International Supply Chain Management: A Walk around the Elephant

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ABSTRACT

International Supply Chain Management (ISCM) has developed rapidly in the last decade but despite a range of operational and descriptive models, there are no theoretical constructs with which to ground ISCM into business theory and practice. This paper proposes some tools with which those theoretical constructs can be developed, beginning with an operational definition of ISCM and a framework for evaluating ISCM at the operational, design and strategic levels. Finally, taking the approach of the Saxe fable of blind men describing the elephant in front of them by describing the part that they can feel, we walk around the elephant of ISCM and describe it from several theoretical vantage points. This paper suggests that knowledge, power and governance have particular relevance for ISCM.

INTRODUCTION

Supply chain management is supposed to connect the participants of a value chain in an efficient network of relationships and transactions that can reduce costs, improve customer service, develop the organisation's knowledge base, increase efficiency within the organisation and create barriers to entry for competing organisations (Fisher and Simchi-Levi, 2001; Simchi-Levi and Simchi-Levi, 2003). Although challenging at the regional or national level, at the international level a new layer of challenges, and opportunities, are added.

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Aside from increased logistical complexity, factors including culture, language, regulatory requirements, customs and disparate tax regimes combine to make ISCM more than just supply chain management (SCM) on a bigger scale (Deloitte 2005; Handfield and Nichols Jr, 2004; Mattsson 2003).

As globalisation changes the international economic landscape (Kumar, 1998), ISCM is becoming increasingly relevant to a broader range of companies: even if a firm is not particularly global, it is increasingly likely to have suppliers, customers or competitors who are. It has been noted that many definitions of globalisation centre on the internationalisation of the value chain, that the supply chain is the operationalisation or embodiment of the value chain and that this link between the relocation of activities and the reorganisation of the firm can be a constructive way in which to examine both (Berger et al., 1999; Lynch et al., 1999). As Mattsson (2003: 416) noted, the '[g]lobalisation of markets and the reorganisation of distribution are mutually dependent processes'.

The nexus of these processes is ISCM, which has been the 'coming thing' for at least a decade (Davenport, 2003) and has been directly linked with the success of globalisation efforts (Peterson et al., 2000).

Despite the high profile of a handful of well-known corporate examples (Benetton, Dell, Wal-Mart) and extensive contributions in relation to the technologies, systems and processes used in ISCM (such as EDI, intranets, ERP, e-business etc.), the theoretical understanding of ISCM has not advanced. A closer look at the coverage in the business press reveals that what seems to be extensive coverage is in fact fairly limited (for example, between 1993 and 2003 *Fortune*, *Forbes*, *Business Week*, *Harvard Business Review* each ran fewer than two dozen articles about SCM in any form) and largely anecdotal (such as profiles of individual firms or broad outlines of what ISCM could do). Operational and technological issues are well covered in production-oriented journals (business and research), but there has been little theoretical exploration in the management and strategic research journals. For example, between 1993 and 2003 the major academic journals published less than a dozen articles on supply chain. Moreover, although there are models for characterising certain aspects of supply chains (i.e. Cigolini et al., 2004; Frohlich and Westbrook, 2001), there are no theoretical constructs or frameworks that place ISCM in the 'wider context' that allows for the necessary links to a more general understanding of ISCM (Mattson, 2003: 424) and a 'coherent' evolution of the discipline (Croom et al., 2000).

This lack of theoretical constructs and frameworks is important for at least two reasons. Firstly, despite the impressive successes of a small number of high-profile firms, the few studies that have been completed suggest that successful adoption of ISCM is in fact rare (Cook and Hagey, 2003; Deloitte, 2003; Poirier and Quinn, 2004; Simchi-Levy and Simchi-Levy, 2003). Understanding the theoretical underpinnings of ISCM may help to identify the nature of the gap between potential and reality, and perhaps point to solutions or alternative approaches.

Secondly, the lack of frameworks ensures that ISCM remains an operational issue, which limits the potential for understanding how ISCM interacts with other management and business phenomenon. Defining the theoretical underpinnings for ISCM is clearly a major undertaking and one that will require both collaborative input and several iterations. It is the purpose of this paper to begin that process through the key elements of definition, identification of relevant theory groups and a structural approach, or framework, for characterising the field in the necessary 'wider context' (Mattson, 2003).

This paper is structured in three sections. In the first section a definition of ISCM is offered. In the second section several structural tools are pulled together into a framework, which is proposed as a tool for the characterisation and evaluation of ISCM at the industry level. In the third section, three theory groups that should be able to contribute to our understanding of ISCM are identified and the links between these theories and ISCM sketched out. The paper concludes with suggestions for further work.

Definition of ISCM

Although (ISCM) has been billed as the 'ultimate core competence' (Fine, 1998: 8), as a term it has not been well defined. Whereas journal articles in both the globalisation and SCM literatures frequently begin with a clarifying definition, articles dealing with various aspects of ISCM generally do not. Most often the word 'global' or 'international' is simply appended onto 'supply chain management', implying that geographic scope is the distinguishing factor between ISCM and SCM.

The term 'supply chain management' first appeared in the management literature in 1982 and described a process focused on releasing traditional channels of unwanted inventory (Cooper et al., 1997). A more recent definition describes a supply chain as a network of entities through which material flows, which can include suppliers, carriers, manufacturing sites, distribution centres, retailers and customers (Lummus et al., 2001). SCM is sometimes viewed as glorified logistics; however, where the emphasis of logistics is on the movement of goods and materials, the emphasis of SCM includes the flow of information between members of the chain (Cooper et al., 1997; Fine, 1998). Increasingly, supply chains are seen as a value creating network that, 'as a whole, are able to create a value greater than the sum of its individual partners' (Overby and Min, 2001: 399). Together, the implication is that there is a larger, evolving context for SCM, but this is not succinctly clarified.

This larger context becomes even more relevant in ISCM. Historically, managers – especially in western markets (Maloni and Benton, 1997) – viewed sharing technology or expertise with customers or suppliers as risky, often leading to the choice of vertical integration as a form of SCM. By owning and controlling each element of the supply chain, firms could obtain the desired efficiency and responsiveness without relying on outside parties (La Londe and Masters, 1994). However, the dramatic growth in global competition in the 1980s forced many organisations to compete, directly or indirectly, on an

international scale. Low-cost, high-quality, reliable products with greater design flexibility (Tan, 2002) were essential components for success in this increasingly global competitive environment. This led to a change in management thinking, as manufacturers began to realise that the potential benefits of strategic and cooperative buyer–supplier relationships could outweigh the risks (Tan, 2002). Thus collaborative or network-oriented firms assign each functional role to the appropriate organisation within an entire international supply chain (ISC). This is both defensive (sharing the risks and resources intrinsic to global competition) and pro-active – delivering superior customer value (Overby and Min, 2001)

Although the issues and challenges of ISCM overlap with those of domestic SCM, they differ in both degree and kind (Deloitte, 2005; Handfield and Nichols Jr, 2004; Mattsson, 2003):

- The competitive arena is bigger, not just geographically, but in terms of the number of potential customers, suppliers and competitors;
- The competitive arena is more complex – multiple regulatory authorities, different legal systems, cultural challenges and a multiplicity of tax regimes.

It has been suggested that globalisation can act as a driver of ISCM (Mattson, 2003; Overby and Min, 2001), yet this larger role has not been defined.

The first use of the term ISCM appeared in 1987 (Houlihan, 1987) to distinguish supply chains that crossed national borders. Overby and Min (2001) postulated that ISCM is in fact a new organisational form that is distinguished from basic international supply chains by the level of interdependence between the trading partners. However, this is effectively conflating two separate issues: interdependent or network trading relationships and management of international supply chains. Interdependence in supply chains has also been referred to as 'integrated' SCM (Cox, 2004), but is only one of the multiple ways with which organisations can simultaneously manage their international supply chains. In the absence of a definition that reflects a holistic approach to ISCM, and drawing on the writings of Fine (1998), Simchi-Levi (Fisher and Simchi-Levi 2001; Simchi-Levi and Simchi-Levi, 2003; Simchi-Levi et al., 2004), Tan (2001; 2002) and Pettigrew (2003b) among others, we suggest the following definition:

> International supply chain management is the global management of the production and delivery of goods or services through explicit, concurrent links between the operational processes, process design structure and the strategic objectives of the participants.

Framework for ISCM

The definition of ISCM alludes to three aspects of ISCM, which can be characterised as operational, design and strategy. Recognising these three aspects of ISCM is particularly important given the historic emphasis on the technologies

and systems through which ISCM is operationalised. To be successful, ISCM needs to be integrated throughout all levels of the organisation (Deloitte, 2003; Deloitte, 2005; Fine, 1998; Simchi-Levi and Simchi-Levi, 2003).

Of course, the operational aspects of ISCM are crucial. Operations includes the operational structures of the firm, paralleling the structures side of Fenton and Pettigrew's (2000) organisation design model. It also includes production, aligning it with what Fine (1998: 202) refers to as 'product competence ... (being) ... sure that the final product works and performs adequately'. Finally, it includes any planned activity that is intrinsic to the functioning of the organisation, which is consistent with the management level of Denison's value-chain process model (Denison, 1997). In practical terms, it covers the daily operations of the organisation, including inventory management, production, planning and scheduling, as well as improved manufacturing methods (Huan et al., 2004).

The second aspect is design, which seeks to design a supply chain that will balance and optimise the organisation's strategic objectives with its operating realities. Thus, design includes the processes used by the organisation to achieve its goals and reflects '... a provider's execution capabilities and the design of its ... processes' (Fine, 1998: 203). Fenton and Pettigrew (2000) also emphasise the importance of process in shaping the structures of the organisation. Denison (1997) notes that the design of the value chain – the processes – is the manifestation of the organisation's strategy. The design aspect of ISCM overlaps with, and can be difficult to isolate from, the operational and strategic aspects.

The third aspect, strategy, is the overall planning used by an organisation to identify and reach its objectives and thus addresses the most fundamental aspects of a firm: who it is and what it does. Importantly, there are '... strategic constants, that is principles of strategy that have remained valid *throughout technological change*' (Carroll, 2002). Strategy encompasses the notion of boundaries (Fenton and Pettigrew, 2000), as well as Fine (1998) and Denison's (1997) concept of supply/value chain design and management as the core competence of the firm.

Figure 10.1 summarises and synthesises the relationships between the above models and aspects of ISCM.

In addition to aligning with the Pettigrew and Fenton (2000), Fine (1998) and Denison (1997) models, this framework also aligns with the levels of fit between supply chain and strategic management (Cavinato, 1999). As a further development, Figure 10.2 summarises the operational, design and strategic aspects of ISCM.

Together these aspects of ISCM offer a practical framework through which the nature of ISCM can be characterised.

Theoretical Constructs and ISCM

As has been noted, there has been little work exploring the theoretical foundations of ISCM and what work has been done has largely been confined to

Figure 10.1: Synthesis of Comparative Models and Aspects of ISCM

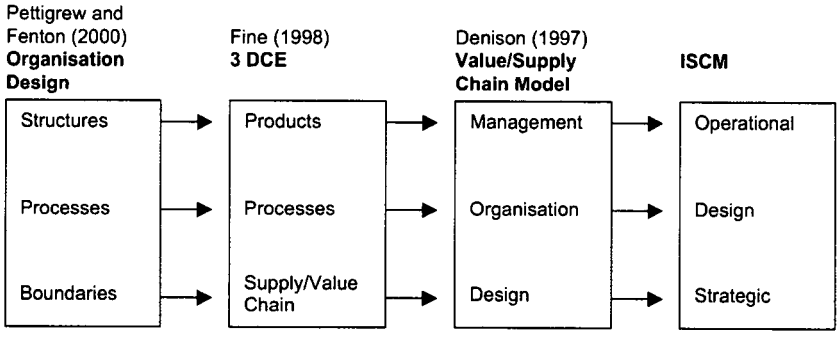

Figure 10.2: Summary of Critical Aspects of ISCM

Operational
The implementation of the integration of information, material and financial flows.
Design
The design of the processes involved in creating the good or service - from development to final destination - in order to balance strategic objectives with operating realities.
Strategic
The identification of the overarching objectives of the organisation, reflecting both the dynamics of the organisation's supply chain and the industry supply chain as a whole.

the operations and production area (Hult, 2004). Given the very limited extant work, a decision was made to approach the subject from the broadest possible perspective, so as not to overlook or prematurely exclude theories that might have something significant to contribute. Thus, this initial theoretical evaluation took the approach of the Saxe fable, in which several blind men try to understand the beast in front of them by describing the part that they can feel. By walking around the elephant of ISCM and describing it from several theoretical vantage points, the objective was to discern the most relevant theoretical constructs for understanding ISCM. A team of experts in the area with particular expertise in ISCM, globalisation and international business identified a list of twenty major theory groups; each theory was reviewed for possible applicability to ISCM. This list was then reduced and refined through an iterative, discursive process until the team felt that it had reached an irreducible minimum. In the end there were three theory groups that the team felt reflected essential aspects of ISCM: knowledge, power and governance. The links between each of these theory groups and ISCM are sketched out below.

Knowledge

It has been noted that the global competitive environment has led to 'inputs' becoming 'ubiquities', i.e. many of the traditional sources of competitive

advantage in international business (such as proximity to markets, organisational design, and sales and marketing strategies) are no longer unique; they are widely available at essentially similar costs and thus ubiquitous (Maskell, 2001). However, an organisation's ability to create and leverage knowledge remains unique. In knowledge-based theory (KBT) an organisation's strength is based on its ability to create, store and apply knowledge; knowledge is seen as the organisation's most important resource (Grant, 1999; Grant and Baden-Fuller, 1995). It is taken for granted that knowledge is increasingly distributed and that knowledge workers are increasingly important in terms of value added (Foss, 2002a). Knowledge-based theory has been so persuasive that contingency theorists have characterised knowledge – both tacit and explicit – as a contingency variable (Birkinshaw et al., 2002).

The central challenge for the organisation is to know what information it has, where that information is and what information it needs. There is an element of resource dependency here: without the necessary knowledge the organisation cannot successfully compete. There is also an element of transaction costs theory, as there are costs to identifying, finding, accessing and using knowledge.

KBT brings many useful concepts to the understanding of ISCM. If an organisation can create value through knowledge transfers with customers or suppliers, the linear value chain is fundamentally changed, becoming more like the ISCM model (Sveiby, 2000). This value chain can lower the costs of transferring tacit knowledge and problem-solving abilities (Heiman and Nickerson, 2002). The benefit of greater access to knowledge at a lower cost helps to explain why organisations might pursue ISCM. Moreover, shared knowledge may be less expensive, but it is no less valuable or powerful. Whereas the old saying was 'knowledge is power', the newer version could be 'shared knowledge is power'. ISCM may be operationalised through technology but it is knowledge, and the application of that knowledge across the supply chain, that holds it all together.

It has been noted that efforts to apply knowledge theory as a tool can be too linear and limited and that '[i]n the future, "knowledge theory" will be quite simply and directly about the state of knowing. It will have less and less to do with control, systems, production, processes, mechanics or methodologies' (Maloney, 2000). This parallels evolving thinking about ISCM, traditionally seen in terms of controls and processes, but as it evolves it is becoming more conceptual and strategic. Another limitation of knowledge theory with respect to ISCM is that KBT typically recognises the role of the external environment only through the relationships with other stakeholders in the value/supply chain, not necessarily in terms of the larger competitive environment; no predictive or explanatory theories are provided.

Power

The balance of power within a competitive environment underpins most aspects of an organisation's operations. The balance of power can tilt in favour

of the customer or the producer and is not immutable (Gereffi, 2001). One force that is changing power balances is communication technologies and systems (such as the internet, EDI, intranets, etc.), which can deconstruct both producer-driven and buyer-driven global commodity chains through their ability to create efficient markets on a scale not previously possible (Sullivan, 2004). Another force is the blurring of organisational boundaries, through inter-organisational relationships, which can shift the location or distribution of power (Pettigrew, 2003a).

The question of power balance has been specifically linked to ISCM through the concept of global commodity chains (Gereffi, 2001). This model places any given supply chain on a continuum between producer driven and customer driven, and facilitates the tracking of movement or change in the power balance. Interestingly, however, power in an ISC is not necessarily in the hands of the biggest, or market dominant, participant in the chain. The chain may be driven by an organisation that has more of a vision or stronger leadership, thus based more on personal influence rather than financial or market power (Simchi-Levi et al., 2004). Nonetheless, whatever the source of power, the presence of a driver firm has been shown to lead to faster development and adoption of supply chain initiatives (Simchi-Levy and Simchi-Levy, 2003).

One way of keeping power balanced through ISC inter-organisational relationships is by ensuring that none of the participants is excessively dependent on another (for example, by limiting the relative share of business between them), which also has the benefit of maintaining the flow of new ideas from other sources (Landry, 1998). Regulators and/or market forces can – and often do – correct power imbalances. Importantly for ISCM, however, power balances can also lead to problems: when the relationship between two or more organisations is such that they operate in mutual self-interest, that self-interest can lead (or appear to lead) to collusion, price-fixing, anti-competitive practices etc. These can be corrected, but it is a critical challenge for ISCM that the inter-organisational relationships that are a central part of an effective ISC can also become, or be seen as, anti-competitive. Supply chain partners rely on trust rather than power and they operate more as networks than hierarchies (Overby and Min, 2001). Managing the balance between constructive but not anti-competitive trust relationships is a central challenge for ISCM.

Governance

According to the Oxford English Dictionary (OED, 2004) governance, as it is used in this paper and in its broadest sense, is 'the action or manner of governing'. In practice, it encompasses the field of organisation design and how organisations structure their internal and external processes. In theoretical terms, that includes structural issues such as 'market versus hierarchy' decisions and inter-organisational relationships, process issues such as transaction cost analysis, and resource dependency. It also draws to some extent on each of the theory groups examined so far: organisational structure and processes materi-

ally affect the ability of the organisation to find, create and use knowledge; and balance of power issues are intrinsic to the decisions an organisation makes about its structure and external trading relationships.

In the hypercompetitive global environment ISCM can play a key role in shaping the organisation's ability to compete. Effective ISCM requires extensive, flexible and responsive control and coordination mechanisms. These can be internalised through a hierarchy within the firm, externalised through the marketplace or 'allied' through inter-organisational relationships (Landry, 1998). Although supply chain management is most often discussed in externalised contexts, supply chains work within any degree of formal operating structure (military organisations, for example, have historically been at the forefront of supply chain development). In highly vertically integrated organisations and industries, most ISCM issues will be internal (which may be affected by internal power asymmetry). However, even these industries eventually have to reach the market and at this point the question of power becomes relevant, as the organisation will have to establish its power relative to its distribution system and customer base. If the balance of power shifts from producer to buyer, the supply chain – and hence the organisational structure – may also have to change.

For organisations in which ISCM is externalised, there are challenges both 'up' and 'down' the supply chain ('up' referring to the providers of inputs; 'down' referring to closer to the end user or marketplace). 'Up' the chain there is potential for conflicts between partner requirements and the organisation's requirements. 'Down' the chain the organisation must balance central conflict between the requirements of a 'physically efficient' supply chain with those of a 'market responsive' supply chain. These efforts have implications for areas as diverse as production, product design, marketing, strategy, outsourcing, inter-organisational relationships and the organisational structure of the firm (Fisher and Simchi-Levi, 2001). It has been observed that the more interdependent the participants in a supply chain become, the more isomorphic their organisational structures will become (DiMaggio and Powell, 1983).

ISCM and Knowledge, Power and Governance

It has been argued that due to the 'information age', globalisation and the development of the knowledge economy, new forms of organisational design are necessary. The move to flatter hierarchies and away from vertical integration, the increasingly interactive nature of market relationships and the blurring of industry divisions have been in process for a number of years (Fenton and Pettigrew, 2000). More specifically, control mechanisms and organisational structures are changing as the importance of managing the complex, distributed knowledge that is now seen as the core asset of the firm is recognised (Foss, 2002b). Each of these themes draws on a resource-perspective and marks a shift towards non-market, non-hierarchical relationships (Fenton and Pettigrew, 2000; Powell, 1990). Where minimising transaction costs was once seen as the primary motivation for the firm, a larger context is now inferred,

including the value of relationships. It has been pointed out, for example, that organisations may make choices that are sub-optimal in the short run because of the greater long-term value of the customer or partner relationship (Axinn and Matthyssens, 2002).

Within the 'new organisational forms' authors generally view the boundary between hierarchies and markets as blurring on both sides, as both take on elements of the other, but another view is that they are simply using coordination mechanisms between firms that were traditionally used within firms (Foss, 2002b). This would suggest that instead of, or in addition to, new forms of organising, new forms of managing transactions and interactions within and between firms are needed. Similarly, Fenton and Pettigrew (2000) concluded that it is not so much the structural characteristics of organisation design that have changed as the internal workings and the experience of the people working within the organisation. That is, the essence of the M-form is intact, but the governance structures within that framework and the connections within and between organisations are both better understood and evolving (Fenton and Pettigrew, 2000).

Ernst and Kim (2002: 1427) take that view further and argue that these converging trends have fundamentally changed organisations from multinationals that '... exploit labor cost differentials' to global network flagships that '... integrate their dispersed supply, knowledge, and customer bases into global (or regional) production networks'. Although these structures are seen in organisational design terms as networks, they can also be seen as ISCs.

ISCM requires that the organisation structure itself in such a way that information, material and financial flows are efficiently integrated into the operational units of the supply chain, whether those units are internal or external (Fisher and Simchi-Levi, 2001). This correlates directly with KBT relating to the value of the transfer of knowledge. In ISCM there is a clear value to lowering the costs of transferring tacit knowledge and problem solving (Heiman and Nickerson, 2002). Inter-organisational relationships are particularly well suited to the integration and transfer of knowledge in support of supply chains, especially when the necessary knowledge cannot be embedded within the product (Grant, 1999; Grant and Baden-Fuller, 1995).

The power aspects of these flows are clear, but it is also important to note that trust is a key to their success. In identifying success factors for inter-organisational relationships, the number of factors that are *de facto* trust builders is notable. For example, one such list cites four key factors: power balancing, co-specialisation (the parties develop mutually dependent connections), target costing (the parties cooperate on setting pricing) and personal ties (Landry, 1998). The last three factors are trust oriented. Ultimately, successful ISCM relies on trust. As was noted nearly forty years ago, '[n]o matter how crucial a capacity or activity, the organization need not attempt to incorporate it if the organization can be certain of its availability, when needed, on reasonable terms' (Thompson, 1967: 66).

Future Research

Testing the framework within globally operating industries will further refine and define it, enhancing its potential as a tool for characterising ISCM. Similarly, the theory groups examined in the 'walk around the elephant' need to be applied to practice, for evaluation as tools for understanding the nature and evolution of ISCM. There are a number of hypotheses that can then be tested, including the following.

Firstly, it could be hypothesised that the more strategic the use of ISCM within an industry, the more evidence of knowledge transfers between organisations within the industry there should be. A possible proxy for estimating the level of knowledge sharing within an industry is the relative occurrence of clusters or networks, i.e. the more prevalent clustering or networking is within the industry, the more prevalent the strategic use of ISCM.

Secondly, the balance of power and/or the levels of trust within an industry may indicate the level of strategic ISCM within that industry. It would seem reasonable that a relatively even balance of power within an industry would correlate with a higher level of ISCM adoption and/greater presence of ISCM at the strategic level within that industry, but empirical research would be needed to establish a causal relationship.

An interesting question is whether the reverse is true: that power imbalances correlate with high levels of ISCM. The example of Wal-Mart, which requires suppliers to use their ISCM system, is often cited. However, this may prove to be an illustration of how important it is to differentiate between a powerhouse within an industry and the industry as a whole. Wal-Mart, with $256 billion in annual sales, may dominate its supply chain but it represents only 8 per cent of the US retail market (*Economist*, 2004); and despite being the largest grocery chain in the US, its share of the grocery market is just 15 per cent (Tatge, 2003).

Finally, aspects of governance should correlate well with the level of ISCM within an organisation. This can be tested against contrasting industries and how they have changed over time as ISCM evolves within each industry.

Although there is clearly a substantial amount of work to be done to embed ISCM within a useful theoretical construct, this paper offers a useful beginning. Providing a working definition and a mechanism for evaluating ISCM will help future researchers both by providing a structure for the work itself and a common platform so that findings can be compared meaningfully. On the theoretical front, it is clear from this work that knowledge, power and governance all have an important role in understanding ISCM. Through a combination of application, investigation and theoretical analysis we hope, as researchers, to better understand the dynamics of this underdeveloped field, one that is increasingly a central component of international business.

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