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How is Supply Chain Visibility Affecting SME's Operating in International Supply Chains?

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by

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Abstract

Supply chain visibility is generally seen as a positive attribute for individual supply chain partners and the supply chain as a whole. There is limited research on how increasing levels of supply chain visibility can impact individual organizations, particularly smaller entities (SME's). This paper uses an Australasian SME (Orion) as a case study to investigate how increasing visibility is affecting them and the way they operate within international supply chains.

The results indicate that increasing visibility can pose significant challenges and potentially negative consequences for smaller organizations. In addition to the extra resources required and complexity for the SME itself, diverging expectations and a lack of trust between supply partners can negatively impact on supply chain relations and long term supply chain innovation.

Within the supply chains Orion operates, increasing visibility does not appear to be leading to improvements in collaboration, risk sharing or shared goals. Viewed through the lens of Michael Porter's five forces model Orion is in a precarious environment, although there remain options for increased visibility to be used to Orion's advantage.

Keywords – Collaboration and Trust; Porter's five forces; International; Supply Chain; SME; Visibility

Paper Type – Case Study

1. Introduction

In today's global supply chain environment organizations and consumers have high expectations as to the efficient purchasing and transportation of their goods. Organizations such as Amazon have developed sophisticated systems for tracking their goods from order to delivery and both the company and the customer can see the progress of their purchase throughout the entire cycle. This "visibility" brings many obvious advantages. Customers and the company can identify issues, such as non-delivery or transport delays early. Additionally costs can be established and controlled throughout the entire supply chain, particularly with the assistance of global ERP systems. Other drivers to increasing supply chain visibility include increased regulations, such as food safety, health and safety and trends such as ethical sourcing.

There are however potential problems that arise for smaller organizations in attempting to achieve, or contribute to, greater levels of visibility in a larger supply chain. Often supply chains involve many parties and those involved may have disparate systems and processes as well as differing expectations. Dominant players in the supply chain may attempt to impose their systems onto others, raising the costs to these entities and diminishing their ability to remain independent, lean and flexible. Improved supply chain visibility is not limited to understanding where a product is located at any point in time but also allows for the detailed analysis of costs at each step in the process, as well as identifying everyone involved in the process (e.g. sub-contractors).

Traditionally smaller players have established themselves by identifying markets niches (areas where they have specialist knowledge or skills), being innovative or because they can operate more efficiently than larger more bureaucratic and administrative "top heavy" organizations.

Conflicting drivers therefore exist for SME's to participate in initiatives to improve supply chain visibility. On the one hand they lead to improved customer service and reduced costs but on the other hand put more pressure on the income and strategic importance of SME's.

Visibility may reduce their viability, particularly as they often operate in unequal commercial relationships, often relying on confidential information to achieve competitive advantage.

This case study aims to investigate the factors that contribute to or hinder the development of supply chain visibility from the perspective of an SME. Building on a comprehensive literature review, staff carrying out different functions within an SME involved in global supply chains will be interviewed to ascertain what they see as the most significant factors hindering or encouraging supply chain visibility.

It is anticipated that SME's are becoming conflicted as to the net benefits that they will achieve. Initially technological advances alone were seen as improving supply chain visibility (e.g. RFID and ERP) however regulations and other information sharing requirements have also contributed to overall enhancements. These advances however can affect the dynamics of commercial relationships and provide information directly to larger organizations who can use it for their own benefit. This use may be to the detriment of smaller organizations who, ironically, are being asked (or driven) into being key contributors in the drive for global supply chain visibility.

2. Literature Review

2.1 The Supply Chain Concept and Supply Networks

The concept of a supply chain developed in the 1980's and infers different things to different people. Initially the concept focused on single organisations and their ability to integrate, manage and monitor their own manufacturing and logistics activities (Christopher & Peck, 2004; Ketchen & Hult, 2007). It is now more often viewed as involving multiple entities as described by (Barton & Thomas, 2009, p. 930), "In its most basic form, the supply chain is an extended network of suppliers, factories, warehouses, distribution centres, and retailers through which raw materials are acquired, transformed and delivered to customers."

Many new concepts and innovations have contributed to the development of the supply chain over the last few decades including the outsourcing of non-core competencies

(Sobrero & Roberts, 2002), new technologies and globalisation. They are a natural extension to attempts by individual firms to improve competitiveness and further enhance internal productivity (Cao, Vonderembse, Zhang, & Ragu-Nathan, 2010; Harland, Caldwell, Powell, & Zheng, 2007; Vaaland & Heide, 2007). The aim or focus of supply chains has evolved from one of primarily improving operational and logistics efficiency to one of knowledge sharing and industry wide innovation (Angeles, 2009; Miles & Snow, 2007).

By managing the relationships of customers and suppliers at either end of the chain organisations are looking to provide increased value at a lower cost (Bartlett, Julien, & Baines, 2007) and improve their competitive advantage. Often these supply chains have been based around a single large, dominant entity or supply chain leader (Caridi, Crippa, Perego, Sianesi, & Tumino, 2010, p. 372) who is managing many complex relationships with others in the chain. The expansion of supply chains across international borders adds to this complexity (Andersen & Christensen, 2005; Kinder, 2003).

Andersen and Christensen (2005, p. 1261) distinguishes between “supply chains” where this dominant entity or supply chain leader is the central focus and “supply networks” which are “characterised by sets of purposeful and connected exchange relationships, which may change over time as specific actors are involved, deactivated, or reactivated in the performance of production tasks.” Rather than being focused on a dominant entity (often the final product producer) who manages a reasonably static group of feeder organisations, a supply network is more dynamic and changes over time.

A key dynamic is the relationship between these changing entities. Organisations often assume that the relationships they enter into will improve their competitiveness however differing expectations and beliefs (Andersen, Christensen, & Damgaard, 2009) may result in less success than anticipated. More information does not automatically result in improved performance (Jonsson & Mattsson, 2013) and often SME’s find it difficult to achieve the returns they are looking for to leverage their resources (Tokman, R. Glenn Richey, Morgan, Marino, & Dickson, 2013, p. 272). This may be because the integration

of information is not particularly well developed (Fawcett & Magnan, 2002; Harland et al., 2007). Contributing factors to this may include; the differing goals of entities within the supply chain, entity size, unbalanced risk and reward (Bagchi & Skjoett-Larsen, 2003) as well as the SME's own internal integration (Flynn, Huo, & Zhao, 2010).

2.2 SME's and Their Role

SME Definition

Small to medium sized businesses (SME's) vary in definition from country to country. In the US they are generally regarded as having up to 500 employees whereas in New Zealand, where 99% of companies employ less than 50 staff, an SME is regarded as having fewer than 20 employees. Irrespective of their absolute size SME's are often relatively small in comparison to other parties in an international supply chain. SME's are regarded in many national economies as the cornerstone of economic growth and employment (Bayraktar, Demirbag, Koh, Tatoglu, & Zaim, 2009; Eyaa, Ntayi, & Namagembe, 2010; Y. Lee, Shin, & Park, 2012; Voudouris, Lioukas, Makridakis, & Spanos, 2000). They often have limited cash resources as a result of pressure from larger partners to accept longer payment terms and to take on board the risk of carrying inventory (Hall, 2010).

Networks of small to medium enterprises (SME's) maintain many relationships (spatial, vertical, horizontal and cross-sectorial) and these relationships produce many benefits such as accumulating tacit knowledge and know-how (Kinder, 2003, p. 504) and becoming clusters of innovation.

2.3 How Supply Chains Impact SME's

Belonging to an effective supply chain can potentially deliver a range of benefits to an SME through vertical integration without incurring significant ownership costs. They can leverage off economies of scale and diversify risk. Just-in-time (JIT) supply chains are noted by Kinder (2003, p. 505) as featuring "active partnering, characterised by resource procurement and beneficial knowledge exchanges."

On the other hand the SME can be subject to increased levels of control (Arend & Wisner, 2005), increased costs of coordination and inflexibility (Das, Narasimhan, & Talluri, 2006). The supply chain is often technically more complex, encompassing multiple workflows, and more intensive information requirements (Wu, Chuang, & Hsu, 2014). SME's by definition are likely to have less resources, such as human and technical capital (Hall, 2010), for dealing with international supply chain requirements and their complexities. SME's have a tendency to underestimate these complexities when entering into collaborative relationships. Larger companies can exert significant influence over smaller partners to become involved in, and implement policies, in areas they might not otherwise engage (e.g. corporate social responsibility) (Ayuso, Roca, & Colomé, 2013).

Impact on Entrepreneurial Spirit and Innovation

Miles, Miles, and Snow (2006) noted that Joseph Schumpeter posited over 80 years ago that innovation is the primary driver of economic development. However Miles et al. (2006, p. 2) asserts that continuing innovation is difficult to achieve within a single entity. A single organization will only manage periodic innovation based around its existing businesses. What is needed to drive continuous innovation is a larger organizational process occurring outside "a firm's traditional boundaries" which involves knowledge sharing and collaboration.

Collaboration and Trust

Cao and Zhang (2011, p. 174) define supply chain collaboration as "seven interconnecting dimensions that make up effective supply chain collaboration: information sharing, goal congruence, decision synchronisation, incentive alignment, resource sharing, collaborative communication, and joint knowledge creation". Collaboration has been viewed by many as a positive business strategy, which has been pursued with vigour, despite significant failure rates in collaborative alliances (Anderson & Jap, 2005).

Achieving strong individual returns for a business has often been attempted by placing suppliers in competitive bidding environments and using the information around quality and price, etc. to negotiate the best deal. Suppliers are encouraged to compete aggressively

and there is likely to be an adversarial relationship between the business and the suppliers (Bayraktar et al., 2009), particularly where products are commodities and decisions are made primarily on cost (Bartlett et al., 2007). Collaboration and trust are not the natural consequences of such relationships which are more likely to be short-term and/or uncertain in duration.

When Bartlett et al. (2007) investigated Rolls Royce he found that global purchasing had been successful in delivering price reductions and savings to the bottom line. However this success had been to the exclusion of other performance measures such as supplier quality, supplier delivery performance and supplier base reduction targets. The result was an overall deterioration in the relationships between Rolls Royce and their suppliers.

There has been a trend for buyers to develop a strategy of using few suppliers (Chen & Paulraj, 2004; Koh, Demirbag, Bayraktar, Tatoglu, & Zaim, 2007) in order to achieve greater value for the buyer. This type of strategy suggests the desire for a longer-term and closer relationship with a limited number of supply chain partners.

The relationship between collaboration and supply chain performance relies on firms adopting a “win-win” outlook which is often in contrast to their competitive instincts (Cao & Zhang, 2011). This level of collaboration is regarded as more than mere cooperation where contractual outcomes are reasonably defined and rewards negotiated (Miles et al., 2006; Whipple, Frankel, & Daugherty, 2002; Zahedirad & Shivaraj, 2011). Collaboration is a more complex relationship which is likely to include trust, honesty and equity, with unpredictable outcomes that are generated through collaborative entrepreneurship involving open sharing of ideas and information (Goffin, Lemke, & Szwejcowski, 2006). Many studies have highlighted that seller-purchaser relationships often rely on trust as opposed to strictly legal and commercial agreements (Sobrero & Roberts, 2002).

Mutual trust is a necessary pre-cursor for knowledge sharing (Harland et al., 2007) and it is claimed that such trust can create resources which lead to competitive advantage (Faisal, Banwet, & Shankar, 2006). Goffin et al. (2006) emphasises that in addition to trust, other

prerequisites to trust are required to maintain long term close relationships such as ethical behaviour, open communication, clear expectations and open data sharing.

When these prerequisites are not maintained some or all of the participants can suffer. Rossetti and Choi (2005) provide an example in the aerospace industry where manufacturers orchestrated their parts suppliers into becoming dependent on them and then used their position to squeeze the part supplier margins. The result was that the parts suppliers began by-passing them and selling directly to end users which dramatically and negatively affected the manufacturers returns.

As not above (Bartlett et al., 2007), Rolls Royce had achieved individual benefits to the detriment of the relationship with their suppliers. However, Rolls Royce began to understand that this had negatively impacted on collaboration and communication within the supply network leading to significant productivity issues. By re-inventing their relationship with their suppliers and considering the impact of decisions across the supply chain they were able to solve their productivity issues to the benefit of all parties. Initially Rolls Royce blamed their suppliers for late deliveries whereas the suppliers blamed Rolls Royce for changing their requirements and making forecasting difficult. By recognizing they were part of the problem Rolls Royce was able to increase visibility of the issues they faced. The suppliers also recognized that they contributed to this problem, as Rolls Royce often re-scheduled due to late supplier deliveries.

Diverging Expectations

According to Willis (1998) “a successful partnership will not only lead to improved customer service but also to better utilization of resources, a reduction in inventory investment, and a reduction in emergencies, better working relationships, and increased profit for all links in the supply chain”. However as pointed out by Johnsen (2005) businesses in a two-way relationship will experience pressures to achieve self-serving goals as well as attempting to balance this with the benefits available through close interaction and collaboration. In fact most supply chain participants will act in ways that benefit themselves ahead of selecting options that will benefit the supply chain

(Narayanan & Raman, 2004). The only way to reverse this decision making process is to ensure that the interest of the partners are in sync, for example by contractually aligning risks and benefits (Ketchen & Hult, 2007). An example is provided by Vollmann and Cordon (1998) who quote a contractor to British Petroleum whose £300,000 contract was a minor cost but was crucial to the success of the project. They offered the contractor a 3% share of any savings BP achieved through the on-time successful delivery of the project. By ensuring this occurred the contractor earned another £400,000.

It has been suggested that at a management level individuals operate based on the business practices that are inherent in their own society and that these become institutionalized and difficult to change (Zucker, 1987). Business relationships in international supply chains will be impacted by international cross cultural differences where local business practices are “social constructs rather than universal laws of business conduct” (Andersen et al., 2009, p. 815). What may be regarded as normal or accepted by business managers locally may not correspond with similar expectations of other supply partners. This may impact, for example, on the reaction to being asked to supply certain types of information and how the use of this information is viewed as acceptable.

2.4 Supply Chain Visibility

Information Sharing and Visibility

Supply chain visibility is often thought of primarily in relation to the tracking of objects moving through the supply chain (Atkinson, 2010; Delen, Hardgrave, & Sharda, 2007; Geerts & O'Leary, 2013). Even within a single organization however visibility can have different meanings to different groups (Francis, 2008). We focus in this paper on a wider definition involving general information sharing as summarized by Barratt and Oke (2007, p. 1218) who refer to supply chain visibility as “the extent to which actors within a supply chain have access to or share information which they consider as key or useful to their operations and which they consider will be of mutual benefit.”

Information sharing can be viewed as an activity (Barratt & Oke, 2007; Jonsson & Mattsson, 2013) and visibility the result, which benefits the supply chain as a whole.

Effective information sharing is viewed as key to effective supply chain practice (Zhou & Benton Jr, 2007, p. 1348) but of itself does not result in supply chain visibility. To be truly valuable the information shared needs to be accurate, trusted, timely, useful, and in a readily usable format (Barratt & Oke, 2007). Furthermore this shared information must be incorporated into the decision making process and hence lead to improvements which are beneficial to all parties.

Visibility provides a range of advantages, not only in terms of operations efficiency (Caridi et al., 2010) and resource productivity (Christopher & Lee, 2004; Småros, Lehtonen, Appelqvist, & Holmström, 2003; Yu & Goh, 2014), but also improved planning proficiency (Petersen, Ragatz, & Monczka, 2005), and customer service (Daugherty et al., 2006). An organization may be involved in numerous relationships, both within a single supply chain, and across multiple supply networks. The level of visibility will inevitably vary across these interactions and will be influenced by the strength of a particular relationship, gained through the effort spent, the resources committed, procedures successfully established, and the commitment of the parties involved and over time the trust established in the relationship (Barratt & Oke, 2007, p. 1230).

Over a decade ago Sabbath and Fontanelia (2002) (as cited in Daugherty, 2006) questioned the effectiveness of supply chain relationships by stating “...supply chain collaboration is at the same time the most used, the most frequently misunderstood, the most popular — and the most disappointing — strategy that has come along to date.” Bartlett et al. (2007) notes that an illusion of visibility may be created if greater information is generated, however not only must the information be accurate, but it must be able to be analysed and used for decision making.

While the majority of literature outlines the potential benefits of improved visibility there has not been significant research carried out on how to measure the benefits of such visibility (Caridi, Moretto, Perego, & Tumino, 2014). This can make it difficult for organizations to ascertain whether the cost involved in achieving visibility is offset by the resulting benefits. Jonsson and Mattsson (2013) point to a similar lack of research on the

negative impacts of information sharing or the process of “managing” collaboration. If there are negative consequences to the sharing of information then understanding this could be beneficial to individual organizations and supply chains as a whole.

2.5 Best Value Supply Chains

The literature review has indicated that effective visibility within the supply chain can be beneficial and that achieving this should be in the best interests of all participants. If there are problems within a supply chain then everyone will suffer. Hendricks and Singhal (2003) analysed the stock market reactions to over 500 announcements of problems caused by supply chain “glitches”. They found that the average decrease in shareholder value was 10%. They also found that smaller firms were affected to a greater degree. In order to avoid some of the short-comings of traditional supply chain behaviours, such as self-interest and opportunism, the concept of “Best Value Supply Chains” is proposed by Ketchen and Hult (2007). Purchasing decisions are not focused on the short-term costs but on the total long term costs in best value supply chains. “Strategic supply chain management elevates supply chain management from a function that supports strategy to a key element of strategy” (Ketchen & Hult, 2007, p. 574).

The ultimate vision was painted by Miles et al. (2006, p. 1) which looked forward four years to 2010 envisaging a supply chain network (of 13,000 entrepreneurs) working in “collaborative entrepreneurship” with performance driven by continuous innovation in products and services. This imagined group had a strategy of “investing in people; supporting a collaborative, entrepreneurial culture; and finding and growing new markets around the world”. Four years further on from the deadline for this futuristic scenario and there is no literature to indicate this prediction has either already materialised or is any closer to becoming a reality than it was in 2006.

Rather than existing in a supply chain utopia, the profitability of many participants is governed by the five factors outlined in the five competitive forces model of (Porter, 1979). This model looked at how strategic managers have to respond to five forces, namely; the threat of new entrants, the bargaining power of suppliers, the bargaining power of buyers, the threat of substitutes, and rivalry among existing competitors.

Reviewing an industry within this framework offers insights into the bargaining power of individual organizations (Pines, 2006) and analyzes the “attractiveness” of an industry (H. Lee, Kim, & Park, 2012).

3. Case Study

3.1 Organisation Background

Orion is an SME (approximately twenty staff) based in Australasia that has operated for over twenty years. It is a product broker and logistics provider within supply chains spanning the globe. Most customers are in Australia or New Zealand however the suppliers and transport organizations are based in many countries throughout Asia, Europe and the Americas. Although the organizations involved in each supply chain vary in size, Orion is often small in relation to other supply chain partners, particularly the customers who are often part of global multinationals.

Started by the current owner, the organization grew from a small team of three who covered sales, purchasing and logistics. Business involved contracts negotiated via fax with a minimum of information required for import and other regulations. The process of being accepted as a supplier was far less rigorous. If the product sample was deemed acceptable by the customer and the price competitive, then a contract could be concluded without further significant requirements. The Australian Sales Manager recalls that “...historically we never had to tell anyone where we bought anything from. That was proprietary information.”

The effort in time and money that Orion expended in finding suppliers and products was a valuable asset that was protected by only disclosing the minimum information required to secure the business. As a significant proportion of the product is of a commodity type (e.g. oil) and supplied in bulk (i.e. not packaged for retail sale) the information required by end-users was not extensive. The price paid by the customer was a delivered price and as long as this price was competitive then the constituent parts (product, international freight, local freight, etc.) were only visible to relevant organizations within the supply chain. The

actual freight component was only a matter between the Freight Company and Orion, etc. As a consequence visibility of this information did not exist within the wider supply chain.

Additionally there was less information requested and/or available around many areas including; product ingredients (e.g. GMO and allergies), sustainability and eco-friendliness, ethical behaviour and market requirements such as Kosher and Halal. Consumer demand has had a significant impact in forcing supply chains to gather such information, either directly by pressure on organizations within the supply chain (e.g. supermarkets) or through the gradual increase in legislative requirements.

While fitting the definition of an SME, Orion is also large enough to deal with a significant proportion of players within their industry sector. They have many of the multinationals operating in Australasia as customers as well as a range of medium and small businesses. The suppliers from whom they source product display a similar array of size and influence. Relationships cross supply chains forming a constantly changing series of interconnected supply networks.

3.2 Methodology

Semi-Structured Interviews

From the literature review it was apparent that many theoretical perspectives have focused on the benefits of supply chain visibility (Choi, Li, & Wei, 2013; Du, Lai, Cheung, & Cui, 2012; Johansson & Melin, 2008; Kinder, 2003) and how such greater visibility can be achieved (Kaipia & Hartiala, 2006; Prajogo & Olhager, 2012; Prajogo & Sohal, 2013). More recent literature discusses the development of competition between supply chains rather than between individual organizations. In the majority of the literature it is implicitly assumed that the benefits of improved information sharing and visibility will accrue across all parties within the supply chain.

To investigate further the impact of enhanced information sharing we opted to carry out in-depth semi-structured interviews, as opposed to a wider survey, in order to obtain more comprehensive information. Such interviews have been identified as being well suited

when studying supplier relationships (McCutcheon & Stuart, 2000). The interview questions used in the interviews are included as Figure 1.

Interview Questions

1. What is your formal role within the organization and has this role changed due to the changing information sharing requirements of the supply chains you operate within?
2. How do you view your organization in terms of the size and the contribution it makes to the supply chain/s you operate within?
3. What skills or value are you offering to supply chains and is this value being enhanced or eroded as supply chain visibility increases?
4. How do you currently share information throughout the supply chain?
 - a. As part of your role within the organization?
 - b. In other areas of the organization you are aware of?
5. What factors do you believe increase information sharing within the supply chains e.g.
 - a. Legislation
 - b. Desire for individual organizations to “protect” themselves from the actions of others
 - c. Consumer demands
 - d. Desire to benefit the supply chain as a whole
 - e. Desire to maximize individual organization returns within the supply chain
 - f. Entity size, power, etc.
 - g. Information Technologies
 - h. Confidentiality and Trading Agreements
6. What factors hinder information sharing within the supply chain?
7. How does your organization benefit from having information made more readily accessible/visible by others in the supply chain?
8. How does your organization suffer from having information made more readily accessible/visible by others in the supply chain?
9. Overall how is visibility within the supply chain impacting on your organization’s competitive advantage?

Figure 1. Interview Questions

Although the questions in Figure 1 were derived independently after reviewing general supply chain literature, it was subsequently encouraging to observe that there is a resemblance in substance to those used in Barratt and Oke (2007) in relation to the retail sector. All the senior managers in Orion were interviewed, which encompassed the

functions of Quality Management, Purchasing, Logistics and Sales. Interviews took a minimum of 45 minutes but there was no upper time limit enforced and interviewees were provided with as much time as required to explore and expand on the questions.

3.3 Analysis of Data

Question One – How have your roles changed due to information sharing?

Participant's responses were unanimous in acknowledging that their individual roles had changed due to the significant increase in information sharing requirements within the supply chains they operated. As noted by the Purchasing Manager, "You have to have all your ducks lined up before you can proceed with anything." The range of information required is much wider, encompassing commercial contracts, packaging, labelling, bar coding, product analysis and testing, food safety, health and safety, ethics, and sustainability. Orion has become more of an information gatherer and spends a greater proportion of its time collecting information from the supplier, and other sources, that the customer needs for their own processes.

Working in a small organization the Sales Managers are finding they are required to interact with individuals carrying a wider range of roles for their supply chain partners. They have become a key cog in receiving and distributing requests for information. The Australian Sales Manager stated that "Today I had to deal with an organization our customer has employed to manage their information for them!" The information is generally regarded as flowing one-way (i.e. there is no reciprocal flow) and it is becoming more difficult to work within the timeframes stipulated for obtaining data. A greater volume of information is being demanded and the additional detail being requested is viewed as adding less and less value but requiring disproportionately more resources to achieve compliance.

The increased transparency enabled by information sharing has resulted in Orion feeling more vulnerable within supply chains. A commonly expressed view was that "We are required to be more open about our suppliers and this subsequently allows customers to approach them directly". What was previously regarded as confidential or proprietary

information is now required to be disclosed by Orion to other supply chain partners. While generally viewed in a negative light this trend has forced the managers at Orion to reconsider the value proposition they are providing to a supply chain. Orion could not continue to retain exclusive relationships just by concealing sourcing information. The NZ Sales Manager identified the need for his role to continually contribute to product innovation in order to remain valuable.

Question Two – Organization size within the supply chain and what is its contribution?

The interviewees considered that for the most part they were a small organization in supply chains containing other larger organizations. Orion operates in many supply networks which can overlap and several participants commented that sometimes they could consider themselves a dominant entity in a supply chain. Two participants suggested that in some situations they didn't think they would be considered small because of the importance of the products they source for the supply chain and the significance of the information they provide. Being in varying positions of dominance in discrete as well as overlapping supply networks allowed the participants to provide examples of contrasting experiences and behaviours.

Question Three – What value are you offering to the supply chain and is this value being enhanced or eroded by supply chain visibility?

The consensus was that Orion's value was as a solution provider. "We offer flexibility via Long-Term Contracts" (Territory Sales Manager) and "We present products and ideas to customers that they would not otherwise be aware of" (Australian Sales Manager). Orion matched suppliers with customers and presented solutions that both parties would not otherwise have contemplated. They are able to offer intimate knowledge that other organizations do not have the time or resources to develop and provide flexible solutions such as just-in-time long-term contracts. Only the Quality Manager directly referred to providing information as an area of value they were delivering to their partners. There was unanimity among interview responses that the perceived value Orion is offering its partners is being eroded as visibility increases within the supply chain. In particular it was felt that multinationals were actively using increased visibility as a tool to reduce the need

to engage the services of Orion.

Question Four – How do you currently share information throughout the supply chain?

There was recognition of the many ways that information was shared and thereby creates visibility in the supply chain. Most often quoted were information sheets relating to the products supplied such as the Product Specification Sheets (“specs”), Certificates of Analysis (COA’s), and the Australian Food and Grocery Council Product Information Forms (PIF’s). Participants noted the increasing requirement to complete customer questionnaires and tender documents which were requesting not just product information but also detailed organizational financial, insurance and operational information. The NZ Sales Manager commented “before it was just the large customers but now the smaller ones are asking the same questions. I’m dubious how useful it is for them.” New requests include the provision of ethical, environmental and sustainability data, employment practices, compliance with local labour laws, transport chain of responsibility legislation and product traceability.

Question Five – What factors do you believe increase information sharing within the supply chain?

The two factors that all participants identified as predominantly increasing information sharing were legislation and consumer demand. As Orion operates in the food industry both of these areas have generated large increases in the demand for information and transparency. The interviewees recognised that organizations were attempting to protect themselves from the consequences of breaching the law or suffering adverse publicity. The reality of operating in international supply chains means information collection occurs across multiple organizations, different national legislation, differing cultures and languages. No feedback was received which supported the proposition that increased information sharing was carried out to benefit the supply chain as a whole. The closest anyone came was “it’s possible...but no not really”.

The only question which elicited differing views between participants was whether information sharing increased in response to individual organizations attempting to

maximize their own returns. In part this was due to whether the respondent was considering Orion, or other organizations within the supply chain. The Sales Managers view was that it is in Orion's best interests that less information sharing occurred whereas they acknowledged that for their larger supply chain partners there would be a preference to have greater information visibility. The Purchasing/Logistics Manager had a more traditional view which sees greater information a prerequisite for efficient logistics which in turn benefits individual organizations. The Quality Manager had a unique response and felt that increased information collection could lead to a false sense of knowledge and replace the use of informal communication and sharing of implicit knowledge.

The size and power (interpreted as synonymous) of organizations is seen by all participants as being positively linked to their ability to obtain information from other entities. "If you don't provide all the information multinationals ask for in a tender, no matter how unreasonable, then they don't even consider you" (NZ Sales Manager). Apart from size, the Quality Manager highlighted that the location of the supply chain partner also influenced their determination and ability to increase information sharing e.g. the USA through legal requirements they were able to effectively impose on organizations in other countries.

Information Technology was acknowledged by all participants as having increased the amount of information sharing but there was a concern expressed several times that the quality of the data was questionable e.g. "...sometimes answers are given just to complete the forms."

Trading Agreements and terms and conditions are a topical area at Orion as many of their trading partners are attempting to change the current terms they operate under. Participants indicated that they had seen a general trend to try and impose greater obligations and more onerous terms on partners within supply chains. This is seen as a reflection, partly, of the increase in legislation and consumer demands noted above, and partly to a more aggressive approach being adopted by larger organisations. Examples of clauses included; a) an obligation to make savings and a guarantee that 100% of all savings would be passed on to the supply partner, b) an obligation to price based on the full tender volume and be

fully resourced and staffed to deliver at any time during the contract period. The supply partner conversely has no commitment to take any minimum volume of the tender quantity, and c) if the supply partner finds a better price then the supplier has 15 days to match the price or the supply partner can walk away from the contract and change to the better priced supplier.

Respondents had an adverse opinion of this development seeing it as an attempt to unfairly control others in the trading relationship. It made them more likely to refrain from sharing information and thereby avoid the information being used in a way detrimental to them. The Australian Sales Manager saw it as ironic that at the same time organizations were requesting more information there was also a corresponding increase in the demand from the same organizations to sign wide ranging confidentiality agreements. The increase in the use of confidentiality agreements was also noted as causing potential conflicts when you are operating in multiple supply networks.

Question Six – What factors hinder information sharing within the supply chain?

Factors that hinder information sharing were named as; the cost of gathering data, language and cultural differences, distance and international time zones. However in all responses the key element identified was a lack of trust. From the standpoint of Orion confidentiality agreements depended on a good faith observance by the other party. They were aware larger organizations could take legal action for breaches however this is costly and time consuming and requires significant resources. Even if damages were awarded it is difficult to enforce payment in the international jurisdictions in which they operate. If Orion cannot trust that the information will not be used in a detrimental fashion (e.g. leaked to competitors or used to deal directly with suppliers) then there is a reluctance to share it with other organizations.

Question Seven – How does your organization benefit from having information more readily available / visible by others in the supply chain?

Most respondents could articulate some benefits of having information more readily accessible to others in the supply chain. Responses focused on mutual benefits where each

party was able to understand the others capabilities and weakness, identify areas for improvement and target potential opportunities. The Quality Manager noted that having to achieve the level of information sharing required could make it more difficult for new competitors to enter the market.

Question Eight - How does your organization suffer from having information more readily available / visible by others in the supply chain?

From an operational perspective the Purchasing/Logistics Manager did not see any downsides to having more information available. Commercially, however, all the participants regarded the availability of more information as a tool that could be used against them. "It can make us more exposed" (NZ Sales Manager) and "...it encourages the belief that we are not necessary and can be cut-out" (Territory Sales Manager). There was a universal conviction that the information would be primarily used to identify and reduce Orion's profit margins.

Question Nine – Overall how is visibility within the supply chain impacting on your organization's competitive advantage?

Despite the conviction held by the respondents that increased visibility was primarily a tool that can be used to reduce their profitability they also expressed the conflicting view that such information sharing could improve their competitive position. As stated by Li, Ragu-Nathan, Ragu-Nathan, and Subba Rao (2006, p. 111) "Competitive Advantage is the extent to which an organization is able to create a defensible position over its competitors". As their supply chain partners could see that Orion's prices were reasonable they were less likely to go elsewhere. There is now considerable effort, cost and time required in providing the information essential to even be considered as a supply chain partner (the supplier-product approval process) and this favours the incumbent. If the role of broker/logistics provider is no longer viewed as useful within the supply chain then the increased information visibility will potentially aid in the process of removing Orion and allowing other partners to deal directly with each other. If the role is still seen as useful then the effort in providing the information may help protect Orion from competitors.

4. Discussion of Results

Diverging Interests and Expectations

The cumulative actions being taken by dominant supply chain partners is leading to a divergence rather than an alignment of the interests and expectations between Orion and their partners. The Managers interpret these actions as being focused on short-term profit rather than longer-term relationship building. None of the managers believed that any of the increasing requirements for sharing information were being implemented with the aim of achieving mutually shared benefits.

Trust

There is a widely held belief at Orion that the more information that is provided to other supply chain partners the more it is likely to be used by these partners to either reduce Orion's profit margins, or to cut Orion out of the supply chain entirely. The feedback they receive leaves them feeling that the service they undertake is not highly valued and this undermines the level of underlying trust in these relationships. The consequence of this is that information will be withheld unless it is specifically requested and that attempts may be made to conceal or "fudge" data that could be used to their own detriment.

Larger organizations (most often multinational customers) appear to be forcing increasingly onerous terms of supply onto other members of the supply chain. These agreements do not encourage collaboration but rather attempt to transfer the majority of the risk onto their supply partners while simultaneously retaining the bulk of the reward for themselves.

Innovation

It was suggested by one interviewee that increasing visibility had a positive impact on innovation. Interestingly they saw this not as a result of improved information sharing leading to innovative development. Rather, in order to preserve partnership value there is a need for Orion to be seen as an innovator instead of obtaining its competitive advantage from the accumulation of information unavailable to other organizations.

Most participants felt that the increase in data collection has put time pressure on all parties and that the data collected focuses on meeting legislative and consumer information requirements. The “data collection overload” is not allowing time for the personal knowledge exchange that contributes to implicit knowledge creation. The impression gained is that Orion has transitioned from being primarily a logistics provider to being a supplier of innovative products and product knowledge. This role of innovator however is not explicitly valued or rewarded by the supply chain.

Overall the emphasis of data sharing appears to remain focussed on data collection to meet compliance obligations. Virtually all of the data flowed in one direction and was reactive in nature i.e. when it was demanded it was provided. Feedback on the mutually beneficial application resulting from the collection of information was not received from any of the interviewees.

Strategically it appears to be in the best interests of the supply chain for Orion to succeed in delivering innovative products and ideas. Orion however is rewarded based on its logistics activities and these are regarded by Orion as being threatened as a result of increasing supply chain visibility. In order for Orion to become more secure they need to be seen as an important part of product development and not just logistics.

The Territory Manager used the illustration of a supplier who had started to send out newsletters containing examples of how their ingredient had been used in products around the world. Although this provided useful information it did not offer a strong incentive to continue to refer back to that particular supplier as opposed to other suppliers of the same product. Information was not specific the customer, it was forwarded and copied without traceability.

One potential strategy for Orion would be to combine this concept with a more sophisticated information technology initiative. For example Orion might create a food technology database that current customers were able to access for products available from Orion. If this database was a source of information required for product

assessment and production planning, possible ideas as well as technical advice and tips then this would be an obvious source of added-value for the customer. If you were no longer a current customer then you would no longer have access to this database.

Best Value Supply Chains

The literature review pointed to a vision of strategic supply chains that focused not on short-term costs but rather on long term outcomes. These “best value” supply chains had evolved from information collectors, primarily aimed at improving logistical and operational efficiency, to collaborative entities promoting knowledge sharing and innovation. The findings in this study point to a significant gap between the current realities for an SME participating in modern supply chains and the “ideal” supply chain relationships.

Contracts are not concluded in a manner that ensures “partners share risks, expenses, and benefits equally” (Ketchen & Hult, 2007, p. 575). Orion is being pressured to take on greater risk for lower return because larger partners are using their market position for their own advantage. This pressure does not encourage collaborative entrepreneurship or a sense of unified purpose but instead perpetuates a culture of self-interest.

In terms of the five forces model of Porter (1979), Orion is faced with challenges from all five forces (the threat of new entrants, the bargaining power of suppliers, the bargaining power of buyers, the threat of substitutes, and rivalry among existing competitors). The low cost of entry makes the threat of new entrants significant, particularly in relation to commodity products. Capital investment is low, there are not substantial switching costs, and little brand loyalty. The increase in information sharing is both an advantage and a disadvantage. Information visibility can make finding and switching between suppliers easier and eliminating the need for the services of brokers. The cost of collecting information and regulation compliance can however become a barrier to entry. Providing quality information and ensuring full legislative and consumer compliance appears to be a key strategic consideration for

Orion. Entrenching the information exchange in integrated systems with other supply chain partners would make switching away from Orion more costly and less attractive.

The bargaining power of suppliers within the supply chain is often relatively weak. Suppliers are often from third world countries offering commodities which cannot be differentiated easily. Customers do generally have a range of options of supply. As Orion is brokering supplier products to supply chain customers they inherit the same fragile bargaining position as the supplier. If the relationship between Orion and the supplier is not strong then this decreases their overall bargaining power with customers even further. There is a lack of established exclusive distribution contracts with suppliers and the absence of mutually beneficial relationships results in diverging expectations and distrust. The bulk of information flow is through Orion collecting information from suppliers to meet customer demands and the NZ Sales Manager notes that not a lot of information is fed back to the suppliers.

A significant percentage of Orion's customers are large multinationals with considerable power. Ever increasing demands for information mean that the cost of collecting and providing data increases at the same time there is pressure to reduce profit margins. Simultaneously as margins are reduced there are demands for increased quality. The trend for consolidation has meant that the number of customers has decreased (e.g. supermarkets and manufacturers) resulting in oligopolistic markets. The bargaining power of these customers has led many to impose very specific and onerous terms onto Orion such as the level of insurances they must hold and the risk they must carry (e.g. all consequential losses for any delays and taking back unused product).

In today's markets there are often substitute products that can be obtained which have different quality and price combinations. Their growth has been impacted recently by raised consumer expectations (e.g. palm oil and saturated fats) and increased information exchange and resulting visibility can be used to differentiate products and services to take advantage of this. Having visibility that supports ethical sourcing and

nutritious ingredients can raise barriers to substitute products. Being part of this information chain makes it more difficult to be substituted.

The industry that Orion operates within has a high degree of rivalry. Low cost barriers to entry for brokers mean that there are many such organizations competing for business. Customers and suppliers are also often in fiercely competitive markets (e.g. supermarkets) and this competition tends to drive down prices and reduce margins. The cost of providing more detailed information is increasing and this reduces margins even further.

5. Conclusion

There are many reasons why supply chain visibility is increasing within supply chains and broader supply networks. External influences such as legislation and consumer demand for information are significant contributing factors. The need to provide information on areas encompassing food safety, ethical sourcing, sustainability, and religious constraints has placed a substantial burden on SME's. Larger organizations (particularly those whose consumers are the general public) are facing increasing risks for not complying with legislation, or consumer expectations, and are attempting to pass the majority, or all of this risk, onto other supply chain partners. They are using information sharing as a tool to identify these risks and implementing burdensome supply agreements in order to transfer the consequences of non-compliance from themselves.

For SME's operating in international supply chains this means that they are often trying to negotiate with partners in multiple countries and having to deal with multiple legal systems, cultures and ethical standards. For example Orion signs contracts to purchase products from Malaysia and then sells the product to customers in Australia. These customers may be part of multinational organizations with terms that specify compliance with American labour laws. This imposes complexity in terms of collecting the correct data, communicating requirements and enforcing non-compliance.

Within supply chains larger organizations are also requiring greater transparency and far more information than ever before from their supply partners. The range of data that entities are being obligated to provide has expanded to include data previously regarded as proprietary. The majority of the information flow is one-way and not cooperatively designed to improve the performance of all the supply chain members. The larger supply chain partners are focussing on information sharing as a way of meeting their own objectives rather than for the benefit of the supply chain as a whole.

This inward facing focus results in a low level of trust among partners. The larger organizations attempt to impose greater requirements in the hope of achieving greater visibility while SME's endeavour to avoid providing information on the basis that it might be used against them. The result is an overload of data collection which hinders supply chain efficiency and confidence in the information gathered.

There is some evidence that the increased pressure visibility is placing on an SME to perform might encourage them to become more innovative in order to maintain their value to the supply chain. There are two reasons however why this result is unlikely to be sustainable. Firstly, there is no system within the supply to reward successful innovation and secondly, the lack of underlying trust and equity means that the sharing of any innovation within supply chain is hindered.

When viewed through the lens of Porter's five forces model Orion is faced with multiple threats from new entrants, low supplier bargaining power, the threat of substitute products, intense competition and powerful customer bargaining power. The challenge for Orion is to maximise visibility as a tool to integrate themselves within supply chains and reduce these threats. Options such as developing customer information portals and feeding information back to suppliers may assist in achieving this aim. Leading the way and attempting to establish more mutually beneficial relationships and information exchange with suppliers may help offset the threat posed by large customer bargaining power.

This study suggests that for an SME operating in an international supply chain the trend for increasing supply chain visibility is providing greater challenges rather than delivering benefits. The “utopia” of supply chains working in unison for a better combined outcome continues to be an elusive goal, thwarted by an underlying lack of trust and mutual sharing of risk and reward.

This case study’s conclusions have significant limitations in terms of generality due to the small interviewee sample of participants from a single SME operating in the food industry. A large proportion of products involved in the supply chain are commodities and these types of supply chains have historically been more likely to adopt an aggressive and adversarial approach (Bartlett et al., 2007). It would be useful in future studies to expand on both the number of participants and the range of industries canvassed.

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