The Role of Process Integration for Supply Chain Agility: An Information Processing Perspective

Henry Xiao
UNSW Australia Business School
University of New South Wales
Sydney, New South Wales
Email: z3373128@student.unsw.edu.au

Felix Ter Chian Tan
UNSW Australia Business School
University of New South Wales
Sydney, New South Wales
Email: f.tan@unsw.edu.au

Rajesh Vasa
Faculty of Science, Engineering and Technology
Swinburne University of Technology
Melbourne, Victoria
Email: rvasa@swin.edu.au

Abstract

As businesses strive to respond to customer demand at an acceptable cost in the face of market turbulence and volatility, interest in supply chain agility as the ability to address such market uncertainties has grown. As a research in progress paper, we will examine the ways in which supply chain agility is enabled through IT-enabled information processing capabilities and advance prior work in terms of sensemaking and sensegiving as the capabilities. Our case study on Visy, a paper packaging and recycling company, will investigate the ways in which these capabilities enable supply chain agility via process integration in the context of the order fulfilment process. Our complete research paper will reveal the findings in a conceptual process model with the discovered constituents of supply chain process integration as the underlying mechanism(s) between the information processing capabilities and supply chain agility.

Keywords

Supply Chain Agility, Information Processing, Sensemaking, Sensegiving, Visy Pty Ltd.

INTRODUCTION

Market uncertainty as a perennial challenge can include advancements in technology, hyper-competition, rising customer demands, regulatory changes, etc. (Overby et al. 2006). Such market turbulence requires businesses to make more improvised and informal decisions in the face of changes in the market and customer demand (Huang et al. 2014). This ability to sense the relevant changes in the market and respond to customer demand at an acceptable cost to the business is also defined to be supply chain agility (White et al 2005; Overby et al. 2006). Supply chain agility has been advocated by Lin et al. (2006) to be a necessity for companies to succeed in becoming international leaders of the 21st Century.

This exploratory study will investigate the ways in which IT-enabled information processing capabilities enable supply chain agility. Although information technology (IT) literature have identified and validated the antecedents on the effectiveness of supply chain agility, the underlying mechanisms that enable agility in the supply chain remains unanswered in literature. Such antecedents include information exchange (Ramayah and Omar 2010), virtual integration (Wang et al. 2006), integration (Nazir and Pinsonneault 2012), and collaborative relationships, flexibility, internal integration and IT in the supply chain (Ngai et al. 2011). Existing studies focus on validating the identified antecedents, where IS (Sambamurthy et al. 2003; White et al. 2005; Overby et al. 2006) is considered to be a general enabler of agility. Supply chain agility is decomposed into two capabilities, sensing and responding capabilities (Ngai et al. 2011; DeGroote and Marx 2013), both of which are enhanced by information processing capabilities (Huang et al. 2014). The complex nature of information processing calls for more research that better accounts for the underlying mechanisms of information processing capabilities that enable supply chain agility.

This exploratory study is beneficial if addressed, as there are three reasons why. Firstly, less agile supply chains deteriorate performance; however 27% of 117 of the supply chain executives interviewed equalize agility with the same importance as performance (Cecere 2012). "Supply chains are substantially less agile than [they were] five years ago" and to make things worse, they are getting less resilient and more brittle (Cecere 2012). This is due to the unconscious trade-off of supply chain agility with a stronger supply chain by e-bidding, e-procurement, lean process improvement and tight supply chain integration (Cecere 2012). Therefore studying supply chain agility raises the awareness of its growing importance to the industry. Secondly, there will be practical contributions from clarifying the constituents of the underlying mechanisms that enable supply chain agility. This is going to induce discourse and discussion as to how these constituent roles further interact within the supply chain from the theoretical lens of the information processing theory. Our research will help firms devise strategies in achieving agility in the supply chain at a more practical level. Thirdly, the findings of our research can Visy develop cost-saving initiatives for its supply chain. Visy will be the company selected for our research case study, a paper packaging and recycling company. Our research will not only delve deeper into the understanding of how Visy's supply chain is agile but also explore how Visy continues to adapt and evolve with changes on the demand-side. This will be made possible by studying an aspect of Visy's supply chain that is driving new orders with the support of a network of supply chain partners. The risk of not studying supply chain agility does not increase the awareness of its importance, which according to Lee (2004) is ignored by most companies and experts. Lee's (2004) observation informs us that companies are so persistent to attain greater speed by investing in state-of-the-art technologies to deliver goods and services to customers in a cost-effective way that they are unable to respond to supply and demand volatility. The percentage of products marked down in America increased from under 10% in 1980 to over 30% in 2000, where similarly, customer satisfaction on product availability also declined (Lee 2004). This study is therefore important as this research seeks to understand the ways in which a supply chain can achieve agility.

In this paper, we introduce our research design to address the above research gap. The study will examine the ways in which supply chain agility is enabled by information processing capabilities with an in-depth focus on supply chain process integration. Such integration is also critical for businesses today to achieve supply chain agility (Palma-Mendoza et al. 2014). In the context of supply chain management, this involves network and coordination. Networks as a characteristic of integration is important as organizations behave in unity in the facilitation of coordination to enable agility in the supply chain of the firm (Nazir and Pinsonneault 2012). We will examine supply chain agility under the theoretical lens of information processing theory and extend the work of Huang et al. (2014) by exploring sensemaking and sensegiving as the information processing capabilities in relation to supply chain agility. The expected theoretical findings will be a model to pronounce the mechanisms of information processing capabilities enabling supply chain agility.

THEORETICAL BACKGROUND

Our research on the ways in which supply chain agility is enabled, is based on the analysis and investigation of the 'black box' between IT and agility. Studies often use findings from existing literature and insights from the case study to identify the relevant themes for future research. Existing literature focus on validating the identified antecedents of supply chain agility, where the general verdict considers IT as the enabler. However the contradiction of this relationship by virtue of the factors such as the rigidity of technology artefacts and information systems (Wensley and Stijn 2006;) undermines this enabling relationship. The contradictory findings contrast studies that argue that IT enables agility such as by delivering digital options (Sambamurthy et al. 2003), easing communication, refining digital options (Davenport et al. 2004) and providing electronic integration (Nazir and Pinsonneault 2012). This challenges us to clarify the underlying mechanisms by which information processing capabilities enable supply chain agility. Seminal articles emphasize what constitutes an agile supply chain, however the ways in which this is achieved needs to be explored more when it comes to building the capabilities, with agility in mind. The conundrum lies in not what constituents enable this phenomenon rather it is the ways in which these constituents can enable this phenomenon that needs to be explored more in terms of a conceptual process and the triggers that initiate this process. We witness such constituents to be virtual, process integration, network-based and market sensitive (Christopher 2000), and marketing/customer sensitivity, information integration, process integration and collaborative relationships (Lin et al. 2006). Investigating information processing capabilities as the triggers that enable supply chain agility is the crux of our study, as it informs the value of information processing theory in the supply chain from a process integration perspective. As we discuss these key concepts, we will reach a conceptual framework after a thorough discussion in the literature review.

Information Processing Theory

Galbraith's (1973) information processing theory offers a plausible means to investigate the underlying mechanisms to enable supply chain agility (Mani et al. 2010; Huang et al. 2014). However, some studies leverage the findings of existing studies and lack a theoretical lens when examining the ways in which supply chain agility is enabled from the information processing capabilities. This theory "states that organizations are structured around information and information flows in an effort to reduce uncertainty" (Fairbank et al. 2006). This theory identifies 3 concepts: information processing capability, information processing needs and the fit between capability and needs to optimize performance (Premkumar et al. 2005). The information processing needs are forms of uncertainty and information processing capabilities are levels of IT support to reduce this uncertainty. The third concept means the impact of the interaction between the two on performance (Premkumar et al. 2005).

Information processing involves information dissemination, generation, interpretation and memory (Wang et al. 2008). Dissemination is the diffusion and sharing of information in the organization, which is similar to the strategic process of sensegiving, which is to inform the strategic change information to all stakeholders (Rouleau 2005). Generation is acquiring new market information. Interpretation is the process by which the meaning of the information is understood, which mirrors sensemaking as a capability of translating information into knowledge (Malhotra 2001). Memory is the process of storing and codifying knowledge. As generation and memory are inherent parts of information processing, we therefore perceive interpretation and dissemination as the most relevant dimensions in the context of sensemaking and sensegiving. The social and personal constructs of sensemaking and the strategic process of initiation in sensegiving enhance information processing capabilities.

Sensemaking and Sensegiving in the Supply Chain

Sensemaking is a human process or capability to translate information into knowledge, leading to action and performance (Malhotra 2001). Malhotra identifies both information processing and sensemaking as 'meaning making processes' (2001, pg. 8). In particular, sensemaking resembles the interpretation aspect of information processing capability as shown in Figure 1. On the other hand, sensegiving is also the interpretive approach of humans to articulate the knowledge derived from sensemaking to others (Gioia and Chittipeddi 1991; Hill and Levenhagen 1995). Rouleau (2005) sees sensegiving as an initiation of a strategic process to inform all stakeholders about the change effort in the form of information or interpretation. This resembles the dissemination dimension of information processing capabilities as shown in Figure 1.

Information	Knowledge	Action	Performance
Interpretation and Sensemaking		Sensegiving and Dissemination	

Figure 1: Sensemaking and sensegiving as information processing capabilities

Sensemaking and sensegiving were emergent concepts in literature that are studied in light of instigating a strategic change process in the organization (Gioia and Chittipeddi 1991; Rouleau 2005). Strategic change is an attempt to sense by cognition and respond by action to environmental opportunities and threats (Gioia and Chittipeddi 1991). Sensemaking is discourse, whereas sensegiving is action, both concepts are reciprocal and sequential to one another. When it comes to sensemaking, the information processing systems re-assess the experience, and treat the aims as the hypotheses, intuition as the truth and organizational memory as its nemesis on a continuous basis (Malhotra 2001). On the other hand, when it comes to sensegiving, the information processing systems provide a foundation for understanding other organizational facets such as personal satisfaction and power relationships (Malone 1990). As the information-processing capabilities address information processing needs or uncertainties via the interpretation of sensemaking and the dissemination of sensegiving, we can therefore categorize sensemaking and sensegiving as information processing capabilities,

Information Processing Capabilities for the Supply Chain

According to the information processing theory, uncertainty is reduced when organizations are able to cope with the increased information needs (Premkumar et al 2005). Studies have established that the information-processing capabilities are developed by organizations to facilitate the information required to deal with uncertainty (Galbraith 1973; Mani et al. 2010; Huang et al. 2014), in the context of supply chain agility, these uncertainties stem from unexpected market changes. These changes indicate the importance of information-processing capabilities to the supply chain as illustrated in project tasks (Grover and Saeed 2007), external environment (Thong 1999; Carlson and Davis 1998; Grover and Saeed 2007), relationship (Grover and Saeed 2007), and subunit interdependences (Volkoff et al. 2005). We therefore consider the capabilities of sensemaking and sensegiving in the context of supply chain agility to address the unexpected market changes.

Supply Chain Agility

Supply chain agility is defined as the sensing and responding capabilities within the supply chain to address market changes and reduce uncertainty (Ngai et al. 2011; DeGroote and Marx's 2013). These capabilities and the ability of an organization to synthesize its resources to work together with supply chain partners form the constructs of Mavengere's (2013) strategic agility model. These capabilities are relevant to the integration of supply chain processes, as the process-level is where value is created and performance improves (Raschke 2010).

Literature has identified the antecedents and constituents of an agile supply chain. Studies have identified the antecedents that enable supply chain agility as the following but not limited to: collaboration (Wang et al. 2006; Ngai et al. 2011), flexibility (Wang et al. 2006; Ngai et al. 2011), integration (Wang et al. 2006; Ngai et al. 2011; Nazir and Pinsonneault 2012) and information technology (IT) (White et al. 2005; Overby et al. 2006; Ngai et al. 2011). These factors denote a shift in focus from an intra-organizational emphasis to the inter-organizational collaborative role in supply chain agility. Studies have also identified the constituents of an agile supply chain to be the following but also not limited to virtual and network-based (Christopher 2000), information integration, process integration and collaborative relationships (Lin et al. 2006) and market sensitive (Christopher 2000; Lin et al. 2006). However the causality relationship of the ways in which these antecedents and constituents enable supply chain agility needs to be explored more instead of the interrelationships between the derived variables of an agile supply chain as witnessed in the model of Agarwal et al. (2007). According to Premkumar et al. (2005), testing the information processing theory in a new context is a great opportunity due to the dramatic developments in the information processing capabilities of inter-organizational interactions such as integration.

Supply Chain Process Integration

Information processing theory suggests that data and process integration is most suitable when there is high information uncertainty, as the costs of integration may exceed the benefits if those conditions are absent (Volkoff et al. 2005). The multiple contexts of which this theory is used as a theoretical lens in, e.g. creativity (Müller-Wienbergen et al. 2011), knowledge management (Wang et al. 2008), online privacy (Hann et al. 2007), can be leveraged to study the ways in which information processing capabilities enable supply chain agility via supply chain process integration. Studies have confirmed the importance of information processing integration (Lin et al. 2006; Wang et al. 2006; Nazir and Pinsonneault 2012) and networks (Huang et al. 2014) in information processing capability. Therefore in the context of enabling and improving supply chain agility, the focus is on the ways in which the information processing capabilities of sensemaking and sensegiving can form the integrated networks of trading partners as well as coordinating and adjusting these linkages as per the changes in market conditions (White et al. 2005). Figure 2 shows this in a conceptual framework, where we will elaborate each component within the supply chain process integration in the sections below.
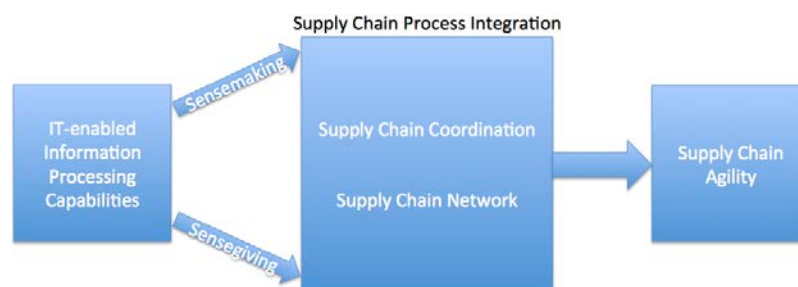

Figure 2: Conceptual research framework

The integration of supply chain processes is the extent to which the financial, information and physical flows are integrated in a focal firm with its supply chain partners (Rai et al. 2006). In order fulfilment, such processes are linked to customer satisfaction in the supply chain or the on-demand side of the supply chain. Liang and Tanniru (2007) states that satisfying these demands in the form of goods and/or services, requires intra and inter-organizational interactions that forces these organizations to develop agility in their technical infrastructure and process. Coordination and network are characteristics of integration in the supply chain. Internal integration facilitates coordination, which enables sensing and responding capabilities of firm agility (Nazir and Pinsonneault 2012). The result of this internal integration allowed organizations to behave as 'unified wholes', which are 'networks' in the supply chain in a loose sense (Nazir and Pinsonneault 2012).

Supply Chain Coordination

Supply chain coordination is about integrating the information-based processes of downstream and upstream operations (Dong et al. 2009). The integration of information processes are important in this study in terms of how the information processing capabilities enable supply chain agility through the coordination of such processes. There are two types of coordination, distributed and centralized, the former is at the firm level and the latter is at the network level (Shaw 2007). The dual control perspective sees centralized coordination or a controlled system as providing internal flexibility and the distributed coordination or an autonomous system as providing external flexibility (Wang et al. 2006). A controlled system ensures that the entire supply chain system is less disrupted by changes in the local environment (Wang et al. 2006). On the other hand, the supply chain evolves in the autonomous system since it absorbs the disturbances in the environment to create new orders and have the ability to impact the environment (Wang et al. 2006). We are interested in network level coordination as there is an emphasis of supply chain networks, and in this case the centralized coordination or controlled system is of interest as there is one firm that coordinates the functions of the network.

Supply Chain Network

A supply chain network is the media through which stakeholders of the supply chain manage activities (Holmqvist and Pessi 2006). The growing recognition of supply chains as having a sustainable advantage over individual entities has promoted the idea of supply chain network as one of the attributes of an agile supply chain (Christopher 2000). Most notably, this recognition has led to the so-called 'era of network competition', where businesses better at coordinating relationships with their network partners can achieve a greater responding capability from leveraging their partner's core competencies and their close customer relationships (Christopher 2000; Holmqvist and Pessi 2006). On the other hand, the degree of sensing capability involved in supply chain networks is implied in literature, we would therefore like to explore both capabilities of agility in supply chain networks with agility in mind. Ultimately, network competition reflects an agile supply chain from leveraging close customer relationships, which corresponds to the area of order fulfilment in terms of direct customer interactions. Our interests in the supply chain network therefore aligns with our conceptual process model, where we explore the ways in which this is part of the underlying mechanisms between information processing capabilities and supply chain agility.

In summary, this study investigates process integration in the supply chain as the underlying mechanisms of IT-enabled information processing capabilities that enable supply chain agility. This 'black box' includes supply chain coordination and supply chain network, and sensemaking and sensegiving are the capabilities of information processing. These capabilities of information processing are unexplored in the context of supply chain process integration. Sensemaking is interpreting the upstream and sensegiving is disseminating the downstream information processes (Wang et al. 2008). On the other hand, coordination is the integration of information-based processes of downstream and upstream operations (Dong et al. 2009) that create a setup typical of distribution supply chains of a logistics network (Shaw 2007; Bardhan et al. 2010). These capabilities of information processing offer a theoretic lens on the right amount of information required to achieve agility in order fulfilment by managing the information processing needs of the orders.

RESEARCH METHODOLOGY

Given that this research has an exploratory focus on the ways in which a phenomenon is enabled by an antecedent, an interpretive case study approach is appropriate. Interpretive research has emerged to become an accepted mainstream research practice in the IS literature (Klein and Myers 1999; Walsham 1995). The interpretive approach aims to deepen the understanding of the phenomenon in order to inform another setting than generalize from a setting to a population (Klein and Myers 1999). This is embedded in the constructivist epistemology, which summons for a plethora of in-depth insights into the socio-technical situations and processes of an agile supply chain.

The interpretive approach helps to develop a comprehensive insight into the 'black box', which is focused between the phenomenon, the supply chain agility and the antecedent as the information processing capabilities. This 'black box' will be confirmed in a single-case study and not a multi-case study, because the former is more efficient in terms of demonstrating relationships, more flexible in the use of variations and also more detailed in the assessment of individual change patterns (Nock et al. 2008). These strengths reinforce the fact that a single-case study is more holistic and embedded in its totality of studying a case, which is known as a longitudinal case (Blatter and Haverland 2012). Most of the limitations in single-case studies are a lack of generalization from the obtained effects, as the interventions effective for an individual may not be to other individuals when readministered (Scholz and Tietje 2002; Nock et al. 2008). However, firstly, with two caveats in mind, multi-case studies are also unable to prevent such issues from happening. Albeit multi-case studies obtain effects from

different settings, conditions and populations to be evaluated for generalization, the use of homogenous samples may also suffer from a lack of generalization (Nock et al. 2008). Secondly, single-case studies can be modified to use heterogeneous and multiple individuals across and within the case study itself to demonstrate generalization (Nock et al. 2008).

The single-case study data will be collected from face-to-face semi-structured interviews and analysed for the research findings as illustrated in Figure 3. Face-to-face interviews allow us to capture the interpretations of the participants in an effective way (Walsham 1995), illuminate important factors in detail (Oppenheim 1992; Walsham 1995) and follow up on questions for clarification (Oppenheim 1992).

Semi-structured interviews are more appropriate than structured interviews because the nature of the respondents, managers who are supply chain experts, prefer open questions to vocalise their perspectives (Walsham 1995). Semi-structured interviews are also appropriate as it allows interviewers to follow-up ideas and issues (Walsham 1995). The understanding of data collected from the semi-structured interviews for analysis will be enhanced with secondary data sources on the company in the case study. Secondary data sources help interviewers to understand the data from documents and archival records accessible via online public domains (Neuman 2014). The secondary data source will therefore help researchers code the primary data source in conceptualizing the process diagram. Open, axial and selective coding will condense the data into codes, link the codes and identify which codes to be selected to support the concepts developed in a process diagram (Neuman 2014). The data analysis will validate the primary data source with a questionnaire to gain helpful insights into the case study (Scholz and Tietje 2002).
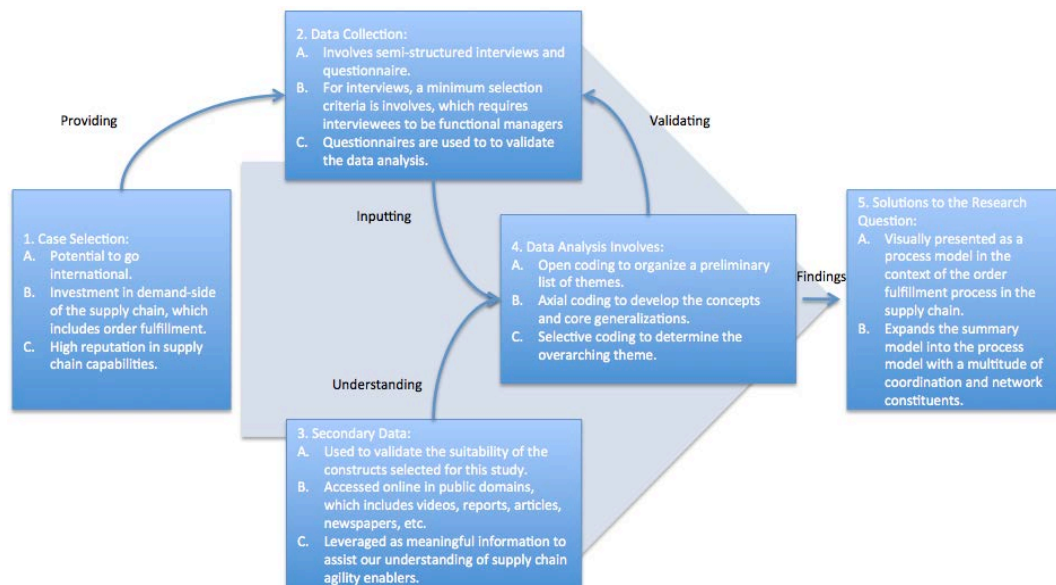

Figure 3: Research design

Step 1, Case Selection: Visy, an international paper packaging and recycling company, is selected for the case study due to three reasons, according to the official Visy website (2014). Firstly, Visy has national and international distribution facilities, which means that the case study has the potential to go international. Secondly, Visy's world-class supply chain technologies and investment in the demand-side of the supply chain involves order fulfilment, which is in our interest to study. We are studying a system in the supply chain that has an existing agile focus, where its information processing capability is to introspect demand for add-ons on top of an existing product line (consumables) and then model the various demand possibilities to drive new orders with the existing data in order to project demand. Part of the supply chain is to help drive the new orders is by the integration of historical data from past orders and mobile devices, where various supply chain partners in a network can estimate these possibilities with this data and apply this to the new orders. As a result, our research may improve the ways in which the demand for consumables are introspected and projected, as we explore the ways in which this supply chain adapts and evolves with the changes in demand. Thirdly, Visy has a high reputation in the supply chain capabilities of logistics services and networks, both of which are part of the areas to be explored in the 'black box' of our proposed conceptual research framework.

Step 2, Data Collection: Our initial contact from Visy will provide a number of potential candidates to be interviewed, where the interviews will be transcribed for analysis and subsequent interviewees is expected to be provided by means of respondent referrals. We will proceed to carry out initial questions on the IT-enabled capabilities for sensemaking and sensegiving in order to lay the ground for the interviewees to raise issues and ideas. These issues and ideas will shape the subsequent inquires in regards to supply chain coordination and

networks. The answers elicited will be adapted to the interview questions in probing further details in the emergent problems of the agility in the order fulfilment process. This loose interview question guideline may perhaps uncover the ways in which the sensing and responding capabilities are enabled. The minimum selection criteria for the interviewees are people who are the functional managers of logistics, who can access and have experience with the end-to-end process of order fulfilment (from the order preparation stage to customer delivery). This is because these people are able to inform us on the impact of the order and forecast information in this process to explore the underlying mechanisms of the enabler of supply chain agility.

Steps 3 Secondary Data: The purpose of using secondary data is to validate the suitability of the constructs selected for this study. Secondary data sources may include videos, reports, articles, newspapers, etc.

Steps 4, Data Analysis: The data analysis will use open coding, axial coding and selective coding on the interview transcripts. The interview transcripts will be open coded in Nvivo and memos will be written down as analytic notes to reflect and link raw evidence to theoretical and abstract thinking.

Step 5, Solutions to the Research Question: Ultimately, we expect that the major concepts developed from the selective coding on the order fulfilment process to pronounce the mechanisms enabling agility. As a result, our proposed research framework will be expanded into the conceptual process model with a multitude of coordination and network constituents.

CONTRIBUTIONS OF RESEARCH

The significance of our research outcome is to contribute to our understanding of enabling supply chain agility via process integration as the underlying mechanisms in an academic and practical way. Our findings may anticipate such an integration to fulfil orders in a more reflective, introspective and projective way. This will perhaps create a more versatile supply chain that is able to sensemake the various possibilities of demand. So that the supply chain can adapt to the changes by sensegiving and even projecting future demand as agility evolves. The contribution of this research will take in the form of a process model, as this is an effective way to present an idea. We show this in Figure 4, where we for instance illustrate constituents A and B identified as part of supply chain coordination and constituents C, D and E determined as part of supply chain network. Sensemaking and sensegiving will be linked to these constituents and the new connections will also be established from these constituents in terms of enabling supply chain agility. This is in the context of the order fulfilment processes with the pre-order and order processing stages.
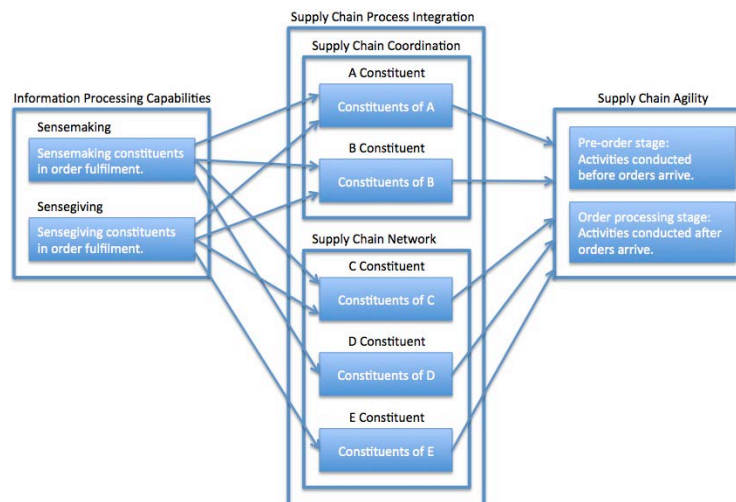

Figure 4: Our expected conceptual process model

The implication of Figure 4 will cover three areas. Firstly, we hope that the model will set the foundation for the underlying mechanism between the information processing capabilities and supply chain agility. The clarification of these mechanisms would hope to inspire future research to also explore past the identification of antecedents of supply chain agility, which is the most notable feature of existing literature. As a result, our research may extend the literature in understanding IS as a primary enabler of this agility under the focus of sensemaking and sensegiving. This may not only reveal specific ways in which this is achieved but also improve our understanding of how information-processing capabilities work. In addition, different to prior studies in supply chain agility, secondary data is utilized to confirm the process model. This should minimize the subjective bias, which maybe acquired by researchers in the course of data collection (Neuman 2014). Secondly, this research will perhaps allow the underlying mechanisms to be utilized by future studies to be confirmed by quantitative measures or examined

from the perspective of other contexts such as in organizational agility. In particular, our case study on Visy may lead to a confirmatory research in the future given the cost-effective benefits of achieving an agile supply chain. Thirdly, this study may also contribute to our understanding of how information-processing capabilities reduce uncertainty in a theory-driven approach, which extends previous studies.

This research will also be expected to have three practical contributions; firstly, the industry will perhaps be more aware of the potential of information processing capabilities in enabling supply chain agility. Secondly, the awareness of the underlying mechanism may be amplified, which may inspire other companies to devise strategies in achieving supply chain agility at a practical level. Thirdly, our findings may perhaps seek to generate discourse and discussion on the different constituent roles in enabling supply chain agility to achieve firm performance.

CONCLUSION AND LIMITATIONS

Although sensemaking and sensegiving are essential to the underlying mechanisms of supply chain process integration, this relationship has yet to be investigated within the order fulfilment context of enabling supply chain agility. This is a recognised area of study when it comes to gaining agility in today's versatile business landscape. As our study on Visy's new capabilities design, with an operational agility in mind, reveals new insights to the underlying mechanisms, we intent to build cumulative research in this area. Presently, we are only working with two large variables recognised for further explorations in conceptualizing the process model for what and how the trigger points of the information processing capabilities can lead to supply chain agility. More category variables maybe recognised for the 'black box' in this model as the development of the supply chain literature progresses. Furthermore experts from future studies may draw more variables from the 'black box' of this proposed model to which maybe verified by further studies. Here the model developed will be subjected to one in-depth case study and will be dependant upon the ability of the research to generalize the qualitative data sourced from this local, potentially internationally scoped, case study. Through conducting similar case studies of other companies in the future, the generalizability maybe improved. This model is open to statistical validation as it is based on an information processing angle to which is not the only means by which variables can be considered to correlate with supply chain agility in this model.

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