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# EMPOWERMENT OF SUPPLIERS THROUGH EFFECTIVE AND STRATEGIC USE OF INFORMATION SYSTEMS AND TECHNOLOGIES

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## Abstract

*This paper discusses the concept of supplier empowerment from the perspective of practitioners and the use of information systems and technologies in empowering suppliers. The paper is based on studies conducted in 18 companies in Europe and the US. Interviews were conducted with supply chain and IT managers in companies operating in automotive, aerospace, electronics, and fast-moving consumer goods industries as well as their suppliers and IT vendors. The interviewees view that it is now getting increasingly more challenging to manage complexities in the upstream compared with downstream market. Looking at it from a supply network perspective, it makes more sense for the entire network if the tasks related to upstream activities are empowered to suppliers. However this would require a high level of trust among supply partners, transparency and visibility of information, and effective and strategic use of information systems and technologies. With effective empowerment of suppliers, companies would be able to better focus on improving the management of downstream market and customers. Use of concepts and technologies such as vendor-managed inventories and supplier portals are common examples of enabling technologies to achieve this.*

**Keywords:** Supply Chain Management, Information Systems, Information Technology

## 1.0 Introduction

The evolution of supply chain strategies and practices has focused mainly on the effectiveness of collaboration and integration with suppliers and customers. Be it lean or agile, integration has always been the key enabler to improving key performance indicators of any customer-supplier relationship. Previous research, for example, has

indicated the direct association between the degree of integration with performance improvement (Frohlich & Westbrook, 2001) and an indirect association with firm performance via customer service as the mediating factor (Vickery et al, 2003).

This paper is based on fieldworks performed through interviews at 18 companies in Europe and the US. The paper discusses the concept of supplier empowerment and the use of information systems and technology in empowering suppliers as evident in these companies. The following sections include the extent literature on the topic, the methodology adopted, analysis of findings, and summary and conclusions.

## **2.0 Literature Review**

Supply chain collaboration has been defined as an attempt to achieve integrative settlements between transacting parties through integrations of behavioural, communicational, and interactive flows (Morash & Clinton, 1998). Computer Science Corporation (CSC), in their survey, noted that there has been a steady increase in the amount of inter-organizational transactions done electronically, and that “connecting to customers, suppliers, and/or partners electronically” is one of the top ranked global management issues (CSC, 2001).

The effectiveness of integration does not happen in vacuum and requires a conducive and supportive environment. These environmental dimensions may include the level of integration with internal and external operations, and the level of alignment with other supply chain settings such as geographical dispersion, the demand pattern, and the product characteristics (Holweg et al, 2005). Other factors such as strategic supplier partnership, customer relationship, level of information sharing, quality of information sharing, and postponement were also found to be in association with enhancement of competitive advantage and improved organizational performance (Li et al, 2006).

Of all these factors, strategic supplier relationship and alliance seems to be a dominant factor. Though both relational commitment and trust of supplier have positive effects on relational stability in supply chain alliance, which in turn positively affects the alliance performance (Yang et al, 2008), the use of an alliance approach did not lead

to any appreciable improvement in status and respect for supply management's role in developing corporate strategy (Stuart, 1997).

Other than the wider concept of supplier alliance, several strategies have been adopted and found to be effective in improving supplier relationship and hence supply chain performance. Strategic purchasing, for example, was found to be associated with supplier evaluation systems, buyer-supplier relationships and firm's financial performance (Carr & Pearson, 1999). The same study indicated that supplier evaluation systems also improve buyer-supplier relationships and that buyer-supplier relationships associated to firm's financial performance.

A contingency approach in dealing with suppliers is required to ensure the most effective supplier-customer relationship. Olsen and Ellram (1997) proposed a three-step portfolio model to assist in managing different kinds of supplier relationships: (1) analysis of the company's purchases, (2) analyze the supplier relationships, and (3) develop action plans. This relationship could also be analysed from the perspectives of economic importance of the supplier, the continuity of the relationship and the sourcing strategy of the buying firm, which they argued, would improve performance (Gadde & Snehota, 2000).

The increasing improvement on supplier-customer relationship leads to increasing empowerment of suppliers with information systems and technologies as enabler. Use of information technology (IT) leads to strengthening of buyer-supplier relationships (Bakos and Brynjolfsson 1993). Subramani (2004), for example, found that patterns of information technology use are significant determinants of relationship-specific investments in business processes and domain expertise provides a finer-grained explanation of the logic of IT-enabled electronic integration.

From IS/IT standpoint, supply chain collaboration refers to the linkages between different systems that enable transacting parties to perform inter-organizational processes seamlessly. IS/IT often plays the roles as both supporter and enabler to this collaboration (Kumar & van Dissel, 1996). Inter-organizational systems have been classified into different typologies such as: Operational Cooperation, Resource Pooling, Operational Coordination, and Complementary Cooperation (Hong, 2002); Pooled Information Resource, Value/Supply Chain, and Networked (Kumar & van

Dissel, 1996); and Hierarchical, Solar, Centreless, and Swingle (Williams, 1997). Another framework developed by McLaren et al. (McLaren et al, 2002), characterized the degree of inter-organizational integration (e.g. tight versus loose) and type of relationship (many-to-many, one-to-many, one-to-one). For instance, “offline trade exchanges” is used in many-to-many relationships where integration is loose, “shared collaborative systems” in one-to-one relationships where integration is tight, while telephone, facsimile, and email in one-to-one relationships where integration is loose.

Co-evolution of supply chain strategy and technology requires a continuous collaboration between different entities within a given supply network. Such collaboration, exemplified by emergent concepts and technologies such as web-based Supplier Portal and Vendor-Managed Inventory, help organizations to achieve lean and agility in their supply chain network. These systems help increase visibility of information within transacting partners and require a high level of trust between these partners. Since most inter-organisational systems are developed by IT vendors, the concepts of visibility and trust must be understood by these vendors and translated into the systems they develop.

The literature has informed much about the role of information systems and technologies in increasing efficiency, effectiveness and agility of inter-organizational collaboration within the supply chains and networks. However, there has been an apparent gap in the role of these systems and technologies in facilitating supplier empowerment. Following this, the research aims to understand and provide insights into the concept of supplier empowerment within the supply chain domain, the role of information systems and technologies in facilitating supplier empowerment, and helping and hindering issues related to supplier empowerment.

### **3.0 Methodology**

The current study involves 18 organizations including OEMs, suppliers, and IT vendors representing the automotive (5 companies), aerospace (6 companies), electronics (2 companies), healthcare (1 company) and fast moving consumer goods industries (4 companies) and operating in Europe (15 companies), US (2 companies) and Asia (1 company). The research was carried out based on the interpretive tradition through the field study method. The main instruments used to gather evidence were

interviews. Interviews, according to Burgess (1982, p.107), give the “opportunity for the researcher to probe deeply to uncover new clues, to open up new dimensions of a problem and to secure vivid, accurate inclusive accounts that are based on personal experience”. The criteria for selecting the interviewees include: their role in IS and the supply chain, their knowledge about IS and the supply chain, and their willingness to participate in the research. The interviewees were selected among the responsible managers within IT and the supply chain with a total number of 40 interviewees.

36 interviews were done face-to-face and 3 through telephone. The interview questions consist of a combination of open-ended and semi-structured questions, though a large number of the questions were semi-structured. The open-ended questions were used primarily for exploratory purposes such as when discussing the definition and measurement of agility as well as issues and problems faced by the interviewees in relation to supply chain management. The semi-structured questions were mainly used to obtain responses that could describe, rate and explain the dimensions and constructs that are important in understanding this topic. With prior permission from the interviewees, all interviews were tape recorded. The interview tapes were transcribed into texts and imported into QSR NVivo (Richards, 2002). The software was used to store and edit the data, to build and use a coding system, to build a model based on concepts and to analyze the data.

Analysis was performed using thematic content analysis which identifies the dimensions or issues that were most frequently cited and heavily stressed by the interviewees. Weber (1990, p.9) defined content analysis as “a research methodology that utilizes a set of procedures to make valid inferences from text” and Patton (1990, p.391) defined it as “the process of identifying, coding, and categorizing the primary patterns in the data”. Using QSR NVivo, words and phrases that could be attached to a particular topic, theme, or code were retrieved, brought together, and displayed in a tabular format.

#### **4.0 Analysis of Findings**

The study explores the topic with the aim to understand the concept of supplier empowerment from the perspective of practitioners and the use of information systems and technologies for empowering suppliers.

#### 4.1 Empowering suppliers

Empowering suppliers seems to be a major effort in supply chain management for the companies we studied. This stems from the companies perceiving that it is getting increasingly challenging to manage the complexities in the upstream or inbound compared with downstream or outbound market. For the downstream market, concepts and strategies such as conditioning demand and postponement have been introduced and well implemented in many of these companies. However, for the upstream market, since there are more layers or tiers that add values to the products being supplied, strategies become more difficult to be shared, implemented and realised. And, of course, the complexity in the outbound market adds to the complexity in the inbound market since they are very much interrelated.

Though it is a common knowledge that external environment causes complexities in the upstream market, complexities could also derive from internal decisions. Many of the interviewees refer this as “self-inflicted”. Opening of new factories or warehouses, for example, leads to quite a change in the network and lead-times causing difficulties in making reliable forecast. Adoption of variety of business models for different types of business and customers requires efforts to unify in terms of automating business processes which was proven difficult to accomplish. Setting profit forecast profit forecast based on wholesale ambition would results in organizations forcing the wholesale to meet the profit forecast. According to one of our interviewees, *“Does our planning process change a lot because of external factors such as market change? Not significantly. Is our supply changing because of internally driven factors? Yes it is, because we’re constantly remodeling our manufacturing and warehousing environments and looking at new suppliers and ways of rationalizing our supplier base. When you’re changing these things internally, i.e. within your own walls, you’re creating change that is complex to manage”*.

The concept of supplier empowerment involves imparting more powers to suppliers to manage the upstream activities. These, among others, may include shared-planning, allowing suppliers to access information about requirements and procurements and to trigger supply of goods and services without consulting the receiving companies. According to one of the interviewees, *“What I talked about very passionately is understanding the supply chains so that we have a high reliance ... I am trying to*

*improve the way we communicate with our suppliers in terms of giving them a signal of the material that we require and getting them to plan around that.” Empowering suppliers has been conceptualised by one of the interviewees as “that encapsulates the fact that they are giving us the responsibility and the ownership to make sure that part of their system works correctly, that process works correctly”.*

To a certain extent, some companies we studied are gradually outsourcing their distribution centres to ensure that they could stay focussed on other more strategic activities and those activities they do best. These companies believe that with managing supplies is greatly taken off of their shoulders they can now focus more on managing their core business activities as well as in serving their customers.

#### **4.2 Use of Information Systems and Technologies**

Empowering suppliers through information systems and technologies include use of systems and technologies in order to allow suppliers to pre-empt how they could serve their customers better in order to help reduce uncertainties in the supply processes.

To a lesser extent, many companies we studied use web-based supplier portal, for example, to have access to customer’s applications and databases. Several advantages of using portals were captured during the interviews. Most important of all is the portal as a one-stop-centre for supplier-related applications. With single exit and one user ID, suppliers have overview of all the information need to serve their various customers. With information about requirements and parts required, exchange of information could be done speedily online.

A more extensive example of information systems and technologies used to exemplify enhancement of supplier empowerment is Vendor-Managed Inventory. Several advantages of use of VMI were also captured during the interviews. With responsibility to fulfil requirements given to the suppliers, there will be less order-related work on both sides, the customers could be better assured that stocks are on a good level where there is not too much stock or too less stock. Consequently, this type of arrangement improves efficiency and speed. VMI is arguably the best example of visibility of inter-organisational data within a supply network.



### 4.3 Helping and Hindering Factors

Several factors were identified during the interviews why use of information systems and technologies may help in enhancing supplier empowerment. These factors mainly relate to readiness to share information between transacting parties. In order to allow suppliers to serve their customers better, there is a need to allow suppliers to access information about production planning, detail products needed, when, where, etc.

Supplier empowerment could be analogised as a passing a relay baton. It requires a high degree of trust by the receiving partner upon the delivering partner. Companies would only be willing to do this if they have sufficient level of trust in their suppliers. Such trust would allow readiness on the receiving partner to share information about production planning as well as material requirements to their suppliers. As mentioned by one of the suppliers we interviewed, *“I think the phrase that I’ve used 1,000 times when we first implemented VMI is that they say we’re giving you the keys to our warehouse. And I think that encapsulates that fact that they are giving you the responsibility and the ownership to make sure that part of their system works correctly, that process works correctly.”*

Allowing transparency of information is probably the key enabling factor in allowing enhancement of supplier empowerment. However, the main challenge in achieving this is the readiness of the supply partners to water down their influence on the network to other parties. Several IT vendors we interviewed believe that the ultimate aim for an effective supply network, particularly to OEMs would be to enhance transparency and visibility through the whole value chain down to the tier-n suppliers. However, this may not be the best solution from the perspective of other players in the network. Tier 1, for example, would not want to have that because then the OEMs would have more power in the whole game even more than they already have. According to one of the suppliers we interviewed, *“I’m responsible for my supply chain and I do not want to have the OEM seeing into it. I want to cover my supply chain as my area of responsibility but this is something where the transparency is working a little bit against”*. This is confirmed by an interviewee from an IT Vendor, *“IT could provide transparency in the whole supply chain, but if this is not wanted by*

*the tier 1s, and I think it will never be wanted by them, then IT has no business case here”.*

## **5.0 Summary and Conclusions**

This paper has highlighted the importance of empowering suppliers within a supply network. Based on our study, we argued that the increasing importance of supplier empowerments stems from rising complexities in the upstream market relative to downstream market. We have also demonstrated how complexities could also be self-inflicted as a result of internal factors and decisions. In addressing such complexities companies have attempted to use information systems as tools to empower suppliers. Examples of such systems include supplier portals and vendor-managed inventory that allow visibility and transparency throughout the entire network or at least between dyadic partners. One of the most important factors that would allow effective and strategic use of these systems is the level of trust between partners. However, such visibility would face great impediments to be realised since this means some of the partners within the network would have to let loose their existing control and power over information.

As a conclusion, our study has demonstrated the importance of the concept of supplier empowerment to the companies studied and would continue to be a major emphasis in supply chain management. Since information systems and technologies have repeatedly shown to be critical success factors for managing effective and strategic supply chains and networks, the concept of supplier empowerment should be incorporated in current and future supply chain systems and technologies.

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