

## **Opportunistic Adaptation in Start-Up Companies**

### **- Exploring the links between business model learning and the resource base**

Linda Andrén, Mats Magnusson and Sören Sjölander  
Department of Innovation Engineering and Management,  
Chalmers University of Technology, Göteborg, Sweden  
Correspondence: matmag@mot.chalmers.se, phone: +46-31-772 1204

#### **Abstract**

It has been proposed that a key success factor for entrepreneurial start-up companies in dynamic industries is their capacity to continuously adapt their business opportunistically. However, the concept of opportunistic adaptation is in need of further development and clarification in order to make it possible to empirically test its usefulness, something that this far has been done only to a limited extent. Opportunistic adaptation has primarily been regarded as an entrepreneurial strategy focusing on rapid learning and change in order to adapt to market changes. We argue that two important dimensions left out of this process are the roles played by the resources and capabilities of the firm, and the entrepreneurial vision guiding business development. As entrepreneurs develop new businesses they do not only react on what happens in the existing market but base their actions also on a vision of a desired future state. A tentative theoretical framework combining the dynamic capabilities approach of the resource-based strategy school and the cognitive dimension of the business, conceived as entrepreneurial vision, is developed. In order to explore how the entrepreneurial vision and the firm's capabilities and resources influence the business development process, we have performed case studies of the business model evolution in 26 start-up companies in the emerging Swedish mobile Internet industry. A number of observations from the studied companies are described and discussed in relation to the theoretical framework. Finally, some important issues derived from the theoretical elaboration and the empirical observations are brought forward. In particular, it is noted that the industry experience of the founding/management team, interaction with customers, and the dependence of external parties are factors that influence the possibilities for a start-up company to succeed in developing a new business.

## **Introduction**

According to Bhave (1994), the venture creation process is an iterative, nonlinear, feedback-driven, conceptual and physical process, as captured by the statement that “[a]n emergent business is embedded in an equivocal reality where the possible results of specific actions taken in the present can only have assumed future consequences.” (Gartner et al., 1992, p. 18). Consequently, rational planning, highly segmented functions, and deductive analyses may not provide much help to innovative organizations or entrepreneurs acting in such ambiguous and complex domains (Quinn, 1985). Therefore, in new technology-based ventures, changes along dimensions of strategy are more to be seen as reflections of a process of trial and error (Nicholls-Nixon et al., 2000). Bhidé (2000) stresses the necessity for entrepreneurs acting in turbulent and uncertain environments to experiment and change, and suggests that opportunistic adaptation is a key to success in emerging businesses. There is little reason not to agree that opportunistic adaptation may constitute a viable approach in dynamic business environments, in which it is not at all clear how a sustainable competitive advantage can be found and defended. However, there is this far limited empirical evidence supporting Bhidé’s (2000) proposed view of entrepreneurial strategy as primarily a question of rapid and opportunistic adaptation to external changes. One of the reasons for this is the present lack of measurement instruments capturing firm-level opportunity-based behavior (Brown et al., 2001). Another issue not taken into account is the role played by resources and capabilities controlled by the entrepreneurial firm in the process of adaptation. The resources and capabilities of a firm are used in realising desired changes, but also put a limit to what is possible to do. Similar to many other strategic approaches (e.g. Porter, 1980) the primary focus of opportunistic adaptation has been on market and customer segments. Much less attention has been paid to how the adaptation actually is performed in terms of resource utilization and development. Furthermore, the view of opportunistic adaptation has primarily been one of adaptation to actual changes in the marketplace. Though, as entrepreneurial start-ups in new industries often aim at generating something radically new, for which there is not yet an existing market, this view leaves us wanting. Entrepreneurial efforts can be seen as guided by a vision of a desired future state, and accordingly this cognitive dimension needs to be dealt with. Hence, there is a need for further theorizing concerning opportunistic adaptation as well as more empirical investigations focusing on the role of both resources and capabilities and cognitive dimensions in the process of opportunistic adaptation.

The aim of this paper is to increase our understanding of opportunistic adaptation as an entrepreneurial strategy in turbulent, high-velocity industries, taking into consideration the resources and capabilities of the firm and the entrepreneurial vision guiding its development. In order to do so, case studies of Swedish start-up companies in the emerging mobile Internet industry have been performed. The structure of the article is as follows. In the next section, a

tentative framework extending the process of opportunistic adaptation to include also resources and capabilities of the firm and the role played by entrepreneurial vision is presented. This framework draws on literature on learning, entrepreneurship, resource-based strategy and evolutionary economics, and it allows us to describe and assess the business development process, its environment, and the outcome of the process. In the subsequent section the methods used and the specific research setting are described. Thereafter, some empirical findings from case studies of mobile Internet start-ups are presented and elaborated upon. Finally, based on the theoretical development and empirical observations, a number of important issues regarding business development processes are identified, and implications for start-up managers are discussed.

### **On survival and success of entrepreneurial businesses**

For entrepreneurs starting a new business it is challenging to identify and realize a business proposition that results in some kind of competitive advantage, which enables the firm to generate rents. Opportunistic adaptation reveals a view of entrepreneurial strategy in which competitive advantage primarily derives from firm-external factors and where firm-internal factors play a secondary role. This is based on the idea that competitive advantage stems from the position that a company holds in relation to direct competitors, customers, suppliers, substitutes and potential new entrants in an industry (Porter, 1980). Another potential source of competitive advantage resides in the idiosyncratic resources of a firm (e.g. Wernerfelt, 1984; Grant, 1991). This contrasting view of strategy points to the need to identify, develop, protect, and deploy unique or difficult-to-imitate resources and capabilities in a way that provides the firm with a sustainable competitive advantage and thereby a superior return on capital<sup>1</sup>. The earlier mentioned contributions to the resource-based theory of the firm explained the rent-producing capacity of firm-specific resources and capabilities solely with their unique inherent characteristics, revealing a strong firm-internal focus on the identification of competitive advantage. This radical stance was modified by Amit and Schoemaker (1993), who argued that the unique characteristics of a firm's resource base are not the only determinant of its capacity to generate rents, but that external factors need to be regarded, in terms of the extent to which strategic assets<sup>2</sup> of a firm overlap with strategic

---

<sup>1</sup> The definitions of resources and capabilities used here are the ones proposed by Amit and Schoemaker (1993). They define resources as stocks of available factors that are owned or controlled by the firm. Resources are converted into final products or services by using a wide range of other firm assets. Resources consist of competence (IPR, technology, knowledge and skills), capital, material, and labor.

Capabilities refer to a firm's capacity to deploy resources. The capabilities are information-based tangible or intangible processes that are firm specific and developed over time through complex interaction among the firm's resources.

<sup>2</sup> The strategic assets of a firm consist of a subset of difficult to trade and imitate, scarce, appropriable and specialized resources and capabilities that bestow the firm's competitive advantage (Amit and Schoemaker, 1993).

industry factors<sup>3</sup>. The implications of this are that managers need to change the resource constellation of the firm as they observe changes in the set of strategic industry factors. Hence, they advocate an adaptive approach to strategy that strives to continuously match the firm's resource base with a changing environment. Eisenhardt and Martin (2000) go even further as they argue that competitive advantage in dynamic markets is often short term and that managers in these situations must strive to create a series of temporary advantages in a way that closely resembles Bhidé's (2000) concept of opportunistic adaptation. This stands in sharp contrast to the lion's share of earlier resource-based theory, which for good reasons has been criticized for being overly static (Foss, 1998). The clearly adaptive strategy approach that comes through in the work of Amit and Schoemaker (1993) contributes to the development of a more dynamic stream of resource-based theory. With few exceptions (Dierickx and Cool, 1989; Lei, 1997; Teece et al., 1997) changes to the resource base over time, e.g. in terms of organizational learning have not been taken into account in resource-based strategy, which is most certainly a contributing factor to why this theory has been regarded as less useful for explaining performance of emerging companies. On the other hand, by completely excluding questions regarding resources and capabilities, important managerial aspects regarding the realization of an entrepreneurial idea are neglected. Therefore, to consider how the adaptation process is conditioned by a firm's specific resource base constitutes a first step towards developing more action-oriented implications for the entrepreneurs attempting to continuously adapt their businesses and exploit opportunities in a dynamic environment.

### **Dynamic capabilities**

The dynamic capabilities approach (Teece et al., 1997) constitutes a recent development of resource-based strategy which stresses the use and development of existing firm-specific resources and capabilities in relation to changing environments, and consequently propose that the resource constellation and its reconfiguration over time have to be taken into consideration. Teece et al. (1997) propose that dynamic capabilities consist of three components: position, processes and paths. Position refers to the specific constellation of resources that a firm controls at a certain point in time. This resource position decides the rent-producing capacity (Eisenhardt and Martin, 2000), resulting from the competitive advantage that can be derived from the unique inherent characteristics of the resources and the overlap between strategic assets and strategic industry factors (Amit and Schoemaker, 1993). As markets change, the resource constellation of the firm needs to be continuously modified by a set of organizational and managerial processes (Teece et al., 1997), more specifically processes that integrate, reconfigure, gain and release resources (Eisenhardt and Martin,

---

<sup>3</sup> Strategic industry factors are the set of resources and capabilities that has become the prime determinant of economic rents for industry participants (Amit and Schoemaker, 1993).

2000). The suitable balance between these different processes to a large degree depends on market dynamics. In rapidly changing markets, dynamic capabilities are less concerned with existing knowledge and much more with quickly creating situation-specific new knowledge (Eisenhardt and Martin, 2000). In more moderately changing environments, they instead come to deal primarily with the use and transformation of existing resources. Given this we can also conclude that in dynamic and uncertain markets, the normal conception of capabilities as routines becomes questionable (Eisenhardt and Martin, 2000).

A closer look at the concept of opportunistic adaptation reveals that the learning processes taking place in entrepreneurial ventures so far have been insufficiently conceptually developed. To a large extent, learning has been attended to in terms of a seemingly narrow behaviorist perspective, neglecting the cognitive mechanisms that Baron (1998) has argued are important to study in order to understand what determines the success of certain entrepreneurs. Another contribution alluding to the need to take cognition into consideration is made by Eisenhardt and Martin (2000), who mention that dynamic capabilities in high-velocity markets are characterized by the creation of multiple options, i.e. the development of alternative routes ahead. This leads to the third component of the dynamic capabilities perspective, paths, which refer to the trajectory that has led to a certain resource position, and also influences the possible future development in terms of path-dependency. Previous research has revealed that a firm's core capabilities do not necessarily have a positive value for the firm, but can under certain circumstances turn into core rigidities (Leonard-Barton, 1992). Edlund and Magnusson (2002) argue that one feasible explanation of this paradox is the existence of a dominant management logic (Prahalad and Bettis, 1986), i.e. the inability of managers to question the utilization of capabilities that have previously provided the firm with competitive advantage. The dominant management logic can be described as the mental models or frames that guide decision-making, strategy formulation and resource allocation in a company, and are as such an important part of its dynamic capabilities. These cognitive frames are normally captured as organizational routines. Though, as mentioned above, routines seem to play a less important role in dynamic environments. Nevertheless, some kind of integrating mechanism is needed in order to give an organization some overall direction that the activities performed by a number of independent individuals would not have. A number of authors have suggested that one such integrating mechanism could be found in the mental models or cognitive frames that an entrepreneur or manager develops and manages to convey to other individuals in the organization (Fransman, 1994; Witt, 1998). In a rapidly changing environment, where it is questionable to explain firm behavior by the existence of routines, the "entrepreneurial vision" appears to be a potentially fruitful concept for our understanding of the collective activities in the firm.

## **Entrepreneurial vision and business models**

Based on the idea that the environment is perceived in terms of an image developed within the firm by the entrepreneurs (Penrose, 1959), Fransman (1994) stresses the role played by the “vision” of a firm. The vision of a certain firm is defined as “...the dominant set of beliefs in the firm regarding the firm’s internal and external circumstances, the shape of things to come in the future and, in the light of these factors, the way the firm should ‘play its cards’.” (Fransman, 1994, p. 755). A concept closely related to vision is the “conception” of a business (Witt, 1998). While recognizing the attempts of e.g. Nelson and Winter (1982), Witt (1998) argues that these authors in dealing with the role of cognition tend to reflect on the role of routines rather than of conceptions, ignoring the fact that conceptions are necessary for organizing. Witt (1998) argues that conceiving a business venture is a necessary prerequisite for undertaking it. Underlying the creation of a firm there is always some entrepreneurial imagining about what the business is to do and how to do it, under what constraints, and how to work on those constraints over time (Witt, 1998). A business conception has the features of a cognitive frame and it helps to interpret the current events in the perspective of the firm’s overall orientation and associates appropriate actions. One important point in this work is that it presents a complement to routines that makes it possible to analyze entrepreneurial processes, in which routines most certainly play a more limited role than they do in mature and stable firms.

The shift from attention to routines to a focus on entrepreneurial vision or business conception is an important passage in order to understand how business development processes take place. Though, we see a need to go even further, embracing a point made by Hill and Levenhagen (1995), namely that mental models are not stable over time. What is not made explicit in earlier works is the necessity to question and revise the entrepreneurial vision, or business conception, over time. Arguably, in a turbulent environment the entrepreneurial vision must be able to co-evolve with the unfolding business venture in order to cope with its uncertainties and the initial lack of knowledge. Furthermore, while developing the business the current resources have to be taken into consideration, i.e. the entrepreneurial vision must be co-developed and matched to the resource base and the entrepreneurs have to consider if the entrepreneurial vision matches the resources they control or potentially will control.

Hence, in order to understand the early development of start-ups we need to consider both the stock and the flow of resources (Dierickx and Cool, 1989), as well as the cognitive processes that are infinitely interrelated with the former. Entrepreneurial firms act from their vision and the limits that they have in terms of resources and capabilities. The possibilities to reconsider their initial ideas and experiment are dependent on both mental models, and the resources and capabilities that they currently control. The change of mental models is however difficult and dependent on feedback that indicates whether the business model is working or not.

Summarizing the above, we note that the inclusion of resources and capabilities, and entrepreneurial vision are needed in order to generate a more comprehensive and useful framework for opportunistic adaptation.

The concept of entrepreneurial vision aids us in understanding some of the key elements of an evolving business. However, in order to be measurable and practically useful, the vision needs to be operationalized. We suggest that this is done in terms of what in practice is usually referred to as a “business model” (Sjölander et al., 2001), composed of three key components: a description of what the company offers to its customers (an offering consisting of products and/or services), who these customers are (market and customer segments), what value is created and how this value is shared between all involved actors (revenue model). From the reasoning above we can see that learning, business model development and the accumulation of resources are interrelated processes. In order to understand business development processes in more detail and provide actors involved in these processes with a better understanding regarding the management of these activities we see a need to investigate these topics further. We will attend to this by empirically exploring the following questions:

- a) What changes can be observed over time regarding the entrepreneurial vision of the firm, in terms of modifications to the business model?
- b) How are changes in the entrepreneurial vision related to the company’s configuration of resources and capabilities?

### **Research setting and methods**

To study how the business model development and the accumulation of resources are linked we have to study start-ups in their early development when the business model is changed and the resource base is built. We believe that the changes in the business model may be more frequent in an industry which is in an innovative evolution, and therefore easier to detect. Based on these assumptions, we have chosen to study the process within the Nordic Wireless Internet industry<sup>4</sup>. Because of the dynamics in its technology base and its international markets the Nordic mobile internet industry was seen as an empirical probe suitable for studying the dynamics of entrepreneurship in technological change, changes in resource base and entrepreneurial learning.

The notion of mobile Internet was first made in 1994 meaning to take Internet mobile. Today the concept is broader and means the provisioning of mobile data communication services, the system for doing so and various end customer and machine terminals. Mobile Internet has been made possible by the technical convergence of telecommunication technologies and data

---

<sup>4</sup> Companies included in the study are companies, primarily in Sweden and Finland, whose main business idea and existence are regarded as “the infrastructure enabling wireless access to information and services distributed via Internet and thereby making information and services available to the user, regardless of time and location”.

communication technologies and if you like of a more centralistic telecommunication paradigm with a more decentralized IP paradigm (Internet Protocol). The Nordic market has been remarkably dynamic in this area, being the home turf of 1st, 2nd and 3rd generations of mobile technologies. Within a radius of less than 200 km we find two world leading equipment manufacturers with their roots in the telecom paradigm, Nokia, market leader in terminals, and Ericsson, systems market leader as well as two innovative operators, Sonera of Finland and Telia of Sweden. Consumers in Finland and Sweden show the highest penetration rate of mobile phones and Internet linked PCs simultaneously. This advanced Nordic market, together with periodically rich sources of Venture Capital created a fertile ground for start-ups. Since 1995 about 200 firms have been started. During this period many basic changes have taken place in markets and technologies. With the Internet hype of the late 1990s venture capital was poured over the infant mobile Internet industry and the Stockholm - Helsinki area was labeled Wireless Valley by Time magazine. Beginning in March 2000 with the downturn of NASDAQ VC, investments in the Nordic mobile Internet start-up industry has soured, leaving many companies with the acute need to change non self sustaining business models and prioritize customer revenues over new equity, to generate the needed cash flow to be able to survive. An extra kick down for the market was generated by the hilariously high 3G license-fees paid by operators to governments in England, Germany and France. These fees correspond to a per capita up-front payment from all citizens in each country ranging from Euros 652 for England, 620 for Germany and 334 Euros for each citizen in France. These huge fees made operators financially so weak that their credit ratings fell from AA to A- and in one case to BBB- in less than 12 month (Björklund et al., 2001).

One could argue that the telecom industry, especially the Nordic, made several strategic and tactical mistakes: The industry promoted technology rather than services and applications but failed to provide an infrastructure that could support third party content and application developers. End users got WAP and GPRS but no content! More specifically, some critical mistakes are listed below:

- Marketing technologies rather than end-user applications (e.g. WAP, GPRS, 3G): Poor understanding of what consumers really want from Mobile Internet.
- Failure to support third party content and application providers: No means to extract revenue, no open application platforms.
- Exercising too much control over the value chain: All content through operator controlled portals.
- Learning the wrong lessons from earlier successes: SMS became a hit but unlike WAP it is also a working application with a large end user value (WAP = wireless application protocol, SMS = short messaging service).



As a result of the above, the rate of investments in new systems and applications were severely lowered, which made investors in Mobile Internet start-ups even more cautious. During 2001 it became less clear that 3G of the telecom paradigm was going to be the future big winner in mobile Internet. Other technologies with roots in the more open IP paradigm - openness that stimulates decentralized creativity, innovativeness and entrepreneurship - such as WLAN (Wireless Local Area Networks) and Java have made the US and Silicon Valley come back in a leading position.

It could also be argued that the Nordic telecom industry has been, and still is, very successful in building managed solutions for end user services compared to the more enterprise oriented, US based computer industry. There is still a trend among US wireless operators to favor Nordic technology and centralized service management solutions over their own open but disorganized infrastructure, an approach that works fine in the enterprise world but not so well in a mass consumer market. Thus, one conclusion is that there is still an opportunity for Nordic entrepreneurs in the infrastructure and systems management markets, but that US based start-ups will conquer the application layer.

During 2000-2001 \$12 billion have been invested in mobile start-ups in the USA while only \$4 billion have been invested in European, mostly Nordic, mobile start-ups. This is gradually shifting the lead from the Nordic Telecom-dominated mobile Internet industry towards the IP-dominated mobile Internet industry of northern California. These changes have directly influenced the market for talents. Towards the end of 2001 it became gradually much easier and cheaper to recruit technical as well as managerial talents in the Nordic area. Altogether, during the study period relevant for this paper drastic changes in the resource markets for capital, labor, and supplies along with a slow down of end user consumption, driven by a general economic slow down, have made the market for Nordic mobile start-ups run at a slower pace as well as made actors more cautious and hesitant on technology bets. This in turn has forced most start-ups to learn and adapt their business models accordingly.

To study how the start-ups are adapting their business models as the venture develops over time, and how this development is related to the firm's resource base, we have used a randomly chosen sample from a database with 169 unlisted Nordic start-up companies related to Wireless Internet. 26 case studies have been conducted based on a randomly selected sample. In-depth interviews with the founders or the CEO have been conducted in their companies. The interviews were semi-structured and lasted approximately two to three hours. The questions primarily concerned current and initial business models, internal and external resources controlled, changes to the business model and the resource base, as well as the causes of these alterations. The interviews were tape-recorded and afterward these tapes have been transcribed. These transcriptions have been analyzed and quotations regarding changes

in business model and resource base, inter-relationships between these, as well as consequences for the business have been sought for.

### **Business model development in Swedish mobile Internet start-ups**

A first look at the observations from the studied companies (see Appendix 1 for a brief summary) reveals that with few exceptions, the companies have changed at least some part of their business model during their existence so far. Given the turbulent development at the industry level, this is far from surprising. In general, the companies have been going through a tough period after an initial hype with extremely promising perceived prospects. The access to capital has changed radically during the lifetime of the firms and this has in most cases implied far-going changes to their initial expansion plans. As a consequence, many of the firms have also been forced to reduce their number of employees. The sudden shortage of venture capital has also been a major cause of changes to the firm's business model as it has created a need to quickly generate revenues to substitute for the lack of new capital input from venture capitalists. Looking at the cases included in this study most of them have therefore been obliged to start selling earlier than initially planned. One of the voices from the cases illustrates this: *"The situation in the world has forced us to find a revenue model generating rents earlier. We have been forced to adjust to the existing conditions, to the market. We thought that the products, e.g. mobile phones with blue-tooth, would have been launched this year, but that has not been the case. Therefore we have put much more effort into producing these gadgets ourselves and use them as a commercial platform. The change in the market has left us in a catch-22 situation. You want to put in the efforts if you see concrete needs; at the same time you have less resources to do that. This requires an enormous focus, and we have really focused on developing these products that will give us revenue directly. This also results in a model where you say that if you want it earlier then you have to pay for it, i.e. you want to have a customer financing the development."* This quotation explicitly illustrates that the limited access to capital has forced the specific company to reconsider its business model.

But the shortage of funding has not only implied modifications to the revenue model used. It has resulted in chain effects throughout the industry as business partners are forced to revise their plans or cease to exist. More specifically, the industry has been characterized by numerous delays. Some specific problems have been that terminals have not been released as first announced and that 3G networks have not been deployed at the pace initially intended, and therefore exploitation has been delayed. These external dependencies have forced companies to reconsider their business models and sometimes also to change their resource base to be able to start to build the necessary equipment themselves. As one CEO said: *"A prerequisite for our business is that there are terminals and that people use their computers to log on to the net. Furthermore, we need the operator to develop their nets and they must*

*understand how to package these types of services. If the operator does not offer and price their services in a sensible way then the users will not use these either. These are the strong external dependencies that we have, and there are no changes in the business model that could improve this.*” The CEO did not sense that it was possible to adjust the business model to the market, but points to another critical issue, namely the dependency of external actors.

If we turn to the specific inter-relationship between the resource base and the business model we see, as mentioned above, that several of the companies have adjusted their business model so that they do create revenues earlier, in order to secure sufficient capital. In these cases the resource base has had direct implications on the business model. One of the companies that has adjusted their initial business model expressed that they found out that their technology was very well suited for the type of solutions they are currently working on, i.e. the resource base of today fit the adjusted business model of today. The capital constraints were the primary cause for this company to look for a business model that generated revenues earlier in time. This also forced them to see that their technology was very well suited for this new use. Furthermore, the CEO of this company has the initial business model in mind for the future, for which the market is not ready today.

The coupling between the resource base and the business model is also seen in the following phrases from one of the companies: *“It is hard for a small actor to go out on the market and fight, therefore one needs to find someone larger who is interested, one that has distribution channels globally and is interested in entering a new market with a new innovative product. Our strategy was to merge with a larger player within data communication who was interested in entering the telecom market, but unfortunately it was not clear how this was to be done.”* This company succeeded neither in finding a partner nor to receive any funding. The fact that they did not receive any funding can of course be due to several reasons, e.g. a radical change in the venture capital market. Though, one conclusion is that they were not able to secure the relationship with a partner, and thereby lacked important assets needed to build a profitable business. The same company was asked by a VC company to change the CEO in order to attract capital, but rejected this. As a result, the company did not receive any financing and due to this they did not have sufficient resources to develop the company further. Altogether one could say that the resource base and the imagined business model did not fit.

Another factor that emerges as important is the industry experience of the founding/management team. This can be illustrated with the differences found in the following quotations. The first one is from a company with an extremely experienced founding team: *“Together, we in the founding team have had all the large players on the world market as customers: Ericsson, Motorola, Mitsubishi, you name it. We were convinced*

*that blue-tooth would become something and we did have to do something.*” Working with key actors in the development of blue-tooth technology, the members of the founding team had critical knowledge about the limitations to the new technology and the problems experienced by firms due to these limitations. As the prospects for a company that could present solutions to these problems seemed very bright, the founders could generate a business plan that quickly attracted a number of investors. This made it possible to attract talented engineers and researchers that could take on the challenging development tasks.

A similar pattern can be seen in another company with a very experienced founding team: *“At the time when the spin-out was done we had partly other ideas, not completely different, but there were variations on the theme, but we decided quite quickly as we had good insight in the reality of the operators. We know very well what problems the operators are fighting and what opportunities they have.”* Working closely as consultants to telecom operators, also the founders of this company became aware of the opportunities. Given this, the step to formulating a first business model and initializing its realization was not very long.

The two statements above should be contrasted with the one below, stemming from a company founded by four persons starting the company just after graduation from university: *“We felt that, ok this will not generate a lot of money. Then it is better to be fragmented in the beginning, shoot a couple of shots to see where we get the hits. And once you get a hit you can allocate more resources to it.”* The business model of this company has undergone radical changes over time regarding products, markets and customers. The key reason for moving from the initial business model was that the market was not at all as large and receptive for the offering as initially imagined. As other opportunities outside of the initial focus emerged, the company started to serve also these customers in order not to run out of financial means. Over time, the initial business has turned into a broader and more generic, but at the same time much less focused business.

A factor closely related to industry experience that appears to be important to consider is customer interaction. To some extent, customer interaction could actually substitute industrial experience. Not only can differences be found regarding the degree of interaction with customers that start-up companies display. Another important aspect seems to be the kind of customer involvement that takes place. This is clearly illustrated by the words from the president of one of the companies that have been forced to close down their operations: *“We released the product on the market, started the marketing – to sell. By then we had talked to about 20 customers, all of whom had said that this was a brilliant idea. This just had to work. In retrospect, what happened and what did not happen was that all of them, when we went out to sell the product, thought that it was a brilliant solution, working really well. But they didn’t really know what to do with it. It was difficult to get the sales going. We thought that we had*

*received feedback from 20 customers.*” What is seen in this particular statement is that the quality and depth in the customer interaction is what really matters, not the absolute number of contacts. If there is no commitment to buying, positive feedback from customers can be of little value, and even misleading.

## **Discussion**

What is clearly seen in most of the cases is that the business models have undergone frequent and often substantial change during the venture process. Fewer, and less radical changes can be seen on the resource side of the firms. The changes that take place are also primarily concerned with financial resources and only to a lesser extent influence the knowledge-based capabilities residing within the firm. One possible explanation for this is that the firms are so small that it is difficult to identify any distinctive capabilities that are more systemic and not merely consist of the knowledge and skills held by key individuals. Though, what is clearly seen is the close inter-relationship between the business models developed and the resources available. The observation that the resources available, in most cases in terms of capital, influence the formulation of business models has implications for resource-based theory as it shows that the inter-relationship between resources and business models is bi-directional and not merely a question of adapting to the market by restructuring the resource base, as implicitly revealed in e.g. the models presented by Amit and Schoemaker (1993).

According to Bhidé (2000), there is a noteworthy difference between top executives of mature firms and entrepreneurs. Existing assets and norms limit the variables that top executives of mature firms can manipulate and they cannot easily change the firm’s basic purpose or its organizational climate. Entrepreneurs have more freedom to decide the long-term goals for their firm, the norms they will seek to develop, the customers to target, and the assets they will invest in. These choices are normally made in an intuitive and adaptive fashion. Bhidé also stresses that the capacity to adapt to chance events and to execute strategies for acquiring resources play important roles in separating the winners from the losers. Though, also for entrepreneurs it can be difficult to change existing conceptions and re-formulate their business models. We find it useful to look at the contribution made by Hill and Levenhagen (1995), in which it is underlined that only action followed by observation will fully verify a novel conceptualization of cause and effect relationships. Thus, only through action entrepreneurs can test and confirm beliefs about the technological, market and economic feasibility of a commercial concept. This reflects that implementation of a new technology, e.g. in terms of a venture process, is a dynamic process of mutual adaptation between the technology and its environment (Leonard-Barton, 1988). In complex environments with limited possibilities for analysis and planning, the implementation becomes an iterative process in which misalignments caused by equivocality and uncertainty are reduced.

This view of the process of venture creation calls for new approaches to management. This has earlier been proposed by Brown and Eisenhardt (1997), who mean that a rational planning perspective is useful in mature industries with comparably few and slow market and technology changes. In dynamic industries, a more experiential and iterative approach stands out as more promising. Similar suggestions are found in the work of Lester et al. (1998), who make a distinction between analytical and interpretive management. The analytical management style, which seems to be prevalent in mature companies, focuses on reduction of uncertainty and ambiguity, striving for a quick closure and rational planning and execution of tasks. Interpretive management, on the other side, consists of an ongoing process without a clear end characterized by a continuous dialogue between all involved parts, embracing ambiguity and uncertainty as natural components of creative work. What are then the practical implications of this for the entrepreneur trying to develop a new business?

To understand if the business model is feasible the entrepreneurs will have to try to "sell" it to potential employees, the capital market and last but not least important to the customer. By doing the latter the entrepreneur will be able to figure out if they are on the track of identifying the actual customer need. An important component in this search process is former knowledge (c.f. Shane, 2000), based on experience from a relevant industry. In an earlier study by Cooper et al. (1994) it was found that industry-specific know-how contributed to both survival and growth of new ventures. In case the entrepreneurs do not have this type of experience, the same understanding needs to be acquired in the business development process. Critical in this respect is the dialogue that the entrepreneur manages to establish with customers. Eisenhardt and Martin (2000) point to this by stating that in high-velocity markets, dynamic capabilities rely on real-time information, cross-functional relationships and intensive communication between people interacting with the external market and people involved in business development processes. In combination with the observation above that formulation of business models is influenced by the available resources, we would argue that the specific learning processes involved in new venture creation highlights the problem of giving entrepreneurs too much resources to realize a business idea. With abundant resources, the risk of formulating a business model that does not have to generate revenues in the near future increases. This, in turn, may reduce the direct feedback from customers that the entrepreneurs receive and, consequently, can prolong the time it takes to find a suitable business model.

Entrepreneurs and their effective learning thus are dependent on feedback in all forms to be able to learn rapidly where they can exploit the customer needs by creating the largest customer demand and the largest revenue stream, implying that they over time may have to redefine what the product/service is, who the customers are, and what the revenue model

looks like. The feedback can be advice given by VCs, rejections in financial proposals by VCs, positive response on a product from customer, a customer accepting to be involved in a project, persons accepting to work on risk, i.e. without being granted payment or with a very low salary on short terms, etc. All this input is then interpreted by the entrepreneurs, who create a new image of what is a feasible business model. At the same time, entrepreneurs must consider what resources they currently control, and which they do not control, comparing the potential risk of being dependent on external parties with the risk of having the resources in-house.

A shortcoming of the resource-based perspective in relation to the issue of external dependence is the strong focus on internal resources and capabilities. Teece (1998) argues that governance decisions involve both questions of what assets to build inside the firm and what to access externally. A promising attempt to combine the network approach and resource-based strategy to uncover the source of competitive advantage has been conducted by Foss (1999). Foss suggests that we may actually apply the analytic categories developed within the recent resource-based perspective in strategic management to the analysis of network capabilities, and argues that the competitive advantage may be sustained by a number of interaction effects between firms' capabilities and network capabilities. Lorenzoni and Lipparini (1999) also contribute to this understanding by introducing the concept of relational capabilities, implying that the capability of a firm to interact with other companies is a distinctive organizational capability. Given this we see that an important future task within entrepreneurship is to undertake studies where the level of analysis is shifted from single firms to their extended resource bases. However, in order to generate managerially valuable knowledge, it is important to consider not only the creation of value in networks, but also how this value is distributed between the involved parties, i.e. how to handle the appropriability issue.

A final reflection regards the flexibility of strategic assets. While the ability to conceive multiple alternative ways of using a specific resource or capability is a matter of interpretive flexibility, based on prior knowledge (Shane, 2000), the inherent characteristics of these assets also influence the possibilities to do so. Some assets, such as specific skills, knowledge, patents and brands can be used in more ways than others, irrespective of the entrepreneur's imaginative capacity. Companies holding more flexible assets consequently ought to have larger potential to adapt opportunistically and thereby have a better chance to survive. To address both the interpretive flexibility of an entrepreneurial team, which may be influenced by e.g. the competence diversity of its members, and the flexibility of strategic assets like the ones mentioned above, is a challenging task in need of further investigations.

**Acknowledgements**

The authors would like to express their gratitude to the founders and CEO:s of the studied firms who generously shared their time and knowledge with the interviewers. We would also like to thank the students at Chalmers School of Entrepreneurship for their assistance in collecting parts of the empirical material.



## References

- Amit R., Schoemaker P.J., (1993), Strategic Assets and Organizational Rent, *Strategic Management Journal*, **14**, pp. 33-46.
- Baron, R. A., (1998), Cognitive mechanisms in entrepreneurship: why and when entrepreneurs think differently than other people, *Journal of Business Venturing*, **13**, pp. 275-294.
- Bhave, M. P., (1994), A process model of entrepreneurial venture creation, *Journal of Business Venturing*, **9**, pp. 223-242.
- Bhidé, A., (2000), *The Origin and Evolution of New Businesses*, New York, Oxford University Press.
- Björkdahl, J., Bohlin, E., Lindmark, S., (2001), *Policy and Market Implications of Mobile Internet - A Survey of Critical Issues*, Vinnova.
- Brown, T. E., Davidsson, P., Wiklund, J., (2001) An operationalization of Stevenson's conceptualization of entrepreneurship as opportunity-based firm behavior, *Strategic Management Journal*, **22**, pp. 953-968.
- Brown, S. L., Eisenhardt, K. M., (1997), The Art of Continuous Change: Linking Complexity Theory and Time-paced Evolution in Relentlessly Shifting Organizations, *Administrative Science Quarterly*, Vol. 42, pp. 1-34.
- Cooper, A. C., Gimeno-Gascon, F. J., Woo, C. Y., (1994), Initial human and financial capital as predictors of new venture performance, *Journal of Business Venturing*, **9**, pp. 371-395.
- Dierickx, I., Cool, K., (1989), Asset stock accumulation and sustainability of competitive advantage, *Management Science*, **35**, pp. 1504-1511.
- Edlund, M., Magnusson, M. G., (2002, forthcoming). The Influence of the Dominant Management Logic on an Internal Corporate Venture, *Scandinavian Journal of Management*.
- Eisenhardt, K. M., Martin, J. A., (2000), Dynamic capabilities: What are they?, *Strategic Management Journal*, **21**, pp. 1105-1121.
- Foss, N.J., (1998), The resource-based perspective: An assessment and diagnosis of problems. *Scandinavian Journal of Management*, **14**, No. 3, pp. 133-149.
- Foss, N. J., (1999), Networks, capabilities, and competitive advantage, *Scandinavian Journal of Management*, **15**, pp. 1-15.

Fransman, M. (1994), Information, Knowledge, Vision and Theories of the Firm, *Industrial and Corporate Change*, **3**, No. 3, pp. 49-67.

Gartner, W. B., Bird, B., Starr, J. A., (1992), Acting As If: Differentiating Entrepreneurial From Organizational Behavior, *Entrepreneurship Theory and Practice*, Spring 1992, pp. 13-31.

Grant, R. M., (1991), The Resource-Based Theory of Competitive Advantage: Implications for Strategy Formulation, *California Management Review*, Spring 1991, pp. 114-135.

Hill, R. C., Levenhagen, M., (1995), Metaphors and Mental Models: Sensemaking and Sensegiving in Innovation and Entrepreneurial Activities, *Journal of Management*, **21**, No. 6, pp. 1057-1074.

Lei D.T., (1997), Competence-Building, Technology Fusion and Competitive Advantage: the Key Roles of Organizational Learning and Strategic Alliances, *International Journal Of Technology Management*, **14**, No. 2/3/4, pp. 208-237.

Leonard-Barton, D., (1988), Implementation as mutual adaptation of technology and organization, *Research Policy*, **17**, pp. 251-267.

Leonard-Barton, D., (1992). Core capabilities and core rigidities: A paradox in managing new product development, *Strategic Management Journal*, **13**, pp. 111-125.

Lester, R. K., Piore, M. J., Malek, K. M., (1998), Interpretive Management: What General Managers Can Learn from Design, *Harvard Business Review*, March-April, pp. 86-96.

Lorenzoni, G., Lipparini, A., (1999), The leveraging of interfirm relationships as a distinctive organizational capability: a longitudinal study, *Strategic Management Journal*, **20**, pp. 317-338.

Nelson, R. R., Winter, S. G., (1982), *An Evolutionary Theory of the Firm*, Oxford University Press, Oxford.

Nicholls-Nixon, C.L., Cooper, A.C., Woo, C.Y., (2000), Strategic experimentation: Understanding Changes and Performance in New Ventures, *Journal of Business Venturing*, **15**, pp. 493-521,

Penrose, E. T., (1959), *The Theory of the Growth of the Firm*, Wiley, New York.

Porter, M., (1980), *Competitive Strategy*, Free Press, New York.

Prahalad, C. K., Bettis, R. A., (1986), The dominant logic: A new linkage between diversity and performance, *Strategic Management Journal*, **7**, No. 6, pp. 485-501.

Quinn, R. E., (1985), Managing innovation: Controlled chaos, *Harvard Business Review*, **63**, No 3.

Shane, S., (2000), Prior knowledge and the Discovery of Entrepreneurial Opportunities, *Organization Science*, **11**, No. 4, pp. 448-469.

Sjölander, S., Magnusson, M., Johansson, M., Andrén, L., (2001), Evolution, adaptation and entrepreneurial learning in the emerging Nordic Wireless Internet industry. Paper presented at *The first International Conference on Entrepreneurship and Learning, June 21-24, Naples, Italy*.

Teece, D. J., (1998), Capturing Value from Knowledge Assets: The New Economy, Markets for Know-How, and Intangible Assets, *California Management Review*, **40**, No. 3, pp. 55-79.

Teece D. J., Pisano G., Shuen A., (1997), Dynamic Capabilities and Strategic Management, *Strategic Management Journal*, **18**, pp. 509-533.

Wernerfelt B., (1984), A Resource-Based View of the Firm, *Strategic Management Journal*, **5**, pp. 171-180.

Witt, U., (1998), Imagination and leadership – The neglected dimension of an evolutionary theory of the firm, *Journal of Economic Behavior & Organization*, **35**, pp. 161-177.

## Appendix 1. Summary of case studies

Company	Business area/idea	Founding year	Number of employees	Funding	Changes to business model	Changes to the resource base	Business status
1	Geographical presentation system of information on the Internet	2000	5	2 rounds (VC)	Customer focus	-	Sales
2	Radio base and IP technology	2000	0	-	-	-	Liquidated
3	Networking solution that combines client-side functionality with network server/routers	2000	38	2 rounds (VC)	Sales strategy, customer definition	-	-
4	Transceiver products for WLAN and Bluetooth applications.	2000	40	2 rounds (VC)	-	More focus on technology development	-
5	GPRS dialer that works with all GPRS terminals on a multitude of platforms.	2000	17	2 rounds (VC)	Minor changes, broader customer definition	-	Agreements and trial agreements
6	Built in systems in complex machines.	2000 (Year of merging)	163	1 round (VC)	Back to core business	-	Sales
7	Hardware and software solutions for networking within the Bluetooth standard	2000	35	Several rounds (VC)	Involves hardware	-	Sales
8	Antennas for PDA and other short range wireless products	1997	12	Provided by mother company	-	-	Sales
9	Opinion poll by SMS	2000	1	1 round (VC)	Revenue model, product definition	Employee reduction	Put on hold, minor sales
10	Network programs for PDA	2000	3	1 round (VC)	Customer definition	Employee reduction	Minor sales
11	System for information treatment	1999	19	3 rounds (VC)	Customer definition, product definition	Reorganization of employees	Sales
12	Information producer	1997	3	Soft financing	Customer definition, product definition	-	Sales
13	Information provider	1999	12	2 rounds (VC)	Minor changes, more focused customer definition and product definition	Employee reduction	Sales
14	Appear functions for PDA	2000	7	Soft financing	Revenue model, customer definition, minor changes in product definition	-	Minor sales
15	Communication platform	1999	10	5 rounds	Product definition, customer definition	-	Sales
16	Voice controlled services	2000	9	Loans (NUTEK)	Product definition, minor changes in customer definition	Employee reduction	Sales
17	Mobile Office package	1998	23	Business Angel, 3 rounds (VC)	Revenue model, product definition, customer definition	Employee reduction	Sales
18	Consulting within system development, infrastructure and project management	2000	25	Loans	Customer focus	Employee reduction	Sales
19	Travel assistance	1999	16	Several rounds (VC)	Product definition, revenue model	-	Sales
20	Voice recognition	2000	8	3 rounds (VC)	Customer definition, revenue model, minor change in product definition	Minor employee reduction	Sales

Company	Business area/idea	Founding year	Number of employees	Funding	Changes to business model	Changes to the resource base	Business status
21	One-stop-shopping opportunity for telematic services	2000	3	Several rounds (VC)	Minor changes customer definition	-	Minor sales
22	Hot spot solutions for WLAN access	2000	10	Soft financing and corporate venture capital	Product definition, customer definition, revenue model	-	Sales
23	Platform for net-based services	1999	54	2 rounds (VC)	Product definition, customer definition	-	Minor sales
24	PDA software for clinical medical trials and mobile medical files	1995	25	> 4 rounds (VC)	Product definition, customer definition,	Changed competence base	Sales
25	Software for distribution of IP-based media content to mobile terminals	2000	10	2 rounds (VC)	Product definition, added customer group,	Addition to competence base	Minor sales
26	Planning, design and support of broadband transmission between regional and local infrastructure.	1999	0	Private placements/ Business angel	Customer focus	-	Liquidated