

The Strategic Management of Innovation in SMEs: A Multiple Case Study Approach in Switzerland

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Abstract

This study seeks to examine the process of strategic management of innovation within SMEs with particular focus on the decision process of entrepreneurs who lead such companies. From a strategic perspective, innovation can be understood as a rent seeking activity, which results from the volume, the rate of margin, and the length of the innovation. Drawing on eight case studies from Eastern and Central Switzerland, we show that the potential rent of an innovation results from the volume, the rate of margin, and the length of the innovation. The industry and the capital intensity of the production process also influence the rent configuration. However, and contrary to the general assumption, small firms do not necessarily prefer rent configurations with small volumes. Considering the relationship between rent configuration and innovation management process, it can generally be assumed that sound innovation management process is associated with a favorable rent configuration.

Introduction

The contribution of small and medium-sized enterprises (SMEs) to innovation and overall economic growth has been repeatedly demonstrated through empirical research (Acs, 1999). However, the vast majority of studies dealing with innovation processes refers to large companies or to SMEs with a high-tech background (Bhaskaran, 2006; Akgün, Lynn & Byrne, 2004). “Most of what is written about innovation either focuses on the hottest new start-up or the sleeping giant who suddenly awakened. Rarely do stories of established SMEs in traditional industries make headlines with their managerial activities”. (Blumentritt, 2004). This lack of research interest in established SMEs from a “low-tech” background is particularly striking when we consider the importance of the SME sector in the economy. For instance, SMEs account for 99.7% of the companies and employ almost 70% of the workforce in Switzerland.

In order to contribute to a deeper understanding of innovation in SMEs, this study takes a broad approach by including enterprises from various industries. We focus our attention on three questions: how SMEs make strategic innovation decisions, how they assess potential risk-return profiles of future innovations, and how the innovation management process is structured. Empirical evidence is based on a series of eight case studies about SMEs from the German-speaking part of Switzerland. This study is part of an international research project which seeks to examine the strategic management of innovation within SMEs, with particular focus on the decision making of the entrepreneurs who lead such companies.

1. Review of the literature

Van de Ven (1986) defines innovation as “the development and implementation of new ideas by people who over time engage in transactions with others within an institutional context”. This definition is sufficiently general to apply to a wide variety of technical, product, process, and administrative kinds of innovations. Therefore, it is possible to identify five types of innovations:

1. *Product or service innovation*: Product or service innovation denotes a change in the product a company makes or the service it provides (Tushman & Nadler, 1986).
2. *Market development innovation*: A market development innovation describes the process of addressing new customers with existing or new products or services. For instance, tapping a new geographical market through the export of existing products can be qualified as market development innovation.
3. *Marketing innovations*: Significantly new approaches to the marketing of products or services can be characterized as innovation activities. Examples for marketing innovations are the use of new distribution channels or the development of new brands.
4. *Process innovation*: Process innovation is a change in the way a product is made or the service provided (Tushman & Nadler, 1986).
5. *Administrative innovations*: Administrative innovations comprise new institutional policies, structures, or systems. Some prominent examples of administrative innovations are strategic planning units, T-groups, joint ventures, matrix structures or quality circles (Abrahamson, 1991). An administrative innovation does not immediately result in a new or improved product or service but it influences the introduction or production process (Kimberly & Evanisko, 1981).

Innovation could be an important source of competitive advantage (Porter, 1996) and therefore directly influence the survival of a firm in the marketplace. SMEs especially need to think about their business strategically, since they cannot “succeed on brute force, throwing resources at problems” (Porter, 1991). Decisions about the commercialization of strategic innovations are normally made by the company’s board or at least significantly influenced by it. Since strategic innovations determine future profitability of the firm and frequently require significant resource commitment, the innovation decision is directly related to the company’s existence. In order to protect competitive advantages resulting from strategic innovation, firms try to create isolating mechanisms which prevent others from competing for a given market opportunity and appropriate the rents associated with it (Alvarez & Barney, 2004; Rumelt, 1984).

1.1 Innovation as a rent-seeking activity

A strategic perspective on innovation is taken in this study. Strategy aims at the establishment of sustainable, distinctive competitive advantage which, in turn, is precondition for rent appropriation (McGrath, Tsai, Venkatamaran & McMillan, 1996). In other words, strategic management focuses on capturing rents, i.e. on the capturing of excess profits that do not immediately induce a competitive response (McGrath, 1997; Mahoney & Pandian, 1992).

Rent can be defined as returns that “arise from the existence, discovery, and successful commercial exploitation of entrepreneurial opportunities” and are “in excess of the opportunity costs of all resources used” (Miles et al., 2003). Accordingly, entrepreneurial rents are all residual returns exceeding “normal” returns (i.e. returns that would pay all factors of production). All types of innovation are generally suitable to capture rents: for instance, product innovation can generate more value and there-

fore command higher prices. Similarly, organizational innovation can lead to reduced fixed costs or to the development of new markets and higher sales (Miles et al., 2003).

Firms seek opportunities to capture rents which exist because of competitive imperfections in factor or product markets (Barney, 1986a; Alvarez & Barney, 2004). Market imperfections are, for instance, a result of technology or demand changes or they are created purposely by individuals (Schumpeter, 1934; Kirzner, 1973). In order to exploit those imperfections successfully, three conditions must be fulfilled: the firm must possess the rare knowledge about the rent-generating opportunities associated with a particular competitive imperfection, it must dispose of the resource endowment necessary to take advantage of this opportunity and it must find a way to appropriate some of the rents (Alvarez & Barney, 2004). Even if a firm knows about a rent-generating opportunity and has the resources to make use of it, competitors and other market forces can erode the firm's appropriable rent. Existing opportunities to create and capture rents will cause entrepreneurial competition, influencing the longevity of a product's market position through imitation and innovation of other firms (Miles et al., 2003). The ability of the firm or entrepreneur to sustain a product's competitive position will depend on the protection of intellectual property rights and deterrence of new entrants.

1.2 Determining the potential rent of an innovation

According to Santi et al. (2003), the potential rent of an innovation results from the volume (potential annual sales), the rate of margin (average rate of profit), and the length of the innovation (duration of the life cycle of the innovation).

The volume is determined by four "indicators": the potential of sector diffusion, the potential of geographic diffusion, the limits to exploitation and the size of the user markets (Santi et al., 2003). The indicator sector diffusion aims at estimating the spectrum of potential applications in different market segments (application dimension) whereas, the indicator geographic diffusion refers to the spatial area in which the innovation will be commercialized (spatial dimension). The third factor, limitations to exploitation, refers to possibly not accessible geographic markets or market segments due to patents already in place or other preclusive criteria. The fourth indicator, size of user markets, combines the preceding indicators by measuring the average annual sales which are generated in all market segments and geographic areas accessible.

The rate of profit is determined by three indicators: the process of generation of the innovation, the type of innovation and the kind of prior protection. If the process of generation takes place in close cooperation with suppliers, research institutions, customers or other factors, Santi et al. (2003) assume a favorable effect on the rate of profit as long as measures are taken to secure the confidentiality of the innovation and to protect the intellectual property associated with it. Furthermore, the type of innovation will influence the rate of profit potentially generable: incremental vs. radical, isolated vs. integrated into a system and substitution vs. creation of new market (Abernathy & Utterback, 1978; Henderson & Clark, 1990) are the relevant distinctions impacting the innovation profitability according to Santi et al. (2003). The third indicator, the kind of prior protection, relates to the ability of the firm to protect its intellectual property. If the innovation is really new and there is no prior intellectual property claim on it, the entrepreneur will be able to protect it and capture the associated rents.

The lifetime of the innovation depends on the technology used and the ease to copy this technology. If the technological basis of the innovation rests upon fundamental research requiring extensive research efforts, the innovation will tend to have a long life cycle. In contrast, if the innovation is

based on applied research and does not require major research work, its length of lifetime will be limited. The technical ease to copy will also determine the probability and speed of competitive imitation. The less transparent the innovation (because of technological complexity and specific know-how), the more difficult it is to access the knowledge inherent in the innovation. The ability to patent the technology and to enforce the patent effectively will further increase the lifetime of the innovation.

1.3 The innovation process in SMEs

SMEs differ significantly from large companies as to how business is conducted, operations managed and strategies formulated: “a small business is not a little big business” (Welsh & White, 1981). One of the most frequently mentioned attributes of SME is their resource scarcity (Huang, Soutar & Brown, 2002; Blumentritt, 2004; Aragòn-Sánchez & Sánchez-Marín, 2005). Generally, key resource constraints comprise shortage of labor or physical inputs, shortage of finance, lack of suitable investment opportunities and insufficient managerial capacity (Mahoney & Pandian, 1992). The resource poverty of SMEs lead to a higher vulnerability to mistakes and variations in their economic performance (Martin & Staines, 1994). As Blumentritt (2004) notes: “one major misstep could have dire consequences for firms with little financial slack”.

Another characteristic of a SME concerns organizational differences in terms of structures, processes and responsibility. SMEs have management structures which differ from those of large companies (Acs et al., 1994; Rothwell, 1989) by having less bureaucracy and flatter management structures (Bhaskaran, 2006). Decision-making is less formalized and often rests with a small group of people. Particularly in family-owned firms, decision-making processes are significantly influenced by the owner-manager and contingent on his personality (Bhaskaran, 2006).

These key characteristics also influence innovation management processes in SMEs. Acs et al. (1994) suggests that the less hierarchical and bureaucratic management structures in SMEs can result in an innovative advantage, at least in certain industries. In large firms, innovation decisions must survive bureaucratic resistance and risk aversion is inherent in rigid structures, whereas in SMEs the innovation decision is made in an environment free of bureaucratic constraints. Furthermore, the organizational atmosphere in SMEs is beneficial to creative work: lines of communication are shorter, there is a more direct interaction between the enterprise and its customers and there are no fixed reward and control structures stifling creativity (Wijnberg, 1990).

Empirical findings suggest that formal planning is of minor importance in SMEs. Small firms rarely engage in “large company techniques” like formal planning and rather use informal management practices. When planning and control techniques are used, they usually involve short time horizons and are informal, irregular and incomprehensive (Martin & Staines, 1994). The rational weighting of different options and the decision for one of them based on comprehensive collection and analysis of information can even be disadvantageous. “In fact, too much analysis can be harmful, by the time an opportunity is investigated fully, it may no longer exist” (Bhide, 1994).

2. Methodology

This study is part of an international research program coordinated by Graduate Business School at the University of Western Australia and the Groupe ESC Dijon in France. A multiple case study method is used. This methodology is particularly recommended to examine many issues across many cases and

avoid chance associations (Eisenhardt, 1991). Theory can be both developed and tested using multiple case study approaches (Yin, 1989; Eisenhardt, 1989).

Each case study is based on a 15 section-questionnaire administered face-to-face and on an in-depth interview with owner-managers of SMEs. The questionnaire has two purposes: (1) it is a data collection method for the research project; and (2) it is a strategic screening to help the owner-manager to correctly assess the anticipated value of the innovation and the erosion effects it will face when it is launched on the market. The questionnaire was developed with an Excel spreadsheet program and, after a certain number of sections are completed, it produces a report of the rent configuration or of the innovation management process. The reports are a diagnostic tool, which will also serve in the subsequent interview.

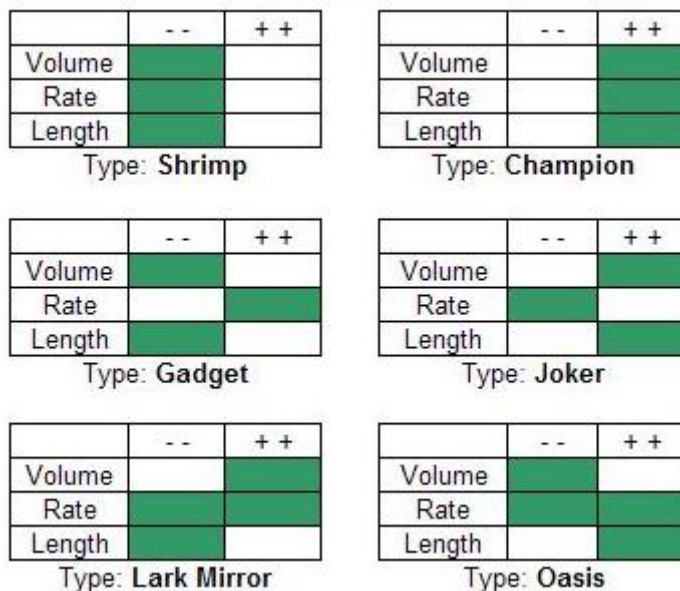
2.1 Measurement

Drawing on Santi's approach (2003), we considered that the potential rent of an innovation results from three main components:

- volume (sales likely to be generated over one year);
- rate of margin (profits likely to be generated from an innovation);
- length (duration or a life cycle of an innovation).

Assuming that every component has two possible variables, one can get eight combinations of these variables. There are six rent profiles defined and used in the survey (Figure 1).

Figure 1: The six rent configurations



Within these six configurations, the “Champion” configuration appears to be the most desirable. However, the “Oasis” configuration appears to be the most suitable for small firms because of the small sales volume. Since small firms typically lack extensive resource endowments, it is anticipated that they would strive for “Oasis” innovations. This configuration shows favorable characteristics in terms

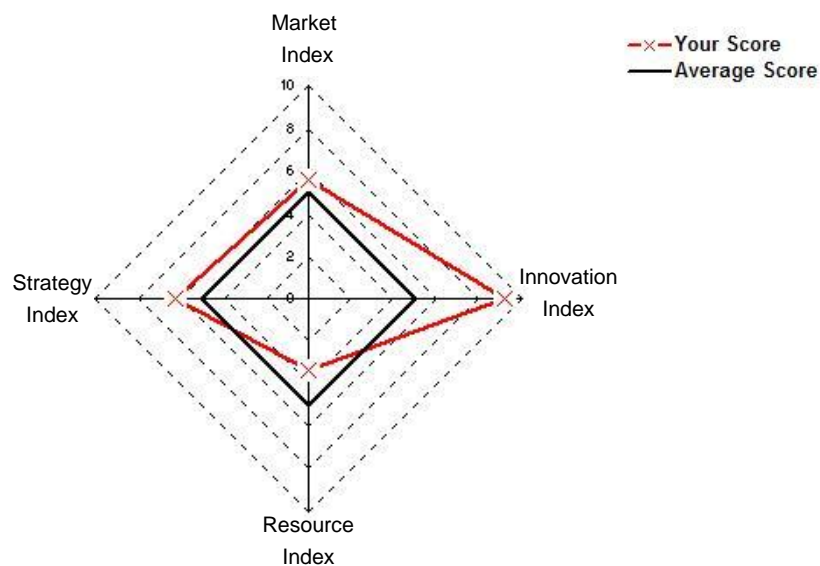
of profit rate and length in combination with rather small volumes. In contrast, “Lark Mirror”, “Joker” and “Champion” configurations are characterized by high volumes which “may not be followed easily by small firms with limited capacity to commit to such production” (Reboud & Mazzarol, 2003). The least attractive configuration is the “Shrimp” configuration with low values regarding all three components. The “Gadget” differs from the “Shrimp” only in the higher rate of profit. The short length and the high volumes of the “Gadget” induce the innovator to adopt a “take the money and run strategy.” (Reboud & Mazzarol, 2003).

In addition to the estimation of the potential return an entrepreneur might yield from an innovation, there remains the need for the development of an effective business model to fully commercialize the innovation (Akgun, Lynn & Byrne, 2004). To address this problem, a four part framework was developed that seeks to measure the SME owner-manager's current approach to innovation management, mapping behavior on four dimensions (Mazzarol & Reboud, 2006):

1. *Market index* – a measure of the firm's focus on customer needs and how the new innovation offers customers value for money.
2. *Innovation index* – a measure of the firm's formal process of new product development, and its management of intellectual property.
3. *Resources index* – a measure of the firm's technological, human, financial and managerial resources.
4. *Strategy index* – a measure of the firm's strategic planning in relation to its commercialization process.

Each index comprises a total of ten items that are scored by the owner-managers undertaking the survey. Scores could range from 0 to 10, with 5 being the average for each of the four indexes. The four dimensions form a "diagnostic diamond" depicted in figure 2.

Figure 2: The diagnostic diamond



2.2 Sample and data collection method

A series of eight interviews with SME owner-managers were conducted for this study. The sample was selected from a small business population with high levels of innovation and commercialization activity, existing track records of trading history and well defined product portfolios. The eight SMEs are located in Central and Eastern Switzerland and they come from a broad range of industries in order to allow inter-industry comparisons. Their number of employees varies between 10 and 150.

In order to enhance the reliability and validity of the data, the output generated by the diagnostic questionnaire (rent profile and diagnostic diamond) was discussed with the respondents immediately in order to validate the results. Through this, respondents were given the opportunity to check the conclusions drawn by the researcher and express any suggestions or amendments to it.

3. Results

This section outlines the findings for each company. After a brief overview of the company, we analyze how strategic innovation decisions are made, what is the rent profile for future innovations, and how the innovation management process is structured.

3.1 Software Ltd

Software Ltd was founded in 1982 and is a private limited company. The company currently employs 23 people. The company has three subsidiaries in Switzerland as well as a software development center in Bratislava. Its product portfolio comprises software solutions for car dealers and garages. Software Ltd offers complete software solutions for authorized car and motorcycle dealers including tools for customer relationship management and warehousing, OEM-interfaces. Software Ltd introduced 6 to 10 innovations in the last three years and invests up to 30% of its annual turnover in innovations. The main focus of the innovation activities are product and service innovations (61-80%), followed by process technology innovations (21-40%).

The factors considered as most important for innovation success or failure can be grouped under three headings: customers, competitors and cooperation with external business partners. Customers are considered as the most important group influencing the success or failure of an innovation: their general attitude toward innovation, their needs, their ability to see the benefits provided by the innovation, their willingness to switch to an alternative product or service as well as the bargaining power of leading customers were ranked as important or very important with respect to the success or failure of an innovation.

Software Ltd plans to commercialize a technological product innovation which can work alone without integration in a system and is compatible with existing products and processes. The three determinants of the innovation's rent profile, potential volume, potential rate of profit and potential length of lifetime, are favorable resulting in a "Champion" configuration with high potential rent. It is anticipated that the innovation will have a high potential sales volume combined with medium to high gross and net profitability. With respect to the market impact of the innovation, it will potentially "create a new market by creating a new dominant design". The only potential weakness of the innovation seems to be the easy imitability by competitors.

Overall, Software Ltd shows a well developed diagnostic diamond: the financial and human resources necessary for the commercialization of the innovation seem to be available internally (Resource Index), the company seems to closely cooperate with customers during the innovation process

(Market Index) and the internal steering of the innovation process is well structured (Innovation Index). However, the company seems to lack a formal approach to innovation management process: a formal process for new product development exists “more or less” and the company does not have a formal, written business plan. The major challenges for Software Ltd are: to recognize customer needs (market dimension), find enough qualified employees (resource dimension), new technologies (innovation dimension) and the maintenance of sound relationships with OEMs/importers (strategy dimension).

3.2 Wood Floor Ltd

Wood Floor Ltd is a wholesaler of wood floors located near Lake Zurich. The company has been established for 12 years and currently employs 10 people. Its annual sales grew continuously over the past years to CHF 10m in 2006. It can be considered an innovative company, introducing 10 innovations into markets over the past three years with market development innovations and marketing innovations playing the most important role (21-40% of the innovations). Measured as percentage of sales, the company invests up to 5% of annual sales into innovative activities.

For the next three years, Wood Floor Ltd plans a market innovation which will be developed in cooperation with key suppliers. This innovation aims to create a new market and it will be compatible with existing products and processes. With high potential sales volumes, low profit rates and a rather short length of lifetime, this rent configuration can be characterized as “Lark Mirror”. Since this innovation involves the development of a new geographical market (the French-speaking part of Switzerland), the geographical diffusion and potential sales volume was estimated as rather high. The configuration “Lark Mirror” can impose major challenges on the firm in terms of capital outlay required to secure returns over the short life cycle. Furthermore, Wood Floor Ltd faces much bigger competitors in its sector, which leads to further erosion of innovation rents.

The innovation management process at Wood Floor Ltd is formally structured and the generation of new innovations is internally perceived as a major focus of the firm. The relatively low score of the Innovation index results from the lack of legal protection through patents and the infrequent use of confidentiality agreements. Because of the nature of the wholesale business, patent protection and confidentiality agreements are rather uncommon protection measures, especially for market development and marketing innovations. Hence, it is not surprising that Wood Floor Ltd mentioned imitation as the most important and speed as the second most important strategic challenge. When legal measures like patents or contracts (e.g. non-disclosure agreements) are not applicable or enforceable, speed can be an appropriate protection from competitive imitation: shorter time-to-market can constitute a source of competitive advantage not easily imitable by others.

3.3 Ribbons Ltd

Ribbons Ltd was founded in 1914. The company produces ribbons for multiple purposes: the five product lines comprise all types of ribbons from high quality decoration ribbons in a broad variety of designs to tapes for technical applications. Ribbons Ltd currently employs 130 people. Even though the family-owned company does not disclose sales numbers, it can be assumed that the company experiences remarkable growth as the workforce increased by 20% since 2003, which can be traced back to its international expansion. About 90% of the production is exported. Ribbons Ltd can be considered a highly innovative company since more than 10 innovations were introduced to the market in the last

three years. Most of those innovations are product innovations (41-60%) while marketing and process innovations account for 21-40% each.

In the next three years, Ribbons Ltd plans to commercialize a product innovation which involves changes in technological processes. This innovation will be applicable independently and will be compatible with other products or services. It will be generated in cooperation with key suppliers and will be capable of creating a new market. The predicted annual sales after three years for this innovation range between €400'000 and €600'000. Its geographical diffusion is estimated as medium and its diffusion within market segments as limited. Regarding the profit margin of this innovation, a gross profitability of about 21-40% and a net profitability between 11% and 20 % is predicted. The length of lifetime is determined by a technology which is hard to copy. The diagnostic questionnaire qualifies this configuration as "Champion" even though the profitability seems to be rather low and the market diffusion reaches only intermediate values.

However, the innovation management process at Ribbons Ltd shows some weaknesses in the internal steering of the commercialization process. The comparably lower score of the innovation index is partly due to a lack of effort to protect the innovation from imitation. There is currently no formal intellectual property strategy in the company. In fact, the main protection relies on trade secrets and additional legal protection is perceived as redundant.

3.4 Telecom Service Ltd

Telecom Service Ltd is a small service firm for telecommunications companies founded in 2001. Its service portfolio encompasses planning, implementation and maintenance services for operators of mobile telecommunications networks. Telecom Service Ltd is a fast-growing company which increased its turnover from CHF 1.4 m to CHF 3.8 m in the past three years. With 6-10 innovations commercialized in the past three years and investments in innovations of around 10% of annual sales, Telecom Service Ltd can be considered a highly innovative company. The majority of those innovations were process technology innovations (41-60%) followed by service innovations (21-40%).

The technological product innovation Telecom Service Ltd is planning to commercialize soon will be generated in cooperation with key customers and will be an improvement of existing products. Its potential annual sales volume after three years will range between CHF 600,000 and CHF 800,000. The geographical diffusion is estimated as rather limited and the diffusion within market segments as medium. The potential profitability of this innovation ranges between 21-40% (gross profitability) and 11-20% (net profitability). However, the innovation has the ability to create a new design which could become dominant. The innovation will be rather easy to copy by competitors which negatively influences the predicted length of lifetime. The rent configuration of this innovation was identified as a "Lark Mirror".

This rent configuration is characterized by high volume and may not be easily pursued by small firms with limited production capacity. In addition, this rent configuration might look attractive at first glance since additional sales give the impression of a fast-growing company. However, the short duration of the rents could imply that resources which are necessary in the beginning might become redundant when the innovation comes to the end of its life cycle. A service company like Telecom Service Ltd would possibly have to recruit new staff which had to be laid off after only a few years or months. The low profitability of the innovation is partially due to the market structure. The discussion with the owner-manager revealed that there is only a limited number of big customers buying Telecom Service

Ltd's services. This implies that customers possess a high negotiation power, thereby eroding the rent that can be extracted from the innovation.

Although all dimensions of the innovation process show evenly high scores and no dimension is particularly weak, some shortcomings can be identified. For instance, the internal planning process seems to follow a rather unstructured, informal approach and no business plan is formulated. Another weakness is the lack of effort put into the protection of the innovation from competitive imitation: ideas are not kept secret through non-disclosure agreements.

3.5 Publishing Ltd

Publishing Ltd is a small publishing company for B2B magazines located in Zurich. Its product portfolio comprises two trade journals for automation and production technology. The company has been established for 74 years and currently employs 21 people. Its current annual gross turnover amounts to CHF 9m and 3% of the turnover is invested in innovation activities. The company operates in an industry significantly affected by the increasing importance of new information and communication technologies: advertising expenditures are reallocated from print to online advertising, and information becomes readily and freely available on the internet.

The innovation planned for the near future possesses a rather weak rent profile. This rent configuration is called "Shrimp" due to its low volume, low rate of profit and short length of product life cycle. With a limited geographic diffusion, only CHF 200,000 estimated sales after three years, and a poor diffusion within market segments, the overall potential sales volume is low. Thin margins (less than 20% gross profitability) and the easy copiability by competitors complete the overall poor configuration. This rent configuration clearly reflects the intense competition in the industry which was discussed before. Substitution products, a shrinking market, decreasing entry barriers and direct competitors are the key determinants eroding the rent potential.

The innovation management process at Publishing Ltd shows a considerable weakness with regard to the internal steering of the commercialization. There is no formal process for new product development, outside assistance is needed for the development of a prototype, the innovation has not been tested independently, there is little effort made to protect the innovation or keep it confidential and the prior experience of commercialization is very limited within the organization. As shown in *Figure 1*, the innovation index reaches only a low score (4.0) compared to other dimensions of the innovation management process.

In contrast, the strategy index reaches a considerably high score (8.67). Altogether, the diagnostic diamond casts some doubt on Publishing Ltd's ability to commercialize the planned innovation. If a policy requiring the managers to examine all aspects of a planned innovation would exist, the diagnostic diamond would have a more balanced profile.

3.6 Building Services Ltd

Building Services Ltd is a small company from the construction industry located in St. Gallen. Its main product, "Buildingtec", is a technology for the design, manufacturing and installation of steel reinforcement in concrete slabs, floors, and walls. With 30% of annual sales, Building Services Ltd dedicates a surprisingly high share of its resources to innovation activities. In the next three years, the company plans to commercialize 6-10 innovations, mainly consisting of product or service innovations.

The innovation project currently developed by Building Services is a “Lark Mirror”, characterized by high volumes, low profit rates and a short length of lifetime. The high potential sales volumes result from a very high potential geographic diffusion, estimated annual sales of more than €800,000 and a very wide diffusion within market segments. Because Building Services Ltd is responsible for the worldwide distribution of the licenses for the reinforcement technology, this assessment seems to be very plausible. However, gross profitability (lower than 20%) is rather poor and the easy imitability limits the innovation’s life cycle.

The diagnostic diamond of Building Services Ltd depicted in *Figure 1* shows high values regarding the innovation index and resource index while the market index and strategy index are underdeveloped. With respect to the market index, the discussion of questionnaire items made clear that the low score partially stems from the fact that Building Services Ltd claims to already know the customer. For instance, the compatibility with existing technologies or systems was not examined because, in the opinion of owner-manager, the innovation could be integrated in all existing systems. Similarly, it was argued that the customer’s ability to test the innovation prior to the purchase was not researched because it is not possible to test it. Therefore, prior beliefs about the customer substituted a thorough analysis of the customer’s needs. With regard to the strategy index, the main weaknesses encompass the poor assessment of potential competitors' reaction to the commercialization of the innovation, the insufficient evaluation of potential threats and the absence of a comprehensive financial model.

3.7 Machinery Ltd

Machinery Ltd is a private limited company which has been established for 22 years. The company is an engineering company producing machines and parts in the area of post press processing of newspapers and magazines. It assembles technology for conveying, storing, bundling and packaging of newspapers. The innovation activities of Machinery Ltd of the last three years were mainly focused on product innovations: they account for the majority of innovations commercialized in this period. The annual investments in innovation activities amount to 5% of annual turnover, i.e. to around CHF 3.9m per year.

The specific innovation analyzed in this case was a product innovation consisting of an improvement of existing conveyor technology. Like most of Machinery Ltd’s products, this innovation will require the integration in a system and will have the potential to create a new market. The manager expects the geographical distribution to be high with sales of €400,000 to €600,000 after three years. However, the potential diffusion within market segments is expected to be limited. With 21-40% gross profitability, the innovation’s rate of profit is rather low, but the market impact of the innovation outweighs this since the innovation will possibly create a new dominant design. From a technical point of view, this innovation can be imitated by competitors with modest effort but since it will be protected through patent rights, the innovation is rather difficult to imitate from a legal perspective. Machinery Ltd rent profile was identified as a “Champion” configuration with rather high volume, high rate of profit and high length of lifetime.

The diagnostic diamond in *Figure 1* reveals that the strength of the innovation management process is the internal steering of the commercialization process (innovation index score: 8.4) whereas the strategic planning constitutes its weakness (strategy index score: 6.4). The scores for the resource index (score: 7.0) and the market index (score: 8.0) lie in between. The market index is most negatively influenced by the fact that the customer benefits of the innovation were not fully researched and the

most appropriate pricing strategy was not fully explored. Regarding the resource index, the identification and recruitment of suitable personnel poses a major challenge to the company. The manager remarked that one of the major problems in terms of strategic planning was “the lack of a consistent, clear strategy”. This statement is reflected in the relatively low strategy scores compared to other areas of the innovation management process. For instance, extensive planning resulting in a formal, written business plan is only done if the project involves a new organization (i.e. the foundation of a new company). Otherwise, planning is limited to the calculation of project costs.

3.8 Textile Testing Ltd

Textile Testing Ltd is a service company specializing in testing and quality assurance services for the textile industry. Textile Testing Ltd conducts a variety of tests including colorfastness, flammability, fiber analysis, and fabric performance tests. Additionally, Textile Testing Ltd offers product, quality and environmental audits as well as supply chain assessments. The firm has 25 full-time employees. 20% of the turnover is generated in Switzerland and the remaining 80% in foreign markets. In the past three years, Textile Testing Ltd commercialized 1-5 innovations mainly consisting of new test procedures. In order to fund the innovation activities adequately, about 4% of the annual turnover was invested in the development of new products and new markets.

The company plans to commercialize further innovations within the next three years: it will develop a new product innovation which will be generated through a broad network. New tests at Textile Testing Ltd are developed together with other subsidiaries of the parent company and external specialists rather than with customers or suppliers. The rent profile of this innovation will be characterized by high volume, but low rate of profit and short product life cycle. As shown in *Figure 3* the innovation profile of Textile Testing Ltd is a “Lark Mirror”. The geographic diffusion will be far-reaching: the company can offer its services to companies all over Europe without maintaining an extensive distribution network. In most cases, the customers will send samples of their products to Textile Testing Ltd and the company applies its tests to it. However, since the sales per customer (measured in monetary units) are comparably low, the overall turnover after three years will not exceed €200,000. The gross profitability of this innovation will range between 21-40% while the net profitability will lie between 21-30%. Because this innovation will not change the dominant design significantly its market impact score is low. The short product lifecycle of this innovation is determined by its ease of imitation. According to the manager, it is almost impossible to protect test procedures through patents.

The innovation management process of Textile Testing Ltd shows one particular weakness: it lacks a formal, structured process. Neither a formal process for new product development nor a formal business plan exist. The manager was not surprised about the results, since, in her opinion, this type of rent configuration is a usual feature for the industry. The interview revealed that strong competition by large players and new competitors from low-cost countries are some of the main challenges faced by the company. Textile Testing Ltd cope with these challenges by developing ancillary services such as consulting, which will in turn increase customer retention.

4. Discussion

In this section, the results of the individual cases will be summarized, compared and interpreted. Due to the small sample size, findings are not statistically significant and they cannot be generalized. However, we will seek to develop a series of propositions which can be tested in future research.

The results of the cases are summarized in *Figure 3*. The rent configurations of the sample companies comprise three “Champions”, four “Lark Mirrors” and one “Shrimp”. This result is particularly remarkable against the expectation that the “Oasis” configuration would suit SMEs best. All other configurations pose one or more threats to the company: for instance, “Lark Mirror” and “Champion” configurations are characterized by high volumes, possibly exceeding the limited production capacity of an SME (Reboud & Mazzarol, 2003).

Figure 3: Overview of rent configurations and innovation management processes

Company	Size	Industry	Rent Configuration	Diagnostic Diamond
Software	Employees: 20 Turnover: ?	Software	11 11 8	8.0 7.1 7.72 7.8 8.0
Wood Floors	Employees: 10 Turnover: 10mCHF	Wholesale Trade	12 7 7	8.0 6.2 5.95 5.0 6.6
Ribbons	Employees: 120 Turnover: ?	Manufacturing (Ribbons)	8 8 8	7.4 7.2 6.75 5.2 7.2
Telecom Service	Employees: 20 Turnover: 3.8mCHF	Telecommunication	9 8 6	6.2 6.6 6.1 5.2 6.4
Publishing	Employees: 18 Turnover: 9mCHF	Publishing (B2B magazines)	5 5 6	6.2 8.7 6.4 4.0 7.0
Building Services	Employees: 15 Turnover: ?	Construction	15 6 6	5.0 6.0 6.6 7.8 7.6
Machinery	Employees: 150 Turnover: 78mCHF	Engineering	9 8 11	8.0 6.4 7.45 8.4 7.0
Textile Testing	Employees: 25 Turnover: ?	Business Services	9 6 5	6.8 6.0 6.03 5.5 5.8

The four companies with “Lark Mirror” configuration, Wood Floor Ltd, Telecom Service Ltd, Building Services Ltd and Textile Testing Ltd have one thing in common: they do not have capital-intensive production. Wood Floor Ltd is wholesaler of wood flooring, Telecom Service Ltd offers services to telecommunications companies, Building Services Ltd sells licenses or its technology and Textile Testing Ltd provides testing services for the apparel and textile industry. The nature of their businesses allows them to generate high turnovers with relatively few employees (these companies have on average between 10 and 25 employees). Building Services Ltd and Textile Testing Ltd can serve the European or even the worldwide market with their products.

“Lark Mirror” configurations can be associated with low or high rates of profit. In the sample, three of the four companies with this configuration have a low rate of profit (Wood Floor Ltd, Building Services Ltd, Textile Testing Ltd) and one has a high rate of profit (Telecom Service Ltd). The reasons for low profitability can be manifold. For example, Wood Floor Ltd is confronted with much larger competitors with more market power; Building Services Ltd has to fight against imitators and Textile Testing Ltd has to cope with competitors from low-cost countries exerting price pressure on the whole industry. In all three cases, competitive pressures from incumbent firms are high with significant erosion effects on the appropriable rent.

The third factor determining the “Lark Mirror” configurations is the short length of lifetime. Most of the four companies rated their planned innovations as (very) easy to copy from a legal as well as technical perspective. This is particularly interesting in the case of Telecom Service Ltd, since it is the only one of the four companies predicting high profitability for its innovation. In contrast to the other three companies, Telecom Service Ltd seems to act in an industry environment with less competitive pressure. It can be anticipated that the high profitability of the innovation will attract new entrants possibly eroding the rent.

The three companies with “Champion” configurations create tangible products. Software Ltd AG produces software, Ribbons Ltd manufactures ribbons and Machinery Ltd produces machinery. Furthermore, these three companies are the biggest companies in the sample. If the software developers working in Slovakia for Software Ltd are added to the firm’s headcount, these three firms are by far the biggest companies in the sample. It appears therefore that bigger SMEs have more elaborated processes for innovation assessment. As a result, only innovations with favorable rent configurations will be introduced in the market place. This proposition would be supported by the sample data since the three firms with the “Champion” configuration have the highest average values in the diagnostic diamond. The results also suggest that firms producing tangible products are more likely to realize innovations only when these will create rents which justify the investments which have to be made into additional production capacity. The resource risk for these companies in terms of fixed costs is much higher than for a small service firm which will employ one or two additional people in order to provide new services.

Considering the relationship between rent configuration and innovation management process (i.e. the diagnostic diamond), it can generally be assumed that sound innovation management process is associated with a favorable rent configuration. When the firm has a sound process in place, it will be able to determine the potential risk-return-profile of the innovation and be capable of deciding if it is willing to take these risks. This is only possible if the company reduced the uncertainty associated with this assessment through the collection and analysis of relevant data about competitors, customers, and other industries variables.

However, an unfavorable rent configuration (e.g. “Shrimp”) does not necessarily mean that the firm has a poor innovation management process. Several factors can lead to unfavorable rent profile. First, the innovating firm may have evaluated the risk-return structure thoroughly and wants to commercialize the innovation notwithstanding its unfavorable rent potential. This can be the case where there is intense competition in an industry and the rents generated by an innovation will underlie fast erosion by all kinds of competitive (re-)actions (for instance, competitors imitate or out-innovate the firm fast, switching costs for customers are low). Nonetheless, the firm needs the innovation in order to keep up with competitors or the exit barriers in the industry are high. An example of this kind of relationship is Textile Testing Ltd. The manager did not seem to be surprised about the unfavorable rent profile of the planned innovation since it was exactly what she expected: “Sometimes, we’re surprised ourselves that we still exist”, she said.

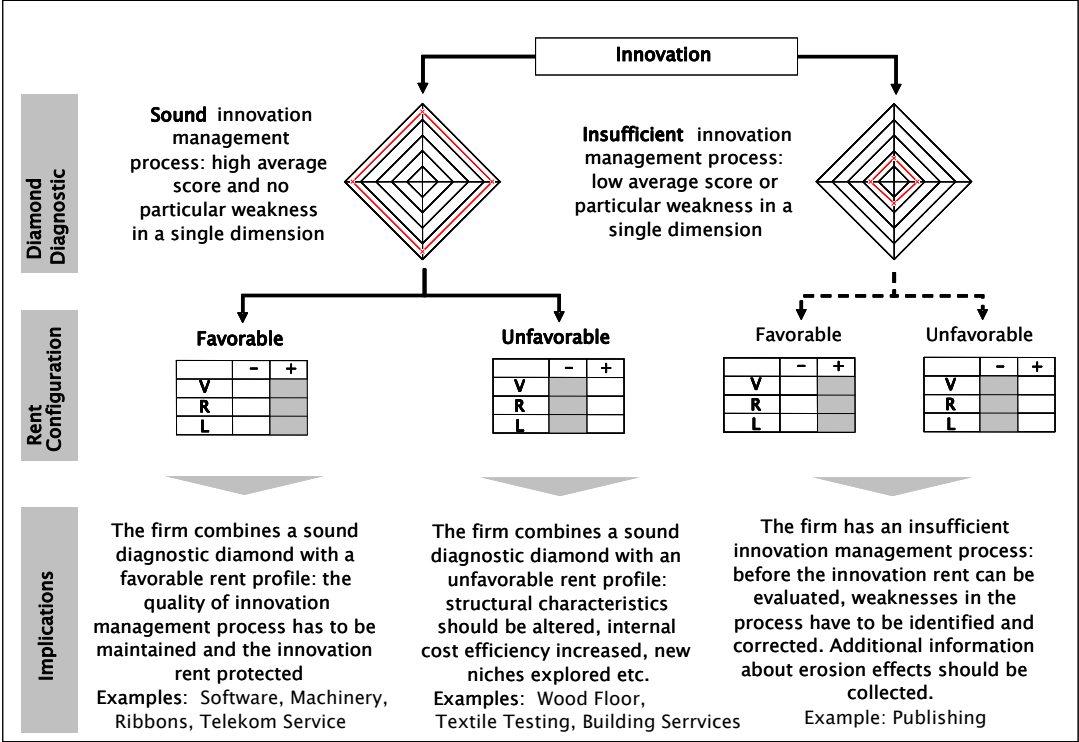
Second, the innovator sees the innovation as part of an overall strategic plan which will secure the future survival in the marketplace. Even though the innovation itself will yield returns barely covering the costs of its development and market introduction this innovation can be crucial for future business development. For instance, if Publishing Ltd extends its online-offer by providing well-investigated content for B2B users, this can be rather unprofitable in the beginning. Nevertheless, it can lead cus-

tomers to prefer Publishing Ltd’s content over other web-content which is freely available and can be a source of customer loyalty. In the future, this might prepare the ground for further product extensions and might be the reason why Publishing Ltd will survive the structural change in its industry. One could argue that this has to be included in the evaluation of the innovation rent. From a pragmatic point of view, these strategic advantages will be based on argumentation and are difficult to trade off against present disadvantages resulting in an anticipated low innovation rent.

Third, unfavorable rent configurations could be followed because of problematic decision-making processes. When, for instance, a family-owned company decides to implement an innovation against the resistance of executive managers, the best internal management process might prove worthless. Managers might have analyzed all aspects of the innovation and have come to the conclusion that it is not promising to continue with a certain innovation but other, more influential groups with less information might have a different opinion.

Figure 4 schematically depicts the relationship between innovation management process (diagnostic diamond) and rent configuration. However, the definition of “favorable” and “unfavorable” rent profiles is difficult. It can be assumed that “Champion”, “Oasis” and “Lark Mirror” (with high rate of profit) configurations are rather positive whereas “Shrimp”, Gadget”, “Joker” and “Lark Mirror” (with low rate of profit) are unfavorable. Similarly, it is not always easy to establish when the diagnostic diamond is “insufficient” or “sound”. We can assume that when the average score of the four dimensions falls below 6 or one of the dimensions falls below 4, the innovation management process has to be revised.

Figure 4: Relationship between diagnostic diamond and rent configuration



The implications of the empirical findings are particularly relevant for researchers and innovators using the diagnostic tool. Researchers examining strategic innovation decisions and innovation management processes in SMEs can use the insights gained during the empirical study in order to formulate hypotheses and test them with a larger sample size. For instance, it would be interesting to examine if there are relationships between the quality of the innovation management process (as represented by the diagnostic diamond) and company or industry characteristics. Another interesting research question would be if the often praised flexibility of SMEs coincides with reality. In the sample, many SMEs seem to struggle with diverse customer demands and apparently have difficulties to acquire the right competencies fast enough to meet them.

Furthermore, as part of a larger empirical work, the collected data will be used in order to compare strategic innovation in different countries and will lead to well-grounded statistical statements about the nature of strategic innovation and decision-making in SMEs. Eventually, the suggestions for an improvement of the diagnostic questionnaire might result in some adaptations, further increasing the value of such an evaluation aid for innovators.

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