

The Significance of Information Systems in Enhancing Strategic Agility within Supply Chain Context: A Case Study of Telecommunications Industry

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ABSTRACT

The ability of a company to either adapt to the changes in the business environment or to influence the environment, for example by innovations, determines its success in gaining competitive advantage or even survival in the contemporary business environment. Both scholars and practitioners are constantly devising ways to survive the environmental pressures, such as, information overload, technological advances and obsolescence and globalization. This research proposes strategic agility comprised of strategic sensitivity, strategic response and collective capabilities as one such business virtue required. One such competitive and complex industry is Telecommunication industry and this study makes use of a company in that industry to investigate strategic agility and information systems (IS) role in promoting strategic agility. In addition, the supply chain setting is considered because of its significance in the industry as one of the competitive factors. The research revealed different points of view for the role of IS from business and information technology (IT) managers. The value of strategic agility is appreciated by both sets of managers. However, the managers have different views on the value of IS in promoting the strategic agility dimensions, for instance, most business managers highlighted that IS is of no strategic value and one even claimed it is the worst performing function. But IS managers noted that, IS, for instance, business intelligence and enterprise resource planning systems could be utilized hand-in-hand to support strategic agility. Moreover, this study make use of dynamic capabilities view in drawing both strategic agility dimensions and IS input. This study contributes to the ever required knowledge on how business could make use of IS and adapt organizational features to the environment requirements in order to survive the competition.

KEYWORDS: strategic agility, strategic sensitivity, strategic response, collective capabilities, Information systems role, supply chain, telecommunication study

1.0 INTRODUCTION

Growth and survival of companies in the contemporary business environment largely depend on how well the companies understand and relate to the dynamic and increasingly complex business environment. For example, changes in the mobile phone industry like increase in smartphones market segment was well understood and catered for, for instance, by Apple's iPhone and Google's Android based devices like Samsung phones dominate the segment because of their innovation in line with the changing environment requirements. The environment has been increasingly dynamic due to advances in technology, globalization and high rate of innovation in some industries [1-9]. There are many measures business can take to relate to the environment in order to gain competitive advantage. This research aims to investigate one such business virtue, titled strategic agility. Strategic agility involves tactfully sensing and responding with ease, speed, and dexterity to business environment. Moreover, the prevailing technological advances bring challenges and opportunities to business. This research contributes to the ever dynamic and required knowledge on IS role in promoting business and past literature offers opposing views on the strategic value of IS. For instance one view is that IS, such as though social computing tools like blogs and wikis offers strategic value. Another view is that IS offers no strategic value. Additionally, one of the business responses to an increasingly competitive environment is formation of supply chains (SC) [10-18]. It is also argued that business competition is now at SC level. This is also due to the global nature of the business environment in addition to technological advances which enable quick and cheap communication and collaboration. SC involves systemic, strategic coordination of the traditional business functions and the tactics across the business functions within a particular company and across businesses within the SC, for the purposes of

improving the long term performance of the individual companies and the SC as a whole. After conducting a systematic literature review (SLR) following guidelines, we noted that there have been calls in the literature to study agility from different dimensions. The SLR uncovered wide research which highlights the increase in competition in the business environment, for example, calling for agility research [19-27]. Moreover, we also noted that there have been efforts to relate agility to information systems (IS) like many projects and these studies concluded that IS play crucial roles to promote agility. In addition, research covered agility in SC setting. However, we noted a gap in literature of the research which relates strategic agility and the role of IS in SC setting. This is important because of the increasing complexity of the business environment which needs to be analyzed considering all these factors (strategic agility, information systems and supply chains). Moreover, there is a need to include empirical component to the agility study in order to relate research and practice. Table 1 illustrates the evolvement of agility related research. From the research in Table 1 we note how agility research incorporated different factors in drawing and mapping the value of agility for improved business performance [28-42].

2.0 LITERATURE REVIEW

This section elaborates the research themes namely strategic agility, SC and the role of IS. In addition, two theories are explained namely Porter's five forces that shape industry competition and dynamic capabilities. These theories address the external and internal factors in competing in a dynamic environment. Basing on a dynamic competitive business environment projects suggested the need of strategic agility. They proposed strategic sensitivity, resource fluidity and leadership unity as main dimensions of strategic agility. However, after noting other literature, some researches expanded the dimensions of strategic agility to be strategic sensitivity, strategic response and collective capabilities, illustrated in Figure 1 [1-17].

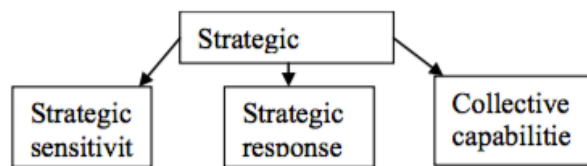


Figure 1: Strategic agility dimensions

Strategic sensitivity is the ability to draw useable data from environment, incorporate data into information, interpret and analyze to acquire knowledge and then detect opportunities and threats in the business environment. Strategic response is the ability of an organization to impeccably and quickly (re)configure its resources and processes to re-act or pro-act to the business environment demands. Collective capabilities include the ability of an organization to take advantage of the synthesis of its resources, for example, information, employees, infrastructure, partners and to succeed on the gains of working together, this is more than each resource's benefits individually summed up [18-29].

A supply chain involves business processes that include goods production or services formulation from suppliers to the end-customers. Customers places orders which flows from distributor to last tier supplier and this triggers goods or service formulation from the successive SC members until the customer is served as per order as illustrated in Figure 2. In addition, SC can also be innovative and produce new goods or services which could disrupt the market. A SC is comprised of, for instance, enterprises, vendors, distributors, manufacturer, and supplier-1 until the last-tier supplier. Products whose formulation is from the last-tier supplier and delivered to the customer are administered by SC management who acts in two levels SC level and organizational level. At SC level management tackles the issues that make the chain effective and efficient and on organizational level they make sure that the organization is functioning as required by the chain. Their choices include determining structure, process and as well as SC partners. Information sharing is a vital component of the SC and information should be available to all SC partners in transparent manner [30-37].

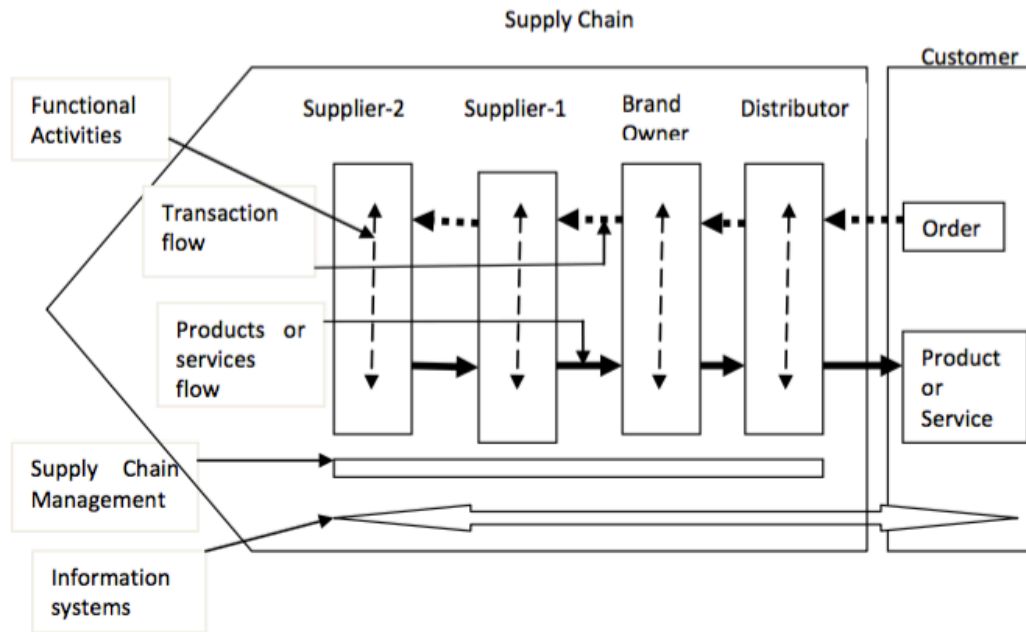


Figure 2: A general supply chain management model

There are mixed views from both practitioners and scholars on role of IS in business performance and hence efforts, on drawing measures to evaluate IS costs and benefits. For instance, there has been wide audience of both critics and promoters on argument that IT does not matter. He argued that IS, like electricity, is being a commodity which is of no competitive advantage. Some business personnel of the company in this study shared the same views. However, many noted that there is vast IS research which empirically concluded that ISs are of operational and strategic value. Projects concluded that the role of IS in business is crucial But scholars also differ in arriving to this conclusion. noted that there are two approaches first, that IS impacts directly business performance, for example, media company with its suppliers. The second approach is that IS indirectly impacts business through organizational features, such as, strategic agility and this study concur to this view. Researchers suggest that strategic agility is required in a competitive business environment, which is prevalent in the current environment. Specifically, this research seeks to highlight IS task in enhancing strategic agility, which is a business imperative especially in a competitive environment [35-43].

3.0 RESEARCH METHODOLOGY

This study is a qualitative survey based research which includes interviews from the same company as elaborated below. Proects, highlighted the value and contribution of qualitative approach in IS research, for example as is the case in this research, in a highly complex and turbulent context, rich data can be generated that enable answering research questions comprehensively. Data collection and analysis. The selection criterion of the company include operations in highly competitive environment in a supply chain setting and is undergoing transformation thus visibly making efforts to survive or lead the market. Table 1 illustrates the list of people who participated in the research from Net Power. The participants were selected so that they offered diverse knowledge which is of interest to the study, for example, IS application for business and daily use, strategic agility as well as supply chain aspects. Net Power was going through restructuring at the time of the research and, for instance, interviewee 1, Senior Architect was not certain about his function. The interviewees are senior company employees with vast experience in the industry and have great influence on the company operations. The interviews focused on business aspects or IT aspects and in some cases both aspects depending with the profile of the interviewee. The interviews were semi-structured in that a set of guiding questions were drafted before the interview to provide focus. But the interviews were not restricted to the questions as issues perceived as important raised in the interviews were further elaborated. The duration of the interviews was approximately one hour each. The main questions of the interviews included: (Strategic sensitivity related question) what are the measures the company takes in understating and recognizing

trends in the business environment? (Strategic response related question) How does the company respond to the strategic matters uncovered? (Collective capabilities related question) What are the essential capabilities in sensing and responding to the environment? What is the role of IS in all these efforts? These questions were further expanded considering SC setting.

Table 1: Interview participants

Interview w ID.	Functional Area	Title and duties	Experience	Interview focus
1		Senior Architect - Business architecture development.	About 6 years in the industry	business and IS aspects
2	Research and Development	Head - Research to ensure the future technology competitiveness of the organization.	More than 5 years in current position	business and IS aspects
3	Software Platforms Architecture	Manager - How IT tools are used and how they can be changed in the organization as seen from a software business point of view.	About 15 years in the industry	IS aspects
4	Business Enhancement	Head - Responsible of developing innovation research projects in collaboration with partners and public R&D (universities, VTT).	About 15 years in the industry	business aspects
5	New Business Development	Head - Looking for new business opportunities with customers in Nordic and Russia region.	About 7 years in the industry	business aspects
6	Information management	Principal Engineer – Evaluation of Enterprise Architecture approach (methods and frameworks) and its application for future communication services business.	About 20 years in the industry	business and IS aspects
7	New Corporate Projects	Head - Driving new business domains and business models for the Organization.	About 20 years in the industry	business aspects
8	Information Systems Strategy	Head - IS strategy development, execution and communication and creation and implementation of IT competence and change management frameworks across IT.	About 10 years in the industry	IS aspects

4.0 RESULT

Most of the interviewees acknowledged the importance of understanding the environment as well as the business trends. The head of new corporate projects entitled with developing new businesses stressed that new businesses are mostly created because of some changes in the market and thus the importance of strategic sensitivity. Moreover, Net Power has well established policies on customer intelligence, requirements gathering and customer feedback collection, thus well established strategic sensitivity capabilities. There were contrasting views on the value of IS for strategic sensitivity by the interviewees as illustrated in Table 2. For instance the Senior Architect suggested that business intelligence systems for competitor analysis are key systems to keep up to date in the dynamic business environment. But the head of research and development urged that IS are not yet intelligent enough to produce knowledge; they are more for collecting data and disseminate it. Dynamic capabilities emphasize the need of distinctive processes that offer competitive advantage. And from strategic sensitivity point of view such firm has sensing skills made up of difficult-to-imitate combined technological, organizational and functional skills and management capabilities. Thus the effectiveness of technology for strategic sensitivity depends on how well is the fusion with other factors, such as, organizational competences.

Table 2: Strategic sensitivity and perceived IS role by business and IS Managers

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	Business Managers	IS Managers	Dynamic Capabilities View
Strategic sensitivity	Sense all the important players in the environment	Smart and ubiquitous systems that notes the strategic changes in the environment.	Distinctive processes for gathering and analyzing competitive actors and factors.
Perceived role of IS for Strategic sensitivity	Of no strategic value, only operational	Unavoidable e.g. business intelligence systems for forecast and thus strategically important	Technological skills combined with other technical, organization and management capabilities to foster sensitivity.

Most of the interviewees suggested that strategic response is the most difficult step in practice. After successful drawing data from the environment to respond to strategic events when they are realized is a key challenge. Nevertheless, Net Power Principle Engineer argued that firms that are able to react fast on changing condition on changing ecosystems are the ones who will be successful in the future. Software Platforms Architecture Manager suggested that the current execution state of Net Power is not optimal because of the state of the company (restructuring process). Moreover the response has to be related to actors and factors in the industry, such as, competitor’s actions and regulations – as elaborated below.

Table 3 notes the different views from business and IS managers on strategic response. From an internal orientation response initiatives essential from the environment pressures include company rearranging and more focus on the customer. The restructuring effort which Net Power is engaging is an example of a response action. In addition ERP systems play a crucial role in enhancing strategic response from internal orientation. However, Software Platforms Architecture Manager noted that Net Power competitors invest more in research and development and can easily and quickly replicate concepts. External response orientation could be either an action to influence the environment or an action in reply to the environment pressures. Innovation efforts are an example of a pro-action to influence the business environment. All the interviewees acknowledged the value of innovation in the company as well as in the industry. Dynamic capabilities highlight the strategic value in “timely responsiveness and rapid and flexible product innovation, coupled with the management capability to effectively coordinate and redeploy internal and external competences.” In addition, dynamic capabilities view calls for the renewal of competences in line with the dynamic environment which relates to strategic response. Technology is both a push and pull factor from a strategic response perspective in that technological innovations drives the environment, that is, environmental pressure and on the other hand firm can make use of technology as a response effort.

Table 3: Strategic response and perceived IS role by business and IS Managers

	Business Managers	IS Managers	Dynamic Capabilities View
Strategic response	Either fast follower or leader but leader strategically plausible.	IS based coordinated response efforts.	Efficiency based approach which includes evolution path adopted by firm based on its assets positions.
Role of IS for strategic response	Of no strategic value, only operational	Essential especially for internal integration of the response measures e.g. ERP	Push and pull technological factors in the business environment.

There is a challenge in the use of group collaboration technologies (collaboration systems use immature) in Net Power as noted by the interviewee 1, Senior Architect. But there are some collaboration tools (groupware) in the company, such as, discussion forums which are very important in research and development (R&D) as well as to support teams which work from different places. The purpose of the collaboration technologies is not clear but nevertheless social technologies are existent, for example, Net Power connect and Net Power Tube. But the social technologies are only used internally, that is, there is no use in relating to the external environment but there exists an extranet link with customers in which they use an identity and password to access vital information and downloads (Interviewee 2). The interviewees gave mixed views on the use and value of social technologies, such as, wikis, blogs, Net Power connect (internal social network system) on promoting collective capabilities, such as, information management and organizational learning. The head of IT strategy and organization development acknowledged the initial steps the company is taking in trying to gain value

5.0 DISCUSSION

Figure 2 which illustrates Net Power SC and competitive environment is closely related to the five competitive forces that shape industry competition model proposed by Porter (2008). The five competitive forces that shape industry competition are rivalry among existing competitors, bargaining power of suppliers, bargaining power of buyers, threat of new entrants and threat of substitute products or services. Figure 2 also take into consideration additional constructs, such as, other business environment factors that shape the competitive environment, for example, uneven market place due to government backing, restrictive regulations, and high rate of innovation and obsolescence. The practical implication of this is that a firm has to consider all the actors and factors in analyzing the competition. And the influence or competitive value of the factors and actors varies in different industries. In telecommunication industry competition has mainly focused on the price which argued that it is destructive to profitability as price competition transfers profits from industry to customers.

Dynamic capabilities views aim to draw measures that brings competitive advantage in dynamic marketplace. This is the same aim as this study thus specific dynamic capabilities input are utilized to categorically input into strategic agility dimensions strategic sensitivity, strategic response and collective capabilities as well as in SC settings. This is important in drawing a conclusive input to the different views of business and IT managers. Dynamic capabilities made up of a combination of resources that could be readjusted in line with the changing environment. addresses how processes generated could be utilized in enhancing strategic agility dimensions. For example, researchers argue that dynamic capabilities are identifiable processes which are visible, for example, product development, strategic decision making and alliances. Projects suggested that processes, positions and paths available to an organization determine its competitive advantage. That is, paths available for an organization depending on the managerial and organizational process mapped by its assets position define the competitive basis of the firm. Organizational and managerial processes enable collaboration and learning is fostered in the experience. In addition, the processes should be reconfigurable due to the required transformational capabilities because of the changing nature of the environment. The implication of the dynamic capabilities to the strategic agility reasoning includes, for instance, strategic agility dimensions specific dynamic capabilities need to be developed inclusive of all important factors, such as, organizational, functional and technological to create unique processes that are difficult to imitate. In SC context dynamic capabilities should be tailored made in line with strategic agility settings of the chain.

6.0 CONCLUSION

In today's highly competitive business environment companies have to draw measures to gain competitive advantage and even to survive. This research proposed use of strategic agility to gain competitive advantage and this was reinforced by dynamic capabilities approach. Moreover, the agents and factors from which competition is drawn are also developed from Porter (2008)'s five competitive forces that shape industry competition. The role of IS in enhancing strategic agility in SC setting is highlighted in this research although different views are noted business and IT managers. IS makes a difference in a competitive environment especially in SC setting. For instance, IS which enables cost efficiency and allows you to be agile, to get information fast and supports you in making changes fast e.g. changes in R&D programs, changes in your business models e.g. changes in pricing models. Net Power has tools that support pricing, that is, how products are prized. Moreover, Net Power mostly make a deal with customers that have different kinds of products and needs tools that support this globally. It is very important that technology supports because in a global business with many complex products which are combined in different ways there is a need to have very good IS support to be able to be strategically agile.

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