomes should be the central focus of inquiry.” (Brennan and Buchanan 2000).

Within this perspective of design rules, this paper focuses on design promotion, research, profession, and innovation in the perspective of individual strategic managers in individual companies, considering this as a legitimate topics for scientific inquiry from the perspective of the strategic manager who is accountable for his decisions and attitudes, as they relate to not only design but on all kinds of dimensions, from profit to the well-being of his or her employees. Rather than

² WEF World Economic Forum 2005, confer, for example, Tekes, *The competitiveness of Finland: Current competitiveness and growth competitiveness* [http://www.research.fi/en/performance/the_competitiveness_of_finland, accessed 03/28/2008 by the author]

considering design as a something akin to religion that can well be argued to be beyond criticism, this paper is written in the spirit of the sciences of the artificial (Simon 1982). The paper will study research on design at multiple but complementary levels of analysis and from multiple vantage points; that is, what many strategic managers and policy makers will call “general design principles related to organizations, products, and services”, “mechanism design”, and “institutional design”. The study presented in this paper is an exploratory one, based on a methodology to operationalize the above foci of interest to provide a new intellectually stimulating and potentially useful, and meaningful frame of reference. The study builds on and draws from access to strategic managers, designers, and innovation researchers to present research findings about design, innovation, and competitiveness. The methodology is one of ethnographic study and historical and comparative case study of (different kinds of) firms and managers using design as a strategic tool. The goal is to crystallize where there is more than one pathway by which design can lead to competitiveness and, if so, whether there are tradeoffs or dilemmas involved in trying to choose or follow one pathway and not another. The study is empathic to strategic managers and company s as users of design, on the one hand, and as clients of design consultancies, on the other hand, in specifying the rules of the game using design as a strategic tool to enhance innovation and competitiveness.

REVIEW OF RESEARCH LITERATURE

There are many kinds of artificial phenomena on which research literature on design has been interested. These include: 1. product design and development in an engineering perspective; 2. a strategic perspective to organization and knowledge management, and 3. an evolutionary perspective on economic, social or cultural change. In the first instance of the above instances, “design” in research literature in the engineering sciences has been defined as the fuzzy front end of the product, service, business, or organizational development. This definition has allowed for more than level of design in the organization, as well as more than viewpoint who is the key designer. In the second instance, in organization and management theory, ”strategic design” has been defined as the strategic-level design of the rules of the game which creative players such as product designers in the

organization are expected to follow or respect. In the third instance, research on political economy has underlined that “institutional design” can be said to represent major change by definition that is oriented to revolution and upsetting of the dominant economic, political and order, whereas “institutional reform” will replicate or evolve such dominant order.

At a higher level of abstraction, “product and service design”, “mechanism design” and “institutional design”, above, link very validly with three strong paradigms in general research approaches related to innovation:³ *general design theory*, *mechanism design*, and *neo-institutional economics*. In the first instance, following Herbert Simon, the Nobel Laureate, we take it that what many may consider as good design outcomes are often paradoxically as much a result of long-term developments as they are of intelligent planning. Simon uses architecture as his example in this context. Many design researchers agree that Simon’s general theory of design is valid for applications in many contexts of design, including product and service design. Also many researchers have shown that a public or other such change agent may have a role to play in ascertaining the direction and pace of change.

According to literature on mechanism design, an agent of change in a company such as strategic manager cannot fully ascertain the direction or the pace for reasons such as path-dependence and institutional differences across national or other cultural contexts. Following Leonid Hurwicz, a most recent Nobel laureate, the efforts of an agent, evolutionary path dependency, and guiding forces provided by cultural institutions may jointly represent a central “message center” that will influence how rules are created and sustained. Any agent embedded in the system will be prone to go with “the flow” of the messages, and the rules they help to evolve, provided there are no interests or messages that will conflict the message. For all practical purposes, he or she will appear to be altruistic.

According to Douglas North, yet another Nobel laureate, rule enforcement introduces a another pertinent dimension to the economic game in addition to formal and informal rules, especially in cases

³ The paper both builds on and aims toward articles in refereed international periodicals, and thus repair a pertinent shortcoming – lack of refereed international articles in periodicals in most of Finnish design research funded from the late 1990s (see Tekes 2006)

where messages and interests are not all in perfect harmony (cf. Brennan and Buchanan 2000). In other words, the effects of both formal and informal rules may be amplified or mitigated by enforcement or lack thereof, regardless of the particular artifact at play. North stresses that informal rules are as important from the perspective of what are the outcomes as are formal rules. Enforcement or lack thereof of both informal and formal rules will matter in terms of stability or change in the system, for example. Worth note is that formal rules, informal rules, enforcement of formal rules, and enforcement of informal rules may not affect the actions of the players in an economic game along pathways that would be precisely the same.

Within this emerging frame of reference – a blend of general design theory, mechanism design and neo-institutional economics -- the best change agent will be one that will proactively react to foreseeable changes in rules and their enforcement, as well as will without delay react to changes that emerge. As Georg von Wright has argued, the result will be “co-evolution” of the organization and its rule and rule-enforcement environments. Following Andrew B. Hargadon (and Douglas 2001), the best change agent will be one that will proactively react to foreseeable changes in rules and their enforcement, as well as will without delay react to changes that emerge unexpectedly.

From design project to program, reform, and design

As Henry Mintzberg has famously quipped, strategic management was from the mid-1960s to the mid-1970s very biased in terms of what he calls “design”. Strategic management was ‘top down’ so that the role of middle management, for example, was to sort out the tactics how to get subordinates to do work assigned to them. This view is still living and doing well, even if it has taken new shape in terms of underlying that “strategic design” on the part of strategic management ought to take the form “framing” and “infrastructure”, rather than dictate all possible details (Nadler and Tushman 1988, Fairhurst and Sarr 1995, Nordfors, Ventresca, Uskali, Hargadon et al. 2006).

Since the 1980s it has been clear, however, that much of strategic management is necessarily emergent or silent so that strategic management can often only by hindsight infer a pattern of behavior as strategy (Hargadon & Sutton 2001, Phillips 1997, Mintzberg & Dumas 1991, Gorb & Dumas 1987;

see also North 2005, Hurwicz 1973). Top-down and the bottom-up views of management are simplifications of reality. Globalization and professional and transnational social networks make organizations increasingly similar in terms of their rules, function, or appearance (DiMaggio & Powell 1983, Meyer and Rowan 1977). Divergence below the surface is persistent, company-specific, and often quite complex, embedded in processes that Ikajiru Nonaka has called "up-down-middle" (Nonaka & Takeuchi 1995). Top management makes real strategic choices but these choices relate less to choosing what is the firm's market, business, or task environment, and more to the ways that middle management is encouraged to coordinate innovation or exploitation. New concepts are proposed from various directions to strategic management, which concepts, propositions and process of proposition are coordinated by middle management, and mixed and matched by top management (Seidel 2007, Aaltonen, 2007) via major strategic decision, emergent paths of small decisions, or one or another kind of communication.

This paper aims to describe the strategic management of design in a company in a way where these descriptions can be compared, elaborated, and generalized into more than one kind of a process model or ideal type, depending on the kind of task or other kind of environment at hand. The purpose is to create new knowledge about why and how to organize design processes in, at the boundary or fully outside the company, as well as to relate how such strategies relate to innovation, commercialization, and business success: for example, why, how, when to organize design as a project, and when have long-term solution? The goal is to document, well-researched knowledge about best practices, to provide teaching material for student and executive education, for purposes of knowledge dissemination in the professions, industry, trade, and broadly in the economy, and society

RESEARCH QUESTION AND METHODOLOGY

The research question in this paper, formally stated, is: Why and how does strategic design relate to innovation in a company? For purposes of specification of mechanisms that lead to outcomes and generalization across such mechanisms, the above research question is approached from the bottom up with the help of three subordinate research questions:

- a. Why and how strategic (product/service) design relates to product or service design in the specific contexts of particular companies, and/or vice versa?
- b. Why and how strategic (organization) design relates to product and service innovation in the specific contexts of particular companies, and/or vice versa?
- c. Why and how strategic (institutional) design relates to product and service innovation in the specific contexts of particular companies, and/or vice versa?

This kind of a bottom-up process of inquiry has blended more than one kind of research approach to answer the above research questions. It has blended product design and development literature in the administrative and engineering sciences (Hargadon and Sutton 1997, Wheelwright and Clark 1992), strategy research (Mintzberg 1990, Hardy et al., 2000, Hargadon and Sutton 2001), and neo-institutional economics in the social sciences (Hurwicz, North), for purposes of productive blending of description and explanation (in the model of Stinchcombe 1998). In terms of "1)", above, research literature has already shown why and how top managerial elite has for some time "exploited" the working, the creative, or any other class subordinated to them (March 1991, Ainamo 1996, North 2005, Nyström & Starbuck 1988). This is a feasible strategic solution as long as the 'bank is not to be emptied'. Exploitation is ethically and in practice acceptable when the elite is dependent on those that it exploits, which serves to maintain the interests of the exploiter and the exploited in balance (Olson 2000). This kind of inquiry is still only in its infancy; yet, seminal inroads to language have been made in making working mechanisms transparent (Margolin 1988; and, in at least one case, personalized, see Falay et al. 2007)

The aim is to find research settings that are comparative across temporal and spatial dimensions and to take into account differences in mentality, pace of change, etc., across national and cultures in firms or markets such as those in Germany, Japan, China, the U.S., Russia (cf. Djelic and Ainamo 1999, 2005). Based on such discussions, archival work according to the historical method, and modeling of mental of the strategic managers and the business models of firms they manage, understanding about performance, the rules of the game, and the specific mechanisms in terms of strategic design and innovation can be specified (cf. North 2005; Djelic and Ainamo 2005, 1999; Hurwicz 1973). The formal propositions generated from application of the above frame can be

compared with ethnographic understandings, practices and language of strategic managers and designers and with case studies of the firms that these managers steer. The requirement for organizing the process of exploitation is that the long-term nature of governance relationship should be transparent for those being exploited (Olson), and adaptive to changes in the economic, social and political environment (North 2005, Hargadon and Douglas 2001, Form Function Finland 1996).

The assumption here is that a strategic manager in a firm will be more prone to discuss with a researcher that will appear to work by the same set of institutional (national, cultural, professional, business, etc. language) rules. They will be willing and able to discuss how they are aware of, have interest in, make choices about, as well as think and act in practice, when it comes to the rules of the game in terms of design, innovation, and performance. In turn, specification of the processes and rules that appear to have led to competitive outcomes ought to result in a higher chance of repetition of success, avoidance of failure, and improvement of success than otherwise. The research setting ought to be robust and in thus in part adaptive and emergent, given interaction with designers and strategic managers.

In the same spirit as Antonio Capaldo's work, the research process here brokers knowledge from participating managers and designers to researchers, and between researchers. The framework developed in this paper, above, is suited for understanding why and how some companies breed successful particular kinds of design-based innovation while others do not, as well as why some of the successful organizations have encores, while others do not. The paper helps to crystallize what research gaps exist in terms of design research remain even after the paper and what kinds of new research approaches may be developed to fill such gaps.

The role of world-class literature in books and refereed articles in international journals is here one of a boundary object in the interaction and research processes to produce new knowledge that is critical and pragmatic in terms of how strategic managers in companies may meet the challenge of what they call "strategic design" differently, depending on what they understand by the concept.

The framework of this study was intended to alleviate earlier design research in Finland, for example, funded by the Academy of Finland and by Tekes, that has been characterized so that "the results are not [yet] at the international top level" (Tekes 2006, p. 83, translated by the author),

”[m]ost striking is that refereed articles in international periodicals number so few”, (ibid.), ”firms do not have structures to take in design knowledge” (ibid. p. 88) and ”design consultancies... do not have the competences to provide advice in developing their practices or structures” (ibid.).

THE STUDY

This paper is based on ethnographic and case studies of (different kinds of) firms and managers using design as a strategic tool to unbundle this stance of the strategic managers with which these discussions were had; this study builds on and draws from access to strategic managers, designers, and innovation researchers (Appendix A). The core data for the paper was selected on the basis of access to a group of business and other organizations (contact persons in brackets), a list that included also a few companies that the author is not at liberty to name here. Three companies using design were selected as the core cases, using the personal contacts of one of the author; one of the cases is not named in Appendix A.

Each organization provided access to project managers and key employees from marketing, engineering, and design to one or several new product development projects, to some the coordination mechanisms, or both. To avoid having only very similar (especially only very successful) design projects included in the sample, we specifically focused on studying companies that had had design projects that differed in terms of (1) their level of newness to the firm and the marketplace; (2) their market performance, if known; and (3) the division or business unit in which they were developed. Our intention was not to describe the operations of the three companies as such (even though we done our best to do so), but to develop these three cases into ‘ideal types’. Next, we first report on the commonalties across the three cases or ideal types, and then move on to the differences.

COMMON RULES OF THE GAME ABOUT DESIGN AMONG THE MANAGERS

While all of the strategic managers accepted that design probably is good for the competitiveness of a company in many instances, a fact that must be supported also by much research literature (e.g.

Falay et al. 2007, Ainamo & Pantzar 2000, Gorb & Dumas 1987; studies which the strategic managers did not know), design was *not* a solution to many of the specific strategic challenges that they face (a fact echoed in some research, e.g. Ainamo 2007, Ainamo 2002, Ainamo 1996, Mintzberg 1990; see also Korvenmaa 1998). What the strategic managers needed was design research that would directly relate to the specific strategic challenges that they believed that the organizations they were managers faced. For them, product, service and business development challenges, generally, go hand in hand with a lack of relevant experience on which to build. To overcome this challenge, the strategic managers identified as critical to have a consultant or researcher that served as “face [person]” or liason with them; someone who had sufficient work experience in industry to speak the same language as they do and is a legitimate player also in the design community (i.e. has awards, is known, or is a design, innovation or marketing professor or researcher a with legitimate stream of research publications on topics that appear relevant to design).

The strategic managers were well aware that the legitimacy of a particular kind of experience in terms of design, managerial attitude, or research publication will vary in time. In Finland, for example, the ‘dot.com’ boom and bust at the turn of the millennium happened in Finland with high and low interests in innovation made Sonera, a.k.a. Telecom Finland, a model for many innovative firms in Finland in the late 1990s. Then, Sonera got carried away: it over-invested 3rd generation mobile telephony in Germany -- and ended up as part of Swedish Telia. All Finnish firms focused on curtailing their innovation and on rationalizing their operations after the dot.com bubble burst. New innovative concepts withered. Then, from about 2006, the institutions of the state and trade and industrial associations reacted to the apparent lack of innovation, and made calls for revitalization of innovation efforts. The Academy of Finland and Tekes invested money in opening doors to world-class universities around the world. Success in spreading awareness and use of design was largely successful (Valtonen 2007, Ainamo 2007b, Valtonen and Ainamo 2007) and many of the goals and objectives of Finnish investments in design have been met, these strategic managers nonetheless still believed that design is *not* a solution to all innovation and strategic challenges *across all possible*

circumstances.⁴ What was important was to have consultants or researchers who had experience of “action”. Whether the particular design or managerial attitude was in vogue or not did not matter; the belief is that experience of “action” will remain valuable and that such experience will be inherently scarce because “most consultants just talk” and “most researchers just read books”.

When the strategic managers heard from the author of this paper that there was high-quality research network to address these issues (see Appendix B), they were impressed. However, they still pressed for research that would be “directly useful”. If not, the state authorities through research funding agencies such as Tekes and the Academy of Finland would have to pay the bill.

Companies differ in why and how they use design, a fact covered in the next section. Yet, the strategic managers tended to agree that the basics for design as strategic tool according to the informants included making a distinction between open and closed innovation, knowing the range of alternatives that have long existed, and understanding what new forms of mechanisms exist, which translates into being able to link various strategic options into what can be portrayed as one or another kind of a design matrix.

The strategic managers knew that any particular function such as product design or marketing, for example, is not universal panacea. A marketing-led model tends to incur time lags, and truly works well when the market situation is rather stable. When very new kinds of products must be conceptualized, there is need for product design; when new products are not needed, there is less need for product design. Given these realities, the managers were interested in discussing (a) how different types of products influence inter-functional interactions and interdependencies, (b) what kind of coordination mechanisms are at play, and (c) why one or another kind of language and attitude is called for.

Many of the strategic managers believed that some form of a modern “design attitude” (Boland and Collopy 2004, see e.g. Ainamo 2007b for a review) was needed. Marketing maybe open, participative and efficient, given that market information is gathered directly from customers, rather than from a small group of designers representing users in market development and innovation a

⁴ These two ideas have sidestepped the fact that while there is indeed supporting evidence to back the argument that design is good for business performance, there are also research findings

design-led model or a small group of sales people representing customers in a sales-led model of technology development and innovation.

The strategic managers were very well aware about the generic rules whereby organizations are designed. They were aware of the fact that to make functional decisions, to separate some kinds of work and resource from another that were incompatible, organizations have long relied vertical “silos”; to communicate openly across functional decisions, work and resources from another, organizations have long relied lateral linkages. These organizational structures are commonly known as “functional structures” and “participative structures”. When the required attitude is one of analysis, planning, decision, and control, this calls for an attitude of deciding what to do and moving from analysis to “doing”. For such purposes, having people in silos can be good. Most people in a silo will know that the obvious direction in which to move in a silo is up, which collective insight will result in concerted action.

When the challenge is to create wholly new kinds of products or services, the spirit of the game is different. There is a need to open up new ways of envisioning and to generate new ideas for the future, or what the research literature has called a “design attitude” (Boland and Collopy 2004). This attitude will involve a game were appreciating all kinds of innovations: how new products or services can interfunctional interactions and interdependencies, how communication is structured for open innovation, and how success is ultimately a question of framing – an attitude by which the desired kind of future is socially constructed and made happen.

A design attitude benefits from, even requires, lateral linkage devices and structural coordination mechanisms, but sometimes these are not possible to create, given the systemic nature of a business enterprise whereby all of the devices and mechanisms in the companies tend to “hang together”. Strategy is ultimately about making choices between one kind of an innovation system and another. Specialization means that one becomes better at one game versus another. As even amateurs of a sport like soccer will know, it is not feasible to play soccer in ice hockey gear: there are tradeoffs between doing one thing and doing another. This said, there may exist various ways to organize design as a part of the overall organizational structure.

Organizational structures from the perspectives of creativity and innovation in the organizations that we analyzed can be grouped into mechanistic and authoritarian, complex, and design-oriented organizational structures. Some organizational structures are not designed for innovation but for something else and these may thus hamper a design attitude, product or service design, and innovation: a well-tuned basic production process; a plentitude of formal, informal rules, and how these are enforced; specialization in terms of who might be a (design) liason and who is not; and integration managers who do not have much influence but would like to have such influence.

In considering organizational structures such as a temporary task force or a matrix structure, these sometimes add up to possibilities for creative play, sometimes they do not. A matrix or task forces tends to be quite a complex organizational structure which is why it can sometimes buffer creative ideas from enforcement of bureaucratic rules that are intended to keep the system “together”. The bureaucrats in a highly complicated web of organizational relationships in a matrix structure simply do not always have resources to keep designers at bay. In other words, those who have a design attitude involving organic creation of new forms are decoupled from those with attitudes towards “doing” or implementation or “making the important decisions”.

Design teams, and design centers tend to promote a design attitude. Design teams are usually self-governing and have great authority at least internally. The design team is typically the part of the organization which strategic management has positioned in the organization structure where the most creative part of the product development process is carried out.

Besides organizational structures dedicated or not dedicated to foster a design attitude, there may be other mechanisms to spread a design attitude or to control its spread. When strategic management desires to share information about design across functional boundaries, there is a need for an informal atmosphere in the organization and, accordingly, the rules of the game will tend to be informal rules. The limit to such sharing is that, at the extreme, the complexity of informal communication patterns, participative decision-making, and consensual conflict resolution can be much more time consuming and less efficient than more centralized and bureaucratic processes. The designers “have to understand I am stupid” is a rule of communication that one strategic manager spreads among her subordinates.

When strategic management desires to keep some specific piece of information secret, there is a need for social closure atmosphere in the organization and, accordingly, the rules of the game will tend to be formal rules and they will be strictly enforced. The limit to such secrecy is that, at the extreme, the rigidity of formal communication patterns, mechanistic decision-making, and centralized conflict resolution can be much more time consuming and less efficient than more decentralized and organic processes. In other words, informal rules of the game and creativity tend to work best when the tasks at hand with which designers work is framed as not a complicated undertaking and talk about scaling up the solution are kept to a minimum; formal rules of the game and authority tend to work best when the tasks at hand with which designers work is framed as a complicated undertaking and there are design about scaling up the solution but, for whatever reason, the timing of such scaling is “not now”.

If something that is complex is finally “scaled up” or implemented in new work or use environments, the complexity of brokering the new practice, service, or social innovation into a new context is controlled by identifying what might be the interfaces of the innovation and crafting them into interfaces that resemble the interfaces of the product, service or practice that the innovation intends to replace. Thus, the intended users or adopters of the innovation will feel they have some form of experience with the old practice, service or practice. This will make it easier for them to adopt something new, if its resemblance with the old is as large as possible. Individuals will encounter greater difficulty, take longer, and be more conservative in their adoption, if they feel they lack previous experience with an innovation. With the right kind of a process, the process of adoption maybe sped up. The right kind of a process is here usually one that relies on institutionalized practices and ways of use and requires no new rules and no new means of enforcement.

This said, humans are the kind of social animals that will appreciate the occasional and small novelty in their lives, to have something to think about and to talk about with others. The best innovation will be the one that will be launched with a low profile and will take off with a fast exponential curve, “out of nowhere”. If there is a demand and opportunity to introduce an innovation, the heuristic is such that a task will be all the more easy the less transfer of specialized information, specialized expertise or specialized resources is needed to support the launch. What to watch out for is

“a hole in the chain” and that is supposed to connect one “silo” to another to the effect that “the structure breaks apart”.

DIFFERENT RULES OF THE GAME, DIFFERENT GAMES

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Table 1. Rules of the game and pathways in strategic design and innovation

| | | | |
|---|--|--|---|
| | Enforcement of informal rules: <i>Large telecommunications firm</i> | Informal rules: <i>Mid-sized engineering consulting firm</i> | Informal rules: <i>Small and medium sized textile and fashion firm</i> |
| Design teams | Projects and programs that cut across functions and even cultures | Engineering-led cross-functional projects | Designer-led and marketing-led cross-functional projects |
| Design centers. | Finland (country of origin), US, China, etc. | Finland (country of origin) | Finland (country of origin) |
| Matrix structures | Technology, product-group based divisions | Customer-group and technology-based teams | Product-group and functional specializations |
| Temporary task forces | Division-level development programs | Training programs for project managers, sales | Training programs for distributors |
| Integrating managers | Chairman, CEO, divisional heads | Corporate finance manager, CEO | Owner-manager, Board of directors |
| Individual liaisons | Corporate specialists, divisional program managers, etc. | Divisional heads, b-unit managers, team leaders | Owner-manager, functional directors |
| Bureaucratic control/hierarchical directives | Revolving strategic process driven by technology insights, tempered by design and marketing insights | Sales budgets on how engineer should sell an array of services to focused target markets | Owner-manager and Board of directors have financial monitors on marketing, etc. |
| Sports analog on the basis of rules of the game followed | Billiards: Pocketing balls into “goals” that can – and often do -- number more than one. | Table tennis: Rapid-fire interaction with few and simple rules | Bowling: Attempts to strike as many pins as possible with heavy strikes that are kept as few as possible |

CONCLUSIONS

Much of even research literature on design has assumed that creative, design and innovation are a “one size fits all” strategy for increased competitiveness. In contrast, this study strengthens earlier findings that when a strategic managers or the potential customers of the companies which these managers lead are relatively unfamiliar and have little previous experience with a new product concept, designing the concept and bringing it to market are more difficult and challenging than when the design project involves a more straightforward modification or extension of an existing line. The study establishes distinction between product concepts, product components, and the complexity or simplicity that these are configured arguing that, from a design perspective, there is not much of a difference in a strategic perspective, whether it is the user or the company that has or has not the required level of experience. In this respect, the paper argues that this is a genuine commonality across different (kinds of) companies and different (kinds of) products.

The paper also finds that there can be very important strategic differences in how to use design strategically in one company versus another. Some companies, such as the textile and fashion company we studied, can afford to invest in design that will affect the core mechanisms of their operations and try to come with new “classic” products very seldom. Hence, while they may very innovative in terms of their product design, they will be much more conservative in terms of their service design, business design, strategy, or brand positioning. For these kinds of companies, we argue, the design business is like bowling: the rules of the game is that one does get rewarded for sending off heavy balls one after another in rapid succession.

Other companies, such as our engineering consulting company that was also studied in this paper are just the opposite. This kind of a company is a design broker. The ideal is to immediately and always send back a good idea that is received in a way where more balls go out that are not returned. The rules in this game resemble those of table tennis.

Still other companies, such as the telecommunications company that was also studied in this paper, are design brokers of a different kind. The ideal is to conceptualize the ideas that exist, to

identify purposes or functions for these ideas, to in fact exhaust uses for these ideas, and then to start a new game. The rules in this game resemble those of billiards.

Know-how and competence on innovation just as know-how and competence in anything are systemic. There are tradeoffs, even if there few dilemmas (there usually are dilemmas, also). If nothing else, the good team player – whether athlete, manager, or designer – will run out of time even when she would otherwise successfully be able to do everything. A jack of all trades is a master of one. We believe this proverb goes for sports and for the design business alike. We call for more research on different kinds of innovation systems, tradeoffs and possible synergies in terms of making choices between systems, and commonalities and differences in rules of the game.

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Appendix A

BUSINESS AND OTHER ORGANIZATIONS STUDIED (CONTACT PERSONS)

Design Forum, design promotional agency (Mikko Kalhama), Helsinki, Finland

Ed design, design consultancy (Tapani Hyvönen), Turku, Finland

Hasan & Partners, advertising agency, and their clients (Ami Hasan), Helsinki, Finland

School of Economics, marketing department (prof. Arto Lindblom), Helsinki, Finland

IDBM – International Design Business Management Programme (Markku Salimäki,

Toni-Matti Karjalainen), Helsinki, Finland

Kesko (Dr. Lasse Mitronen), Helsinki, Finland

Luovi / Design partners (Kari Korkman), Helsinki, Finland

Marimekko Oyj (Kirsi Räikkönen), Helsinki, Finland

Nokia Corporate Design (Eero Miettinen, Anna Valtonen), Helsinki, Finland

Nokia Multimedia (Marianne Antola in Espoo), Espoo, Finland

Nokia Siemens Networks (Jussi Tuurnala), Helsinki, Finland

Technology industry Finland (Mervi Sibakov), Helsinki, Finland

Statistics Finland (Aku Alanen), Helsinki, Finland

Others (confidential)

Appendix A

STRADI RESEARCH PROJECT

Strategic design and innovation (STRADI) is a research project that has been based on ethnographic and case study of different kinds of firms using design as a competitive tool. It builds on close contacts both with an international network of world-class design researchers and with Finnish strategic managers. STRADI will produce articles in refereed international periodicals, and thus repair a pertinent shortcoming – lack of refereed international articles in periodicals in most of Finnish design research funded from the late 1990s (Tekes 2006). STRADI also serves to add in a group of new researchers into the Finnish design research scene that were not funded in *Design 2005!*. STRADI is based on open doors to many of these universities. Within this context, a lack of funding of serious design research will serve as a signal to world-class researchers that Finnish institutions giving out research funding are not interested in maintaining the doors open that have been opened. Even when design experts at institutions such as Tekes acknowledge the dangers of "leaking business secrets abroad" (Viemerö 2007), Finnish strategic managers understand that information and knowledge gain in value when they are shared, rather than losing value.

Appendix B

EXPECTED RESULTS AND TIME TABLE

(1) Firm-specific process descriptions that can be compared, elaborated, and generalized into more than one kind of a process model, depending on the kind of task or other kind of environment at hand.

(2) New knowledge about why and how to organize design process in or outside the firm

(3) New knowledge about why and how design is related to innovation, commercialization and business success

(4.) Why, how, when to organize design as a project, and when have long-term solution

The first results of this research process are presented at the DMI event in Paris.

TIME TABLE

1. Preparation Sept 2007 to Aug 2008, with the first publications already coming out.

2. This central research project Sept 2008 to August 2009.

3. Completion (more publications in the pipeline), Sept 2009 to Aug 2011

Curriculum vitae

ANTTI AINAMO

Professor of innovation, technology and science policy, UTU IASM, 2006-2011,

Chairman, Finnish Society for Science and Technology Studies, 2007-

Academic visitor (Designing for Services in Science-based Industries, Innovation Journalism), University of Oxford Saïd Business School, 2006-2007,

Visiting scholar, Hopkins MS of Stanford U. for studies in ecology/evolution, 2007 (1 month)

Visiting scholar, Stanford University, <http://crgp.stanford.edu>, www.scancor.org, www.innovationjournalism.org (15 mths)

Docent (Adjunct professor), 2002 – present, University of Art and Design Helsinki (UIAH)

Docent (Adjunct Professor), 2000 - present, HSE Dept. of Marketing and Management

Academy of Finland postdoctoral research, 1997-2000

Visiting Researcher, 1994-1996, London Business School, IBM/World Class Manufacturing Project, Centre for Design Management <http://www.lbs.ac.uk>

1990-1993 Lecturer, Industrial Economics and Marketing at Finnish design institutions

SELECTED PUBLICATIONS:

TEMPORARY FORMS OF ORGANIZING, DESIGN, FASHION, GLOBALIZATION, ETC.

Roessler, D., M. Fink, S. Kraus, S. Hänninen, A. Ainamo (2008): "Managing Uncertainty in the Marketing of New-Technology Products", *Int. J. Technological Intelligence and Planning*, 4, 114-129.

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