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24th Australasian Conference on Information Systems, 4-6 December 2013, Melbourne

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Understanding Organisational Use of IT/IS for Demand and Supply Chain Management in a MNC Pharmaceutical Company

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Abstract
Demand supply chain management (DSCM), which integrates market segmentation with supply chain strategy supported by proper alignment in organizational configuration, is regarded by researchers as the next stage of evolution of supply chain management. Through an exploratory case study of the pharmaceutical industry, this study investigates the role of information systems / information technology (IS/IT) as an enabler of DSCM. The findings reveal that there is little alignment between IS and supply chain strategy even though technology is used widely in the company that is investigated. The lack of alignment has prevented the organisation from being DSCM capable. The study highlights the impacts of lack of alignment between IS and DSCM and helps practitioners understand the implications.

Keywords
Demand Supply Chain Management, Demand Chain management, Information Technology, Information System Alignment, Process Management

INTRODUCTION
Supply chain management (SCM) has undergone changing paradigms in recent years with demand supply chain management (DSCM) emerging as a popular approach to effectively managing demand and supply (Gunasekaran & Ngai 2004; Qrunfleh & Tarafdar 2012). DSCM was proposed in 2010 (Hilletofth 2011) and has become a new driving force in the logistics and supply chain discipline integrating internal supply capabilities with marketing behaviour. DSCM also requires alignment between hardware capabilities and software management configuration (Gattorna 2012).

IT/IS plays an essential role in changing the way a supply chain is managed (Gunasekaran & Ngai 2004; Zhang 2007). IS as one of the most crucial enablers for DSCM implementation, It transcends from the traditional role of supporting SCM to one that has the potential to formulate new business strategies (Al-Mudimigh, Zairi & Ahmed 2004; Walters 2008).

A review of the literature shows that to date there is limited research on SCM using the DSCM approach (Hilletofth & Hilimola 2008; Hoover Jr et al. 2002; Jacobs 2006). Despite the importance of IT/IS in SCM, there are not that many studies that try to understand the role of IT/IS in the management of processes and the establishment of configuration in DSCM (Jüttner, Christopher & Baker 2007; Rainbird 2004). Literature review also reveals that there is a lack of theoretical understanding of how IS can support DSCM from an information processing perspective or how IS alignment can affect demand chain strategies.

The paper attempts to fill this gap by proposing a theoretical framework that assists in understanding the IS/IT requirements for demand and supply chain alignment. It advocates the concept of dynamic matching of IS in DSCM and contends that IT systems should be carefully packaged in different combinations to power the different supply chain configurations instead of having IT systems infusion thrown at every facet of the business. Under the DSCM...
paradigm, strong leadership and management are essential to navigating the conflicts and complexities that will arise from trade-offs and compromises (Gattorna 2003). IS strategy needs to be clearly aligned with the organization’s business strategy and underpinned by an effective IS/IT architecture that facilitates internal and external collaboration.

The study adopts the qualitative methodology to investigate the critical IS/IT elements involved in DSCM using the pharmaceutical industry as a case study. As an exploratory research, close observation at the Consumer Retailing department of a large pharmaceutical company among the top 500 as listed in the Fortune magazine was carried out for one year.

LITERATURE REVIEW

DSCM is a concept or approach that has evolved from supply chain management (SCM) and demand chain management (DCM). The concept has been around for years in business. Its significance in the logistics and supply chain management (LSCM) industry, however, is relatively recent. The conventional SCM emerged in 1980s tends to optimize internal production efficiency with supply-focused process comprising inbound logistics, operations and outbound logistics (Oliver & Webber 1982; Priem & Swink 2012). DCM contrasts the SCM paradigm by relocating the focus to the downstream business processes (Esper et al. 2010). DCM contrasts the SCM paradigm by relocating the focus to the downstream market which value derives from (Wieland & Wallenburg 2011). In this regard, the whole value chain is into supply activities and demand marketing service. Christopher (2005, p. 5) contends against the limitations of the uni-dimensional, cost-focused supply chain as follows:

“Supply chain management should be termed demand chain management to reflect the fact that the chain should be driven by the market, not by suppliers. Equally the ‘chain’ should be replaced by ‘network’ since there will normally be multiple suppliers and, indeed, suppliers to suppliers as well as multiple customers and customers’ customers to be included in the total system.”

As the literature reveals, migration from DCM to DSCM can be broadly be divided into two phases (Table 1). The first phase regards the supply chain as market mediation and seeks supply answer on the ground of ‘what customers want’ instead of ‘why and how’(Schelmetic 2013). The second phase considers the demand chain as an entity in its own right that integrates the marketing role with supply chain processes or capabilities. It is a broader scope connecting marketing factors such as customer behaviour study, marketing planning, branding with actionable strategies and plans for the whole groups of firms in the network with supply chain management (Langabeer & Rose 2001). Under this notion, the emphasis of business gradually shifts from the supply-side to the overall-value adding and from inside-out to outside-in strategic processes (Hillettofth 2007; Walters 2006).

Table 1- Two developing stages of DCM

<table>
<thead>
<tr>
<th>Stage</th>
<th>Synopsis</th>
<th>Supporting Literature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase 1: Replacement of SCM (Ontology)</td>
<td>A more narrow definition of DCM based on distinction between the efficient physical supply and the market mediation roles, which defines the term as market mediation supply chains; Regarding demand as exogenous condition; Addressing the issues in the frame of SCM definition</td>
<td>(Christopher &amp; Payne 2002; Cooper, Lambert &amp; Pagh 1997; De Treville, Shapiro &amp; Hameri 2004; Fisher 1997; Goldmann, Nagel &amp; Preiss 1995; Lambert &amp; Cooper 2000; Srivastava, Shervani &amp; Fahey 1999; Vollmann &amp; Cordon 1998)</td>
</tr>
<tr>
<td>Phase II: Synergies between marketing and SCM (Epistemology)</td>
<td>Integrating demand and supply orientated processes; Viewing DCM as a macro level process which includes all activities that companies undertake in their quest to create and deliver needs-based customer value propositions; Differentiating products and delivery, sourcing processes to proactively satisfy different customer needs with distinctive supply chain solutions</td>
<td>(Baker 2004; Christopher, Peck &amp; Towlill 2006; Flint 2004; Hammer 2003; Jüttner, Christopher &amp; Baker 2007; Mentzer et al. 2001; Rainbird 2004; Slater 1997; Walters &amp; Rainbird 2004)</td>
</tr>
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</table>

The change in nomenclature from DCM to DSCM reflects the progressive fulfilment from limited perspectives to multi-disciplines and broader business scopes. DSCM builds on the essence of DCM highlighting the importance of marketing philosophy, expanding the notion into a higher level from an overarching management perspective (Jüttner, Christopher & Baker 2007; Rainbird 2004; Van Goor 2007).

Demand Supply Chain Management
Although the concept of integrating business management with supply management has been mentioned in the business world particularly in business administration, the orthodox DSCM paradigm in logistics and supply chain industry was originally proposed in 2010 by Hilletofth (2010). Hilletofth (2011, p. 187) defines DSCM as “an approach to gain a superior competitive advantage by balancing cost efficiency, responsive effectiveness, differentiation and innovativeness process across functional organizational and inter-organizational boundaries”. The study explores the overarching alignment of three main elements: marketing management, supply chain capabilities, and organizational leadership management (Hilletofth 2011). Nevertheless, it is confines to theory building and exploration. In subsequent studies, operational process management in DSCM has been emphasized to reinforce the broad philosophy since DSCM advocates incorporating organizational capabilities within the value proposition from more leadership management perspective (Lau 2012).

(Baghai, Coley & White 2000) suggest that organizational capabilities embedded in a company’s people, processes and institutional knowledge are basic value catalyst to enhance the fusion between supply and demand drivers. (Lau 2012) advocates DSCM as a new field of modern study on holistic demand supply chain collaboration not only from combination of marketing strength and supply chain capabilities but also changes in organizational environment. Gattorna (2010) also stresses the important role of human resources in the dynamic alignment framework by integrating marketing rules, internal supply chain strategies with internal culture and leadership style. The full-fledged implementation of DSCM in practice needs strong collaboration, IT support and a supportive company regime (Hilletofth 2012). A review of existing literature reveals that IS/IT management plays an important role in the DSCM process and configuration management (Table 2). IS/IT is the trigger for overall DSCM process revolution since it impels the collaboration among the stakeholders and internally de-functionalizes the organization configuration (Jüttner, Christopher & Baker 2007).

<table>
<thead>
<tr>
<th>Enablers</th>
<th>Studies</th>
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<tr>
<td>Supply chain strategic design based on marketing / demand research</td>
<td>(Esper et al. 2010; Hilletofth 2007; Jacobs 2006; Jüttner, Christopher &amp; Baker 2007; Walters &amp; Rainbird 2004)</td>
</tr>
<tr>
<td>The proper balance between demand creation and fulfilment and between revenue growth and cost reduction</td>
<td>(Ericsson 2011; Esper et al. 2010; Hilletofth 2011; Jacobs 2006; Jüttner, Christopher &amp; Baker 2007)</td>
</tr>
<tr>
<td>Information sharing / relationship management</td>
<td>(Hilletofth, Ericsson &amp; Christopher 2009; Jüttner, Christopher &amp; Baker 2007; Walters &amp; Rainbird 2004)</td>
</tr>
<tr>
<td>Integrated IT support</td>
<td>(Charlebois 2008; Frohlich &amp; Westbrook 2002; Williams, Maull &amp; Ellis 2002)</td>
</tr>
<tr>
<td>Trust and loyalty</td>
<td>(Al-Mudimigh, Zairi &amp; Ahmed 2004; Selen &amp; Soliman 2002; Walters 2008)</td>
</tr>
<tr>
<td>Commitment from senior leadership style fit (culture change / business strategy alignment / functional process and department fit)</td>
<td>(Esper et al. 2010; Hilletofth 2011; Jüttner, Christopher &amp; Baker 2007; Langabeer &amp; Rose 2001)</td>
</tr>
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</table>

**IS/IT Enabling DSCM**

The role of IS is gradually shifting from a clerical supporter to a strategic enabler along the value chain (Rushton 2000; Walton 1997). It innovates along many stages from disparate single function to integrating process applications (Closs, Goldsby & Clinton 1997). The IS evolution facilitates and lever the strategic transformation of organization from SCM, demand driven supply chain (DDSC) to demand network management. Many distinguished IT systems have been exploited in line with the supply chain evolution. Examples include electronic data interchange (EDI) for routine business information exchange (Gunasekaran & Ngai 2004; Themistocleous, Irani & Love 2004); Internet/online e-commerce for business communication (Armstrong & Hagel 2000); ERP or ISSP for strategic integration within the organizations (Gattorna 2003; Gunasekaran & Ngai 2004; Hicks 1997); CPFR for collaborative demand management (Kerr 2010)

Gunasekaran and Ngai (2004) present a holistic the literature review on IT in SCM from 1990s to date based on longitudinal criteria. The article classifies existing literatures into six main aspects which are strategic planning for IT in SCM; virtual enterprise and SCM; e-commerce and SCM; infrastructure for IT in SCM; knowledge and IT
management in SCM and implementation of IT in SCM. (Talluri 2000) categorizes IS in terms of SCM into three main levels which are strategic (network design), tactical (supply planning) and operational level (production scheduling). Gattorna (2003) integrates these ideas and decouples the system levels into top strategic planning; middleware process management and lower infrastructure layer (Figure 1).

**Figure 1: IT architecture layers for demand planning model (adapted from (Gattorna 2003))**

Although the use of IS/IT is a common practice in business today, there is significant overlapping in functionality as well as conflicting offerings that do not necessarily integrate into a logical function. No single technology can be a panacea to addressing all business needs. Instead, various technologies are pieced together as driver applications in a dynamic and diversified market driven environment, e.g., enterprise application integration (EAI) (Themistocleous, Irani & Love 2004). Under current demand-driven market, the nature of the IS has been gradually evolved from a static supporting tool for a certain function to one that helps realize the vision of the business and provide for strategic management. At the same time, the booming of the IS in the market and the shrinking of key business cycles reform the formulation of information systems strategy. As shown in Table 3, IT innovation undergoes transform from a simple technical-rational process for problem solving to innovation involving economic and political processes to the articulation of interests, building alliances and thriving for outcomes. As such, IS/IT has become a critical factor of success to support, promote and innovate the strategic paradigm of supply chain.

Table 3: IS/IT enablers from for SCM, DCM and DSCM

<table>
<thead>
<tr>
<th>Information Systems</th>
<th>Infrastructure layer (Data bases/legacy systems)</th>
<th>Strategic planning applications from intra supply chain (ERP)</th>
<th>E-commerce, Inter-system (Customer layer/ Demand Planning Tool)</th>
<th>Integration of systems / Collaboration e.g. EAI</th>
<th>Alignment of policies and business strategies</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logistics Functionalities</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>(Gunasekaran &amp; Ngai 2004; Stenger 1986)</td>
</tr>
<tr>
<td>SCM</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>Gunasekaran &amp; Ngai 2004; Themistocleous, Irani &amp; Love 2004</td>
</tr>
<tr>
<td>DCM</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>Gattorna 2012; Henderson &amp; Venkatraman 1993; Qrunfleh &amp; Tarafdar 2012</td>
</tr>
<tr>
<td>DSCM</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Browne &amp; Zhang 1999; Gattorna 2012; Rogerson &amp; Fidler 1994</td>
</tr>
</tbody>
</table>

Despite the vast literature on IT & SCM integration, there are limited studies that have identified IS/IT as a critical enabler for the demand chain integration. For example, EAI/EI are designed for addressing the issue of integrating the portfolio of SC systems components within and between organizations. It works as a ‘glue’ portal to link all pieces of applications, such as ERP and SCP/DP, together (Kalakota & Robinson 2001; Linthicum 2001). The new information sharing and communication technology (ICT) of cloud computing service sets up a common platform for information sharing with an market-oriented focus (Armbrust et al. 2010; Buyya et al. 2009). There are also few studies touching on overall alignment between the SC and IS strategies (Broadbent & Weill 1993; Henderson & Venkatraman 1993).

Existing research on IT & SCM emphasizes strongly on SC strategy. However, specific process on human and cultural impacts on IT is often neglected. Themistocleous, Irani and Love (2004) propose a framework for evaluating the portfolio of integration technologies that are used to unify inter-organization and intra-organization IS via EAI. However, the visionary business goal has not been integrated or considered as a precondition. (Rogerson & Fidler 1994) present a framework for classifying strategic information system planning methodologies on two dimensions: structural complexity and application complexity. However, the issue of cultural complexity in the DSCM has been left out. Henderson and Venkatraman (1993) propose a comprehensive framework for IS strategic
alignment incorporating four domains of strategic choice: business strategy, IT strategy, organizational infrastructure and process, and IT infrastructure and processes. Nevertheless, the strategic human aspects have again been ignored.

Given that DSCM is relatively new (Hilletofth 2012; Hilletofth, Ericsson & Lumsden 2010), there is a research gap between understanding how IT/IS and how contributes to the success of DSCM. There is a lack of a theoretical understanding of how particular IS/IT can support information-processing requirements associated with DSCM practices. As such, this paper attempts to fill the gap by focusing on IS alignment in DSCM. There is a strong need to find the effective IS factors embedded in demand and supply network that articulate company vision, outline the needs for applications and technologies, and detail the path for transforming the vision into reality. Under the DSCM paradigm, strong leadership and management are essential to navigating the conflicts and complexities that will inevitably arise in the DSCM process (Gattorna 2009; Kerr 2010). The IS strategy for overall demand and supply chain integration needs to be aligned with the organization’s business goals and underpinned by an effective IT architecture that facilitates internal and external collaboration. Therefore, this research aims to understand the organisational use of IT for effective DSCM. The research question is:

*How could the IS function be integrated in different levels in the organization for DSCM achievement?*

**IS-in-DSCM ALIGNMENT FRAMEWORK**

This research proposes a theoretical IS-in-DSCM framework (Figure 2) underpinned by alignment theory to holistically explore the role and use of IT/IS for DSCM. The alignment theory advocates that economic performance is directly related to the ability of management to create a *strategic fit* between the position of an organization in the product-market arena and the design of an appropriate administrative structure to support the execution (Chorn 1991; Henderson & Venkatraman 1993). It proposes that there are four types of ‘logics’ sectors in the market, namely production, administration, development and integration. Each of these four logic sectors has its coordinating strategic solution in terms of four elements, namely competitive situation, strategy, organization culture and leadership style (Chorn 1991).

The alignment theory contends that alignment of these logic sectors and elements is critical to effective organisational management. The proposed IS-in-DSCM framework in this study adapts and extends the alignment theory by including three additional elements identified from literature review. They include i) supply chain strategies, ii) IS applications, and iii) organisational configuration. The proposed framework reflects the concept of DSCM aligning marketing factors with supply chain capacity and overall organization subculture to achieve internal and external consistency. In the framework, IT systems are initiated to align with corresponding supply chain strategies. Instead of taking a scattered approach, IS systems are carefully packaged in various combinations to support different supply chain configurations.

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**METHODOLOGY**

This study adopts in-depth case study methodology to investigate a large pharmaceutical organization which ranks among the top 500 companies in the Fortune magazine. Case study method is appropriately for preliminary exploration of an issue which is not yet clearly defined or fully understood (Williamson & Bow 2002; Yin 2008).
The methodology has been widely used in DSCM research (see for example Hilletofth 2011, 2012; Hilletofth, Ericsson & Christopher 2009; Hilletofth, Ericsson & Lumsden 2010; Hilletofth & Hilimola 2008; Lau 2012). In this research, the organization is used as a pilot for a single case study. Single case study is potentially designed as the representative or typical case that aims to capture the circumstances and conditions of an everyday or commonplace situation (Yin 2003, p. 94). The case chosen in this study represents a certain level of project including many different setting requirements. The organization has well formulated IT systems and mature supply chain knowledge. It will help refine data collocation with respect to both the content of the data and the procedures to be followed (Yin 2003).

The case company is an American-owned multinational corporation (henceforth referred to as Company Alpha) that started its operations in China in 1980. In the last 30 years, the regional Chinese office, headquartered in Beijing, became the largest bio-pharmaceutical company in China. It has established three manufacturing facilities in Suzhou, Dalian and Wuxi provinces. It owns two retail and distribution centres in Shanghai and Wuxi provinces. The Chinese regional office employs more than 10,000 employees with an annual turnover of 1 billion dollars. The products made by the Chinese regional office are distributed to more than 200 cities worldwide.

This study used participant observation and interviews to collect the required information. One of the researchers spent about one year in the organization as a complete participant to collect first-hand data. Semi-structured interviews with the related managers and IT professionals were carried out to discuss issues of organizational culture, SC structure and IS systems. All interviews were recorded and transcribed. The interviews were recorded and transcribed. Content analysis in the form of thematic coding (Miles & Huberman 1994) was performed on the transcriptions of the interviews.

DISCUSSIONS AND FINDINGS
Company Alpha has two divisions in China: i) the bio-pharmaceutical (WBB) and ii) diversified business (PDB). WBB contains six units that are responsible for different medical research and products. The six units are high blood pressure, high cholesterol, central nervous systems, anti-infective, commercial and diversified and, vaccines and oncology.

Company Alpha’s supply chain involves both domestic and international. Products that require high level of technology to manufacture are mostly imported from overseas. The local manufacturing plants are responsible for less complex medication such as tablets for common illness e.g., flu, cold, Viagra for urology, Lipitor for cardiovascular scope, etc. The manufacturing plants are located near to the ports so that products can be shipped and distributed quickly. Partnering distributors are responsible for dispatching the products from the plants to the market.

Figure 3 shows the specific local procurement process. To reduce the risk of supply chain mismanagement, most partnering distributors are state-owned companies.

Understanding IT/IS Use in Company Alpha’s Supply Chain
The domestic supply chains mainly use EDI for data transmission and management with several ERP applications, such as Sun (now owned by Oracle Inc.) ordering system. The ERP system has continually been adapted and...
extended in line with changing market requirements. The system functions cover a multitude of order picking methods: i) whole and part pallets for bulk buyers; ii) goods-to-person order picking for purchase quantities in whole cartons; iii) pick-by-light system for order picking of medium quantities (tray conveyor technology with superimposed empty cartons; iv) breakdown of the system into three zones for products with various mobility order picking with WLAN-capable mobile data terminals from run through channels, shelving and pallets and v) special FMCG order picking for pharmacy direct delivery.

At downstream, an E-ERP Sherlock sales-automation system is adopted to help targeting the marketing sales, pattern analysis on the consumers or promotional programs settings. The marketing system unifies different sales data into one single platform. Applications include database, e-mail, territory management, travel and expense, sales activity, and call reporting. Besides, a “shared platform” application requires the information exchange between salesman and managers about the managed-care task. By pooling and sharing the information, the system could manage and reflect the information responsively, that promote the business relationship with consumers.

The import-based supply chain (Figure 4) deals with high standard products import from international manufactures, such as Xalacom and Zavedos. International freight forwarder is responsible for international air freight of the parcels cooperating with the local importers for custom clearances and local distribution to the customers. The case company acts as a common platform and the supply chain facilitator for overall process management. Due to the large amount of data and documentation transmission from export and import, EDI is set up for transparent information transmission. EPR systems such as Ariba application for purchasing management and Manugistics system for continuous replenishment from demand side are integrated with EDI system.

**Figure 4: Import process for Company Alpha**

**Implications of IT/IS for DSCM**

Company Alpha’s IT systems and applications are considered mature by its users and executives. However, there is a lack of synergy and integration between systems that results in non-optimal performance for its supply chain management. Demand management is supported primarily from a functional perspective rather than a holistic approach. ERP applications are used heavily as a supportive role for forecasting and production schedules by the departments. There is little evidence to show that DSCM practices are being encouraged by the use of matured IT/IS systems in Company Alpha. Execution of production and planning is based on functional management which assigns the functions equally under each department (Table 4).

**Table 4: Current IS/IT applications Used by Company Alpha**

Table 4 summarizes the current IS and supporting applications executed by the case company. This exploratory research has identified the key IT elements used by Company Alpha to manage its domestic and international supply chain. However, despite the capabilities provided by Company’s Alpha’s IT/IS platform, there is little evidence to support the practice of DSCM. The use of IT/IS in Company Alpha has been restricted to primarily facilitating communications between partners and suppliers to improve the accuracy and speed of transactions. This alone does not provide better demand supply chain management.

This case study has found that IT capabilities alone do not encourage the use of DSCM to manage a company’s supply chain. The executives in Company Alpha have highlighted the need for better optimisation of its supply chain through effective demand management. The researchers noted that Company’s Alpha has the capabilities to practice DSCM via its existing technological platform that includes RFID, Sales Automation Systems and ERP applications. However, it is found that alignment between IS, supply chain strategies and organizational configuration for proper DSCM has not been yet been in place.

This research highlights that the absence of an appropriate organisation configuration i.e., company culture, top management support and policies, leads to a misalignment of use of IT/IS for effective supply chain management in the context of DSCM. Given that Company Alpha is one of the top leaders in the bio-pharmaceutical industry, this exploratory study provides an insight to the understanding of the role of IT/IS for DSCM. The findings of the research suggest that without the appropriate organisational configuration, there is a limitation in IT/IS capabilities to enable DSCM. The year-long participant observation and interviews of managers and IT professionals reveal that demand chain integration has not been achieved due to various limitations, such as the lack of awareness of supply chain integration, IT/IS capabilities to support SCM and the advanced supply chain capabilities.

CONCLUSIONS AND FURTHER RESEARCH
Technology is an important enabler of integration. However, technology alone does not lead to collaboration. Organizations need to determine the business process that drives the sharing of information and defines the key areas of its business where collaboration can be achieved. It needs to identify the approach that it will use and the companies that it will deal with, for each specific area and its overall strategies. The successful implementation of IS is obtained through the capability of an organization to exploit IT functionality on a continuous basis. This requires a fundamental change in managerial thinking about the role of IT in organizational transformation, as well as an understanding of the critical components of IT strategy and its role in supporting and shaping business strategy decisions.

The study using an in-depth exploratory case study to provide insights into the use of IT/IS as an enabler for SCM in the context of DSCM. The finding of this study reveals that albeit heavy investment in IT to support upstream, midstream and downstream activities as done by the case company, the lack of proper alignment between marketing, supply chain and IT strategies would not facilitate DSCM. To achieve this, changes in organization culture and provision of strong management support is critical. This study has contributed to knowledge by identifying the need for appropriate alignment between supply chain strategy, IT/IS and organisational configuration for DSCM realization and pinpointing the direction for further research.

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