INFLUENCING FACTORS FOR RESILIENCE IN ORGANIZATIONS - A CASE STUDY IN A TRANSFORMATION INDUSTRY COMPANY

kumiko oshio kissimoto (USP)
kkissimoto@uol.com.br
Fernando José Barbin Laurindo (USP)
fjblau@usp.br

The concept of resilience in organizations is relatively new in the business world and refers mainly to the organizations´ ability to remain competitive over time or the capacity to recover quickly from disruptive situations. Among resiliennce influencing factors are the ability to renew itself through innovation, knowledge management, new ways to combine resources, the ability to explore new territories and building a flexible supply chain. An investigation was empirically conducted, through a case study in a single company in the transformation industry, into how these influencing factors found in the literature are present in corporate strategy and how they are disseminated and implemented in the daily companies´ operation. The results showed that knowledge management is a key factor for the company to achieve resilience. The organizational culture and leadership are among the key enablers of knowledge management. The robust spending in R&D and strategic planning aiming long term business steps are the basis for diversification that also ensures resilience. This vision is supported by the financial reports that show that even during the crisis that affected the world, the company maintained a strong growth pace. Through constant market monitoring to detect trends and changes affecting their supply chain and close work with each business unit in each region, the company can quickly redesign its logistics network and to reclassify suppliers and partners to meet the demand challenges. This ensures the collaboration among the supply chain participants, which positively influences the resilience of the company studied.

Palavras-chaves: Resilience, Knowledge Management, Organizational culture

1.Introduction

The business environment has always faced transformations that force managers to think what they need to do to remain competitive. In 1970, Ansoff and Brandernburg (1970) stated that a high priority issue for executives is to think of what the organization should be, in an environment that demands organizations that are flexible and responsive to meet customer needs; to be efficient no matter their size and complexity in order to cope with product diversity in a global basis; to manage human skills as one of the main resources; and to deal with decentralization, centralization and span of control. With all these in place, the urge for strategies that allow new ways of doing business, considering merging with other organizations, divestments and the development of high talented professionals in R&D – considering going across existing organizational boundaries – is high.

After 40 years, those business issues written by Ansoff and Brandernburg (1970) are not only true, but much more intense and rapid. Technological discontinuity, changes in consumer behavior, shortened product life-cycle and entry of non-traditional competitors (Hamel; VÄLIKANGAS, 2003) are some of the new challenges that have added up to the already existing business issues. For years, companies have pursued efficient operations but recent studies have stated that to remain competitive in today's world, to operate efficiently is no longer enough. It is necessary to build a resilient strategy, redefining the organization business models before they are forced to do so (HAMEL; VÄLIKANGAS, 2003; REINMOELLER; BAARDWIJK, 2005; SHEFF, 2005; SHEFF; RICE, 2005; VÄLIKANGAS, MERLYN, 2005).

However, achieving this resilient strategy is not a simple task (HAMEL; VÄLIKANGAS, 2003). Most organizations operate in a defensive manner, so that actions are taken only after some kind of loss has already occurred (VÄLIKANGAS, Merlyn, 2005). The resilient strategy is preventive (VÄLIKANGAS, Merlyn, 2005) and requires some specific skills in both the organization and the individuals who work there.

The aim of this paper is to empirically investigate, through a case study method at a company in the transformation industry sector, how companies cope with the influencing factors that assure them a resilient strategy. The results will show that to have a strong focus on knowledge management, to be open to diversification through merging with other companies and to construct a flexible supply chain are some of the key points that help a company to be resilient over the years.

In section 2, the theoretical background upon which the study is developed is described and in section 3, the research propositions are presented. The research methodology is presented in section 4. The field research based on the research topics and the proposition analysis are described in sections 5. Finally, in section 6, the conclusions are given. It is important to highlight that once the study is conducted in only one company, the generalization of the findings are not possible, but the contribution might be valid, since there still is a lack of empirical works in this subject.

2. Theoretical Background

The concept of resilience comes from research on children's behavior that analyses their ability to maintain a positive, proactive and flexible attitude, despite the extreme adverse environment conditions they live in (REINMOELLER; BAARDWIJK, 2005). Using this concept in business is relatively new; therefore, many discussions are raised about the definition of what resilience is. Table 1 below summarizes some of the concepts about organizational resilience found in the literature.

Table 1 – Some of the resilience concepts found in the literature

Definition	Authors
The capacity to reinvent themselves in a highly changing environment	Hamel and Valikängas, 2003; Hamel and Välikangas, 2003;
The ability to manage risk by being better positioned than competitors to deal with disruptions	Sheffi, 2005
The ability to manage and mitigate risk through creating more resilient supply chains	Christopher and Peck, 2004; Rice and Caniato, 2003
The ability to build redundancy and flexibility in the supply chain	Sheffi and Rice, 2005
The ability to renew itself through innovation combining knowledge management, use of internal and external resources, entrepreneurship and diversity	Reinmoeller and Baardwijk (2005)
The ability of an organization to successfully confront unforeseen events	Sheffi, 2005

Some of these concepts are more focused on redefining business processes through organizational changes which are strongly based on knowledge management and human resource development. Others are more focused in operational issues, such as strengthening supply chain networks. The concepts that underline both definitions are many times conflicting.

Likewise, many are the influencing factors to achieve organizational resilience, but, compiling them, it is possible to list three of them, that in some way can be found in almost all the authors that study this subject. They are:

- The strengthening of the supply chain through flexible processes and in some cases, redundancy and actions that leverage risk management to reduce vulnerability (CHRISTOPHER and PECK, 2004; REINMOELLER and BAARDWIJK, 2005; RICE and CANIATO, 2003; SHEFFI, 2001; SHEFFI and RICE, 2005);
- Diversification as one of the innovation forms, through which companies exploit new markets related or even unrelated with the purpose of seeking new experiences and information to support the company growth (COHEN and LEVINTHAL, 1990; McDONOUGH III et al., 2008; NG, 2007; REINMOELLER and BAARDWIJK, 2005)
- Knowledge management to leverage the organization ability to combine previous knowledge, information and the internal resources in order to transform them into new knowledge that will result in new products and services (BOIST, CANALS, 2004; BRAGANZA, 2004; COHEN, LEVINTHAL, 1990; REINMOELLER; BAARDWIJK, 2005; VÄLIKANGAS, MERLYN, 2005).

The organizational culture – the company vision, objectives, principles and strategies – are the enabling factors that will drive all the movements towards resilience (RICE; CANIATO, 2003; WALSH; UNGSON, 1991).

In the following sections, a brief exposition of the influencing factors is presented.

2.1 Building a collaborative supply chain

To strengthen the supply chain or to build flexibility through the supply chain are some of the key factors found in the literature in order to achieve resilience (CHRISTOPHER; PECK, 2004; RICE; CANIATO, 2003; SHEFFI, 2005). This point is particularly true nowadays, when the supply chain is becoming more and more complex and global. Any changes in the demand or in the supply, affects the operation, sometimes causing disruption.

Rice and Caniato (2003) affirm that creating capabilities within the supply chain enables it to be flexible and to respond quickly to demand or supply changes might create resilience. Among these capabilities are high skilled workers with multiple competences, products with common parts that allow quick changes and adjustments to other manufacturing lines or processes, and the adoption of a clear procurement strategy that gives operation transparency, even when it is necessary to change suppliers.

Other characteristics that might be found in the literature are: to build a relationship among the supply chain participants so that the corporate-supplier and the procurement strategy is aligned (SHEFFI and RICE, 2005); to analyze the participants' role within the supply chain (CHRISTOPHER and PECK, 2004); to build manufacturing facilities that provide process agility and inter-operability; and to have a strong control and risk management system in place so that disruptions might be quickly detected (CHRISTOPHER and PECK, 2004; SHEFFI and RICE, 2005). All these characteristics help to create a collaborative supply chain, and some IT systems such as VMI, CRM, ECR, CPFR, among others, help to foster this collaboration.

Collaboration among the supply chain participants is not a simple task, though. Close cooperation among the participants might help to match the demand and supply, aligning the activities involved in a supply chain management (SIMATUPANG and SRIDHARAN, 2002). The collaboration degree among the participants may also vary, according to the type of relationship and the priorities companies have. According to Spekman et al. (1998), this relationship may be classified into four categories – transactional, cooperative, coordination and collaborative – in which the transactional way means that the relationship is only in one specific task, based on short-time contract and the collaborative way is the one in which there is a commitment among the participants with clear relationship policies and operation transparency.

To build a supply chain that has flexible processes means much more than operation efficiency. It means that there must be coordination in all the supply chain, aiming at collaboration, and this coordination must be planned, directed and intentional, based on the strategic priorities to meet the customer's demands (SIMATUPAND and SRIDHARAN, 2002). Also, in order to achieve this flexibility, some relationships will be in the transactional way and others in the collaborative way, but what will drive these relationships is the perception of the strategic importance and the complexity one company has to another one in the task to meet all the customer's and market changes and demands (SPEKMAN et al., 1998; SIMATUPANG and SRIDHARAN, 2002; VACHON et al., 2009).

2.2 Diversification as a way to achieve innovation

Diversification can be defined as how organizations vary their products and services from a set of resources or the way companies increase their market participation by going through related or unrelated business (NG, 2007). Through diversification, an organization can innovate, either using internal resources or combining new resources. According to Reinmoeller and Baardwijk (2005), resilience can be defined as the ability organizations have to renew themselves through innovation, in which one of the components is the diversification into new markets and products. The importance of innovation is also stated by McDonough III et al. (2008) that say that in order to remain competitive nowadays, organizations have to constantly renew themselves through innovation.

It is through innovation that companies ensure superior performance and sustain this performance over time, that is, being resilient. According to Reinmoeller and Baardwijk (2005), the combinations of specific strategies to achieve innovation is the key factor that ensures a company diversification that will ensure resilient strategy overtime.

2.3 Managing knowledge

Knowledge management is a widely studied field and it can be analyzed at multiple levels - theoretical, strategic and organizational (Braganza, 2004). Here knowledge management is examined in the organizational perspective, analyzing how knowledge is created, stored and disseminated so it can be positively used in an unexpected or in a disruptive situation, helping the company to restore normal operation without suffering major losses.

One of the key points in the task of creating a resilient organization is knowledge, more specifically, the way an organization uses this knowledge, so that it can be used to maintain or to create a competitive advantage (HANSEN et al., 1999; YEH et al., 2006). According to Nonaka and Takeuchi (1997), organizational knowledge can be understood as the ability that companies have to create new knowledge through personal interactions, spread it throughout the organization and incorporate it into products, services and systems. There are two types of knowledge: tacit, which is based on individuals and their experiences, personal knowledge, and explicit, which can be captured, codified, systematized and made available for use.

Hansen et al. (1999) classified these two types of knowledge into two kinds of strategies that companies can adopt: encoding, in which knowledge is carefully codified and stored in a database that can be easily accessed by all the organization and personalization, in which knowledge is focused on the individual, and the transmission is through interactions between people. These interactions are the components that will help organizations to innovate in a systematic manner (NONAKA and TAKEUCHI, 1997), through which new answers and solutions are given, creating value for customers (COHEN and LEVINTHAL, 1990).

Yeh *et al*., (2006) mentions two key factors for Knowledge Management: (i) , IT tools to capture knowledge and disseminate it among the people and within the organization; and (ii) leadership that supports the business strategy and company identity, determining which and how many resources will be allocated to the knowledge management issue. At this point, organizational culture is considered one of the major influencing factors for effective knowledge management within an organization (RICE and CANIATO, 2003; WALSH and UNGSON, 1999; YEH *et al*., 2006). It is through their ideas, beliefs, norms, standards of behavior and environments that experience exchange is encouraged, creating new knowledge.

3. Research propositions

Based on the literature review, the following propositions are raised. For each proposition, there is a research topic (RTn) that drives the field study, as is shown in Table 2.

Table 2 – Research propositions and related Research Topic

Proposition (Pn)	Research Topic (RTn)
P1. Resilient companies work with operation procedures	

and processes that enable flexibility in the supply chain through collaborative relationships (CHRISTOPHER and PECK, 2004; RICE and CANIATO, 2003; SHEFFI and RICE, 2005; SIMATUPANG and SRIDHARAN, 2002).	**RT1**. Collaboration within the supply chain
P2. Diversification through innovation can be considered a resilience factor in the organizations (McDonough III et al., 2008; REINMOELLER; BAARDWIJK, 2005)	**RT2**. Diversification through innovation
P3. Resilient organizations adopt and efficient knowledge management strategy, fueled by the organizational culture and leadership (BOISOT and CANALS, 2004; BRAGANZA, 2004; COHEN and LEVINTHAL, 1990; REINMOELLER and BAARDWIJK, 2005; RICE and CANIATO, 2003; VÄLIKANGAS and MERLYN, 2005).	**RT3**. Fostering knowledge management

4. Research methodology

In order to find the main concepts about organization resilience and the influencing factors, an extensive literature review was made. The case study approach was chosen as the methodological approach, once it is appropriate to investigate phenomena that are contemporary, in which the context is important and on which the researcher has no influence (SOUSA and VOSS, 2001; VOSS *et al.*, 2002; YIN, 2005). The research nature is qualitative and the purpose is exploratory, in order to allow the examination of the concepts related to the phenomena and to discover new facets of the phenomena being studied (FORZA, 2002; VOSS *et al.*, 2002).

The company selection criteria considered were: companies that have global presence, more than 10 years of consistent growth, being representative in its industry sector and having a strong focus in R&D. The data collection followed an approach of semi-structured interviews that were conducted with directors and managers from Business Intelligence and Logistics sectors. The interviews were transcribed in a report format, which were later sent to the companies to be validated, in order to increase the internal validity.

5. The case study

The company chosen has been present in the global market for over 160 years, with operations in more than 190 regions with about 400,000 employees. It is known to have a strong knowledge management focus; it is acknowledged as a key player in its industry sector with heterogeneous business focus aiming at diversity; have a strong growth rate, even during the economic crises that occurred in the last 10 years; the R&D department is a key business unit, annually receiving investments around 5% of the company revenue. It is also known as an innovative company both in products and in business processes. For all these characteristics, this company is considered a very resilient one in the market. The description of the case is made as follows, first presenting the description under each research topic, followed by the related proposition analysis.

5.1 Collaboration within the supply chain (RT1 and P1)

The company´s worldwide operations, the complexity of the nature of its business and the high competition in the market, always forced the company to work the inbound and outbound logistics in a very efficient way. Recently, however, recognizing the crucial role logistics was playing in the company operations, a person with worldwide supply chain responsibility was named in the company Board. This step was a key action in order to consolidate the vision that supply chain management was not just about procurement and distribution among company workers, partners, suppliers and customers, but encompasses the company strategy to maintain the growth, leadership and competitiveness.

In order to ensure collaboration within the participants, in the strategic planning building process, the business units' managers are invited to give their contribution to it. The main suppliers and partners are also invited to make part of the team that will build the strategic planning. In some special cases, with specific customers, this planning is made in partnership, hence the plan can contemplate the customer, the company and the suppliers. Accordingly to Sheffi and Rice (2005), the alignment of corporate strategies with suppliers, partners and customer´s strategies is one of the capabilities that should be built within a supply chain in order to provide it with flexibility.

In order to a company be considered partner or supplier, it is necessary to follow four stages, which are: selection, evaluation, classification and development. After that, a service level agreement is signed, in which all the terms and conditions are provided. Only after this stage is a partner or supplier considered and begins to work in accordance to the company strategic priorities and in compliance with the company standards. There is an evaluation process conducted once a year to ensure the maintenance of the terms and their development. When selecting a partner or supplier, their competence is also observed in order to ensure the right combination of internal and external skills and resources to deliver a product or service to the customer. Two kinds of partners and suppliers are considered – those that are considered worldwide, in order to ensure scalability, standardization and length. The other type is the local one, which ensures agility and suitability to regional characteristics. These points are in accordance with what Christopher and Peck (2004), Sheffi and Rice (2005), Simatupang and Sridharan (2002) and Spekman et al. (1998) say about how to reinforce the supply chain and foster collaboration among participants.

In order to ensure agility, scalability, adaptability and inter-operability of the operations, as in Christopher and Peck (2004) and Sheffi and Rice (2005), the company works with consolidation islands, placed in strategic locations. At this point, either great lots of products might be delivered to be re-distributed in smaller lots to other regions, or might have manufacturing pools so that some strategic products may be produced using standard parts and processes, according to the order status. In this way, in cases of disruption or the failure of one point of the distribution map, another facility can be quickly activated to ensure the supply.

With the points above, P1 can be confirmed. The company studied adopts operation procedures and processes that enable flexibility in the supply chain, one of the key influencers in the organization resilience.

5.2 Diversification through innovation (RT2 and P2)

The company in question has a systematic search for diversification. To do so, it drives the strategies towards innovation, described in Reinmoeller and Baardwijk (2005). The intense use of knowledge management makes employees committed to the acquisition and transmission of knowledge, the re-combination of existing knowledge and its application in the R & D departments.

The long-term strategic planning, which drives the major steps the company takes in order to maintain itself in the leadership, might include the divestment of a still profitable business unit and also the acquisition of another company to complement the skill and product portfolio. Along all the years, since its foundation, it has been one of the strategies the company takes that ensures resilience over time. This point is also described in the studies by Ng (2007) conducted on the way companies increase their participation by going through related and unrelated business. Through these actions, the company is always innovating, which ensures its longevity and competitive position and that result in resilience, confirming the points risen in P2.

5.3 Fostering knowledge management (RT3 and P3)

Knowledge management is permeated throughout the company, being a part of all the processes and principles that drive the business. The company vision, mission and objectives are driven towards fostering knowledge management. The transmission of knowledge is strongly encouraged and the internal processes ensure it. One way to ensure commitment to the transmission of knowledge is the strategic meetings that occur between sectors and departments. Each sector has a best practice process that feeds the knowledge repository. In these cross-section meetings, a specialist from each sector participates to discuss a specific project or product planning. These actions ensure the synergy between areas, the transmission of specific knowledge, adherence to best practices and design of new products, process or services. These interactions are the component upon which innovations are made systematically (NONAKA and TAKEUCHI, 1997; COHEN and LEVINTHAL, 1990).

Another way for the company to ensure the practice of knowledge management and knowledge transmission is the personal evaluation process, which contains incentive plans contemplating self-education and the transmission of knowledge that is evaluated in the 360° evaluation process. If an employee does not fill the requirements, he is penalized in his annual bonus and his boss is also penalized in a major percentage. The higher the degree, the higher the penalty. In this way, the company ensures knowledge transmission and commitment to it at all levels. This point is not specifically covered in the literature, but certainly it is part of the organizational culture and leadership commitment. These points are widely covered in the literature, among them Rice and Caniato (2003) and Yeh et al. (2006).

Studying the company´s last 10 years financial reports, it is possible to attest that even in the crisis that hit the world, such as the Asian and Russian crisis in 2000, the .com in 2001, the terrorist attack to the twin towers in 2001 and the recent subprime crisis that pulled down business worldwide, the company was able to maintain its growth and stability. The consistent application of knowledge in the company´s focus sectors, through the R&D department, responsible for creating products and services with high quality and reliability, is pointed out as the one accounting for the company´s resilience. The competitive advantage is created through the correct application of knowledge, as stated in Cohen and Levinthal (1990), Hansen et al. (1999) and Yeh et al. (2006). In this way, P3 can also be confirmed, stating that resilient organizations do adopt efficient knowledge management strategy.

6. Limitation and Conclusion

The adoption of one analysis unit is not enough to ensure the generalization of the findings, so it cannot be taken as a standard when studying organizational resilience, although the same influencing factors might be encountered in other industry companies with slight variations. Yet to prove this point, more research studies must be conducted.

Organizational resilience is never the result of one specific strategy. It is the conjunction of different strategies based on corporate culture, the use of knowledge management and relationships with suppliers and partners that ensures collaboration among the supply chain participants that will result in resilience. It is possible to see traditional companies, big ones in the market, going down during crisis, though. Many of them do have good practices, but this is not enough.

Therefore, as cited in McDonough III et al. (2008) and Prahalad and Krishnan (2008), the alignment of knowledge management and the innovation policy in product and market, supported by internal processes enable the supply chain collaboration and flexibility probably constitutes the center of a resilient strategy.

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