



A Study Of Relationship Between Generic Strategies And Technological Innovation Towards Business Strategy

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ABSTRACT

Technological innovation has become important prerequisite for firms' survival and growth. This leads to wonder about the position of technological innovation in the firms' managers' strategies of the industrial sector. For this, a qualitative approach based on cognitive mapping was adopted. Research results show that technological innovation is much more integrated into cost leadership and differentiation generic strategies than into intent strategies. Thus, moving from strategic logic based on "product- market" ratio; to strategic intent logic based on mobilizing resources and competencies, is remaining elusive for managers' in Tunisian industrial firms.

KEYWORDS Technological innovation, Generic strategies, Strategic intent, Cognitive mapping

INTRODUCTION

Firm survival and growth condition its competitiveness degree in globalized economy context. At the same time, several theoretical and empirical researches have shown that innovation is increasingly essential for becoming competitive. Particularly, technological innovation must be given prominence in business strategy. Technological innovation has been addressed differently by diverse strategy thought schools. Indeed, we report that there are two strategy conceptions: adaptation conception oriented towards firm positioning and strategic intent conception oriented rather towards firms inside. Innovation is then used differently to explain competitive advantage. However, neither adaptation nor strategic intent conceptions have treated technological innovation business strategies link. In addition, several studies (Laroche and Nioche, 2006) showed that business strategy is influenced by firm manager's values and cognitive structures. Moreover, strategy is a set of

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abstractions in managers' mind; it emerges from ideas and constructs, allowing information processing and strategic decisions making. Given these advances and the preponderant position of technological innovation in strategic field, we propose in this article to answer to the following research question: How is technological innovation integrated into strategies of Tunisian industrial firms? In other words, is technological innovation falling within adaptation strategy or within adaptation strategic intent? Empirical research review on corporate strategy reveals the existence of two approaches types: "objective" and "subjective" strategic approaches. Given that our purpose is to explore, in a cognitive perspective, business strategy and technological innovation link, we will adopt subjective approach essentially based on a query of manager's perceptions of their business strategy various dimensions. To answer to our research problematic, we structured this article as following: we begin delineating technological innovation and corporate strategy concepts and then the relationship between them. Identified relationships allowed making two research propositions. To analyze business strategies and technological innovation manager's perceptions, we adopted a qualitative approach based on cognitive mapping. Cognitive mapping technique enables us to develop cognitive maps from semi -structured interviews conducted with six industrial firm managers. Analysis of cognitive maps has allowed in a first time to identify our principal research concepts as influence and causality relationships between them, which led us in a second time to define technological innovation space in business strategy.

LITERATURE REVIEW

1. Technological innovation: Definitions and typologies

Tremblay (2003) defines innovation as transformation of an idea into new or improved product, business process and new method or service. So, we can first distinguish between invention as a process of producing new ideas and innovation as transforming these ideas into marketable products or processes. In fact, innovation has certainly technical background, but it is the economic value that incites firms transforming ideas into new products and processes. Technological innovation is based on technology. It transforms this technology into response to internal or external user needs. Technological innovation is to be distinguished from other innovation types requiring neither scientific nor technical progress such as commercial innovation and organizational innovation. Most authors (Song, Xie, 2000; Herrmann et al, 2007; Corbel, 2009) assign innovation a newness connotation, nevertheless, debate persists about the question "Innovation as newness,,new to whom?" (Johannessen and al., 2001:p1) Some researchers evaluate technological innovation regarding firms and believe that it involves adoption of an idea that is new to organization. Consequently, novelty refers to creating and acquiring product or service that is new to the unit adopting this one (Damanpour, 1991; Johannessen and al. , 2001). Other researchers

(Muller, 2005; Herrmann et al, 2007) advocate that novelty assessment is relatively to market and consider that technological innovation is market introducing of new products. Others like Souitaris (2002) council the two points of view and suggest that technological innovation occurs when a firm has to market new or changed product or when it adopts new or changed processes. Consequently, we believe that both firm's or market's evaluation of technological innovation enables to distinguish between two types of technological innovation: radical innovation and incremental innovation. Based on technological innovation scope, we can differentiate product innovation and process innovation. Product innovation provides market of product or service, with at least a novelty compared to existing products or services, so that novelty is perceived by customers (Loilier and Tellier, 1999). According to "Oslo Manual" (1992: 37), a technologically new product "is a product whose technological characteristics or intended uses show significant differences compared to previous products. Such innovations can involve radically new technologies, or technologies based on combining existing technologies in new applications, or resulting from leveraging new knowledge". Process innovation means transforming industrial processes to design, produce and distribute products and services (Tarondeau 1994). This requires the use of new techniques for manufacturing new products or improving existing ones (Dubuisson and Kabla, 1999). Boynton and Victor (2000) argue that product/process innovation distinction is not systematic and propose four combinations crossing product and process innovation on one hand, and corresponding progressive and revolutionary change on the other hand. Firm is then, either in a mass production system, or in "invention", "development", "dynamic stability" situation.

2. Business strategy: From adaptation to intention

According to Chandler (1996), business strategy is "determination of the basic long-term goals and objectives of an enterprise and the adoption of courses of action and the allocation of resources necessary for carrying out these goals". Early in 1990s, a new strategic paradigm was stood out in strategic management field. Indeed, strategic analysis which was mainly based on firm-environment adequacy or strategic fit, was transformed into strategic intent based on manager's deliberate will (Prahalad and Hamel, 1990)

Porter's generic strategies as coping strategies Strategy involve adaptation to environment to gain market dominant position and defend it. "SWOT" model analysis has been the basis to define and develop coping strategies. Then, other strategic analysis models was appeared and ended with Porter's model. This model included, coherently and in detail, all strategic researches' advances and contributions developed since sixties (Métais and Saias, 2001). In fact, according to Porter (1990), for a given strategic business unit (SBU), three major and exclusive strategy families are conceivable: differentiation, cost leadership and focus strategies which are presented in the following table:

Table.1 The three Porter basic strategies

		Strategic advantage	
		Product uniqueness is perceived by customers	Firm position tcharacterized by low costs
Strategic target	The whole sector	Differentiation strategy	Cost leadershipstrategy
	A particular segment	Focus strategy	

Cost leadership strategies involve firms which aim to obtain lower costs regarding to their competitors, by sustaining product perceived value (Mathé, 2001). Cost leadership strategies orient all firm efforts to an overarching objective which is to minimize total costs (direct manufacturing, conception, marketing, distribution, investment, and administration costs). According to these strategies, the most competitive firms are those which have the lowest costs. These firms' competitive advantage is depending on their ability to minimize costs (Strategor, 1998). Allaire and Firsirotu (1993) situated cost leadership strategies in a strategic dynamics as market strategies based on cost advantages' search and introduction because of buyers' sensitivity to the lesser price variations. Firm competitive environment (industry volume, market) and firm management methods are favorable conditions to implement cost leadership strategy (Mathé, 2006). Management aims to make the best use of three cost effects: volume effect, scale effect and experience effect (Strategor, 1998; Mathé, 2006). Differentiation strategies aim to offer product or service perceived as unique and differentiated by customers in the whole sector (Helpher et al., 2006). Firm differentiation strategy is based on perceived value seeking or optimum use product or service value (Mathé, 2001). Thus, firm activity should have industrial positioning on the one hand, and market positioning of the other hand. In addition, differentiation sources are various: product or service (intrinsic value, functionality, performance and design product) and product associated services (rapid response to customers' needs, installation customers' advisory, staff competencies, customers' contact, maintenance service). Firm image is also a source of differentiation using symbols, atmospheres or events. Porter chain value (1995) is a useful element to look for differentiators' factors. Focus strategy concerns a particular market segment defined as a group of consumers or products. Having a single target allows firm to make use of either cost/differentiation leadership, or both simultaneously (Helpher et al., 2006). It is a niche strategy in which a new firm targets a group of buyers it considers underserved by generalist firms (firms with broad strategies). This new firm has the advantage of being ready to focus on a group of buyers less interesting to product generalist firms. This strategy is based on incumbent's negligence or indifference or the fact that strategic or operational constraints prevent generalist firms from well serving some buyers or territories segments (Allaire and Firsirotu 1993). Thus, Porter's approach considers that strategy is based on firm environment adaptation that is important to all firms. This point of view has been criticized especially regarding to changing environments and the expansion

of some emerging markets. The spread of competition had been deterring firm's competitive advantages making them unable to defend their competitive positions.

Intent strategies

Hamel and Prahalad (1999) were the first researchers to show limits of Porter's approach and to substitute a new based strategic intent philosophy. In the 1990s, this new way of thinking is built by focusing primarily on firm inside. Its watchwords are intention and movement. In this case, strategy aims permanently to transform competitive and business game (Métais and Saias, 2001). Firm performance is more a possession of strategic resources than careful positioning choice in particular attractive industries. Firm resources' predominance and internal characteristics define a new way of strategy thinking that places firm as central in strategy formulation, which aim is to change environment game rules and create new competitive spaces. Intent strategy principle is to build strategy, not by analyzing and reacting to environment, but rather, by creating new competitive opportunities through firm resource and specific skills analysis and exploitation. The emphasis is not on products and activities firm positioning, but on its organizational and human resources as well as their individual or collective know and know-how. This intent strategy philosophy is based on two assumptions: first is to follow a very ambitious long-term vision, and secondly, to expand basing on portfolio core competencies (Métais and Saias, 2001). These firms vision is to set excessive ambitions for the future compared to their current resources state (Hamel and Prahalad, 1994). To achieve goals, each firm mobilizes unique resources and skills portfolio. Hence, intent strategies involve Resource based view and competence based view. Resource based view (RBV) is a research theoretical stream structured around the concept of resources. It aims to accurately define resource notion and to understand the resource-competitive advantage link (Métais and Saias, 2001). For Schoemaker and Amit (1993: 35), resources are "the stock of available factors owned or controlled by a firm". Barney (1991: 101) suggests classifying firm's resources into three categories: Physical (technology, plant and equipment, geographical location and access to raw materials), human (employees' training, experience, judgment, intelligence, relationships, and individual perspicacity) and organizational (structure, formal and informal planning, control and coordination systems) capital resources. Resources have several characteristics: they are specific to a firm, complex, tacit and based on causal ambiguity. These characteristics make resources difficult to identify and imitate by competitors (Arrègle, 1995). Indeed, firm resources are characterized by imperfect mobility. In fact, more a resource is imperfectly mobile, more strategic it is because it is likely to lead to competitive advantage. Competence based view considers firms as a set of skills that should not be limited to routines or resources and capabilities. In fact, resource allocation and organizational capacities are not sufficient to create competitive advantage. More specifically, it is through the interaction between knowledge and routines on the one hand, and technology assets and resources on the other hand, that competencies

construct was developed. Competencies are based not only on information and knowledge, but also they must incorporate factors resulting from learning processes (know-how) and attitudes (know-being) (Durant, 2000). Quélin (1995) considers that in an organization, there are three levels of competence integration: a basic level, which includes competences related directly to firm operational activities (know-how production, etc. ...), an intermediate level where specialized competencies are aggregated into functional skills (e.g. marketing), and a higher level, where competencies involving a wide intra- or inter- functional integration and competencies that affect the whole organization (coordination and decision processes). According to competence based approach, developing strategy is not articulated around all competencies, but around only core competencies. Prahalad and Hamel (1990) defined core competence as collective learning of an organization, particularly, how to coordinate diverse production skills and integrate multiple streams of technologies.

3. Place of technological innovation in business strategies

Relationship between generic strategies and technological innovation

Kim and Choi's (1994) study on relationship between "strategic types" and Korean SMEs performance, have distinguished sixteen competitive dimensions grouped into four broad strategies (cost efficiency, innovation differentiation, marketing differentiation, asset parsimony). D'Amboise (1993) showed that these concepts have allowed identifying Korean SMEs strategies. Based on Porter's approaches, Campbell-Hunt (2000) proposed an analytical framework (instead of a normative model) to represent firm strategy. In this "dimensionalist" approach, constituent factors of the three Porter's competitive strategies (Product originality in differentiation strategy, strict control of production processes in cost leadership strategy) are all "competitive dimensions" which describe firm strategic "design" (Campbell- Hunt, 2000). In this perspective, Le Roy and Torres (2001) have proposed a set of associations between different "competitive dimensions" and the three Porter's competitive strategies (Cost leadership, differentiation and focus) (See Table 2):

Table. 2: Porter's competitive strategies and corresponding competitive dimensions

Competitive strategies		Associated competitive dimensions
Cost leadership strategy		Cost control, innovating production processes, investing in new equipment, reducing direct costs, minimizing indirect costs, economies of scale, full exploitation of production capacity.
Differentiation Strategy	Product Differentiation	Product originality, product quality, product innovation, product technology, customer service, R & D.
	Marketing differentiation	Sales force, advertising, promotion, sales promotion.
Focus strategy		Focusing on a segment, product specialization, unit margin rate

Accumulating experience allows firms to make product changes, eliminate redundant elements or manufacture with more economic components. Furthermore, firms can

gradually replace labor by other production means (capital / labor substitution) to improve manufacture process. Generic strategies -technological innovation relationship is also experienced in sectorservice firms' that are sensitive to economies of scale, expert in learning effect and can make innovations so that they reduce costs. Hence, technological progress have important role in generic strategies -technological innovation link allowing process and product innovations (Helfer et al. , 2006; Mathé, 2001) and therefore, decreasing costs . Differentiation strategy may be the result of an innovation management system or product/process innovation. Therefore, this is our first proposition: Proposition1: Technological innovation is an adaptive response to environment that is: a) Technological innovation involves cost leadership strategy b) Technological innovation involves differentiation strategy c) Technological innovation involves cost leadership strategy 2. Relationship between intent strategies and technological innovation Using new resource combinations, resource based view enables firms expanding resources and innovating. In resource-based view, diagnosing consists in assessing firms' resources to identify products obtained from existing resources, and seeking new ones that could be made from new combinations of existing resource or possibly by linking with additional resources. Penrose (1999) notes that resource combination as defined by firms generates "productive services" those are specific to each firm and source of firm heterogeneity. Highlighting new productive services can be source of new innovations. Resource combinations consist of either new service combination for new product manufacture or new processes to manufacture existing products, or new organization of administrative functions. Durand (2000) considers core competencies as competence recombination's that allow firms to design, manufacture and distribute new and different products and services for customers in different markets. Karray (2003) and Kammoun (2004) studies' conducted with French SMEs showed competences' positive effect on technological innovation. Market-oriented competences enable firms to abandon adaptation defensive - reactive strategy when designing new products and changing towards proactive-aggressive strategy (Herrmann et al., 2007). Thus, we can emit a second proposition: Proposition 2: Technological innovation is resulting from strategic intent

Sales Force Case Studies

Marc Benioff created Salesforce.com in 1999. He developed the idea while on sabbatical in Hawaii and India as a former executive at Oracle. After observing the success of consumer websites such as Amazon.com, he saw the Internet's potential to be a goldmine for business consumers and embarked on his plan to launch his own startup business. His initial venture, after considering a human resources company, was Customer Relationship Management (CRM), with the premise that his software would be simple to use and inexpensive, a major advance over similar things existing on the market. Salesforce.com has evolved into a

platform for business owners and managers to purchase software licences for a variety of business applications such as service and support, marketing, and, of course, sales.

Salesforce competes in the Cloud Computing industry in addition to the CRM market. While these organisations' cloud offerings vary widely, their product offerings differ in that some are value-added products and others are collocation products. A collocation product is a cloud service that simply provides for more processing power. On the other hand, value-added refers to a cloud service that not only improves performance but also increases developer productivity or delivery. This category includes Salesforce, Google, Amazon, and Akaimi. Google and Amazon provide a platform for using applications, but Akaimi provides a platform for expediting application delivery. Salesforce.com combines the two by providing a platform for developing applications and then delivering them through AppExchange.

METHODOLOGY

1. Cognitive mapping

Cognitive mapping is experiencing a growing interest in strategic management research which is increasingly recognizing the role of intuition, judgment, vision and importance of manager's cognitive universe in business strategy development. Analysis of managers' cognitive universe allows studying individual knowledge in terms of perception, interpretation, attention, memory and learning. Cognitive mapping method considers that individual cognitive structures are value's systems and causal thoughts. This method was developed in strategic management field by Eden et al. (1999). It helps developing cognitive maps (Eden et al., 1993) which are modeling of thoughts considered as factor's networks and guidelines relationships between these factors. Cognitive maps are figures, images, graphic representations of statements or speeches. They can be distinguished from other map types such as strategic maps (study of organizational structures), composite maps (resulting of individual map's set accumulation) and collective maps (social representations relating to individuals).

2. Sample and data collection

Our sample is composed of six industrial sector managers. We choose industrial sector in which firms are, more than in other economy sectors', led to innovate to meet globalization context competitiveness requirements. Furthermore, these firms are succeeding both on national and international markets. Respondents were managers or CEO's committee member involved in strategy formulation. In fact, managers especially in SMEs are strongly

influencing conduct of business and are considered as the main actors who choose strategy, initiate and implement innovations. Analyses of manager's cognitive representations tell us about the place they give to technological innovation. Thus cognitive mapping is very useful in this case. We used a sample of managers who has agreed in advance to participate in our research; consequently, we employed open in depth interview method. For this purpose, we simply asked managers the following question: "What is your business strategy"? Such question helps managers to freely and spontaneously express their business competitive environment perceptions and allows us to explore how they develop their business strategy. In addition, open-in depth interview is a well-accepted by managers; it allows obtaining concepts and relationships that are important for managers. In addition, it is widely used by researchers analyzing manager's cognitive maps (Hackner 1991; Cossette, 2003).

3. Construing cognitive maps

To draw cognitive maps, we used "Decision Explorer" software that helps to organize and analyze qualitative information. Information may be simple and straightforward ideas that require further exploration and examination, or complex ones and concerns events to be structured and analyzed to manage complexity. In both cases, "Decision Explorer" software "provides a framework that "facilitates" decision making. "Decision Explorer" maps are made from short phrases (concepts) whose relationships are indicated by links between these concepts. Concepts and relationships are introduced by the software user; they can be moved, edited, given different views and styles, assigned to groups and we can analyze the whole model. To develop cognitive maps, we followed three phases: Firstly, we analyzed interviews transcripts according to two analytical dimensions which are the concepts describing the firm strategy and innovation and the links between these concepts. Then, we evaluated the importance of each concept for the manager interviewed by relying on four evaluation criteria (Calori et al., 1994). Finally, a map was drawn for each manager explaining business strategy and firm technological innovation type (See figure 1):

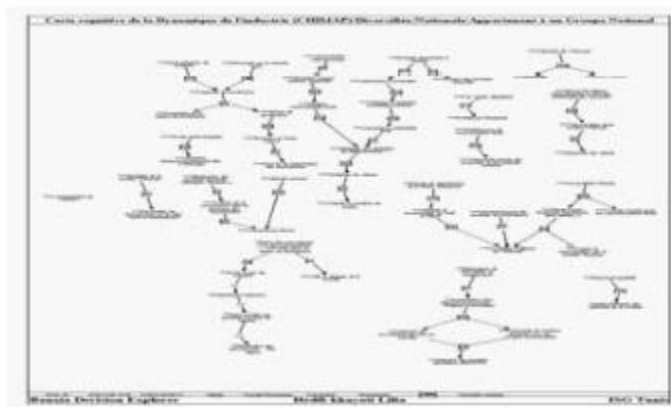


Fig.1: Example of a manager cognitive map

CONCLUSION

Recently, strategic thinking background is related to the so called “traditional” conceptions based on adapting and finding adequate product-market positioning, but also to conceptions based on resources and competencies mobilization to operate in business market. Our objective was to explore –in Tunisian industrial sector- the place of technological innovation in business managers’ strategies. To this end, we used qualitative study based on cognitive mapping. Our research results showed that firms innovate to improve their market competitiveness. Technological innovation is much more integrated into the framework of cost leadership and differentiation generic strategies than into strategic intent one. For managers cost and quality competitive advantages are very important, they aim to satisfy their customer’s needs at the expense of making new products or processes that might disrupt customers’ habits. Even, technological innovation is integrated into intention strategy context, aims to make advantage of arising opportunities and especially, to adapt products or imported materials to Tunisian context without having a real technological innovation strategy. A shift from a strategic logic defined in terms of “product- market” to a strategic logic defined in terms of intentions, resource and competencies mobilization remains elusive for Tunisian industrial sector firms.

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