Information Technology and the Internationalization of the Firm

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Abstract

A key concern for all multinationals is where to find a suitable location for their business activities, bearing in mind that they must find the right balance between global integration and local responsiveness. This article contributes to the internationalization debate by asking: in what sense will information technology enable globalization? We focus on the sourcing process, an area where globalization is often claimed to be the case. Re-examination of empirical evidence shows that global sourcing is not as generally predominant as is claimed. Consequently inhibitors to global integration exist and we classify these inhibitors into three categories: geographical, relational and environmental inhibitors. We then analyze the role information technology plays in reducing these inhibitors and formulate propositions that are then illustrated in two case studies. Information technology is proposed to reduce the geographical and relational inhibitors, but it will have no effect on environmental inhibitors. However, the latter category of inhibitors will become more prominent in future. Information technology thus shifts the balance towards global integration, but simultaneously creates new problems in managing internationalization.

New information technology is widely seen as one of the key triggers governing the globalization of firms. The growth of the Internet has spurred global start-ups and the ability to act as if the world were borderless, so it is claimed. However, in reality most firms still operate in local environments with local partners (Rangan, 2000). While we do not question that IT potentially, and actually, influences the process of internationalization of the firm, we aim to refine this thesis beyond the simple notion that IT stimulates internationalization. We therefore focus on the underlying mechanisms that influence internationalization and analyze IT's role in those. Global sourcing strategy has been chosen as the testing ground.

It has been suggested that firms ought to search globally for the best possible source available (Quinn & Hilmer, 1994), yet not all sourcing is global. One reason may be that the overall business strategy is only compatible with a local sourcing strategy. Another reason may be that even though a global sourcing strategy is compatible with the overall business strategy, such a sourcing strategy is not feasible due to the presence of inhibitors to globalization. Thus it is important to note that a sourcing strategy does not exist in a vacuum, but rather is shaped in part by the overall business strategy. The overall business strategy, such as cost leadership or product differentiation, puts boundaries on the set of feasible sourcing strategies. The business strategy, however, is a higher level of analysis than the one we pursue in this article. Our level of analysis is the sourcing strategy level and in particular the international aspects. The key question addressed in this article is how information technology helps to overcome these inhibitors to global sourcing.

This article starts by highlighting two different views on internationalization, one focusing on global integration and one focusing on local responsiveness. These two views are reflected in the literature on international sourcing as well. Some authors speak of global sourcing as a desirable strategy (e.g. Kotabe, 1992) while others stress the advantages of local networks (Nishiguchi, 1994). In the next paragraph, we review the empirical evidence from the literature and find that it reflects these two views, i.e. there is a balance between pressures to focus on global integration and pressures to enhance local responsiveness. We identify three categories of factors that determine this balance: geographical, relational and environmental factors. We then go on to analyze the role that information technology plays in changing these factors and illustrate our propositions with two firm examples. Finally, the conclusions will expand upon some of the managerial demands imposed by increased globalization.

Location paradox

Two perspectives can be distinguished throughout the literature on internationalization of the firm, which disagree about the importance of location. One perspective posits the convergence of business models and the global integration of firms around the world, which, following Prahalad and Doz (1987), we will refer to as *the global integration view*. The other perspective is far more skeptical about the extent to which firms are heading towards one business model and denies that the global integration of firms is indeed the only, or dominant, model. Instead it points to the importance of localized networks of production and supply and we will refer to it as *the local responsiveness view* (Prahalad & Doz, 1987).

The global integration view has gained strong impetus over the last 20 years. Levitt (1983) was one of the first authors to discuss the concept and the consequences of

globalization. Levitt drew upon examples of global brands like Coca Cola to support his argument and went on to suggest that consumer homogeneity would increase over time whilst firm strategy would be adapted to meet this change. Another concept that is used in the globalization view is the borderless world (Ohmae, 1990). Ohmae (1990: 10) claimed that for many firms nationality had already disappeared as a relevant business characteristic by 1990 and that it would soon after disappear for an ever increasing number of firms. Since then, the term globalization has been very pervasive in business magazines as well as academic journals (e.g. Karimi & Konsynski, 1991). Proponents of globalization point to steep decreases in transportation and international communication costs and benefits of scale and spillovers from one country to the other. The evolving liberalization of international trade regimes makes it easier to do business across borders. Furthermore, some of the larger firms have started to coordinate their manufacturing capacity allowing them to move internal supplies from one country to the other if their products are interchangeable.

The local responsiveness view is supported by many authors as well. Rugman (2000) analyzes a host of data on various aspects of globalization and concludes that regional development is a more important process then globalization, so going global is not always possible or beneficial. As firms globalize their activities they lose connections to local actors, while these local connections can be fruitful avenues for achieving innovation or building joint infrastructures (Grabher, 1993). The local responsiveness view can be traced back as far as Marshall's (1919) concept of industrial districts. Marshall maintains that firms can obtain benefits from locating close to one another through scale economies gained from specialized supplies. Transportation costs can be lowered dramatically if a firm and its customer are in each other's proximity and a pooled market for advanced labor develops nearby. Others (e.g. Grabher, 1993) have pointed at the more efficient common use of public resources like universities, knowledge sharing among competing firms in the same area and spillover effects from competition. The local responsiveness view suggests that instead of or at least complementary to an integration of supplies across borders it is possible to build an integrated network of external suppliers within close range (Grabher, 1993).

Whether or not the global integration and local responsiveness views are mutually exclusive is still being debated (Bartlett & Ghoshal, 1989). It is suggested that a corporation that is managed as a transnational (Bartlett & Ghoshal, 1989) tries to achieve both global integration and local responsiveness and if it succeeds, it has in a way overcome the location paradox. A similar point has been made by Porter (1998). However, empirical examination has shown that achieving local responsiveness and global integration simultaneously is an ardent task that may require an innovative deployment of management tools. In this article we will examine the effectiveness of one set of tools namely information technology, as applied in international sourcing strategy.

Sourcing: global, local or both?

Kotabe (1992) suggests that the processes that Levitt (1983) describes on the output side of the firm, are occurring on the input side as well. In this view buyers, drawing from a broad base of suppliers from all around the world, including developing countries, are adopting global sourcing practices. They are integrating their supplies across borders and in doing so are creating a more efficient supply chain. By

combining the best possible sources of supply, which may be located anywhere, firms are able to create world-class products (Quinn & Hilmer, 1994).

Other authors support the local responsiveness view. Uzzi (1997) describes how a predominantly local network of suppliers is operated among owners of knitwear firms in New York and this local network revolves around trust and embedded relations. Nishiguchi (1994) discusses the network of suppliers that Toyota has created in and around Toyota City, which allows Toyota to be very innovative in product development and flexible in its production system. In the local responsiveness view cooperation with suppliers is best achieved if they are not located on the other side of the world and integration is mainly a process of getting to know each other in person. However, it does not suggest there should be no international suppliers, merely that benefits can often be obtained from operating within the confines of a region.

What can existing empirical evidence tell us about global sourcing? Two distinct arguments have been put forward to substantiate the claim of globalization (Bartlett & Ghoshal, 1989): an increase in internationalization of firms' activities and the functional integration of activities across borders. For sourcing to be defined as global, a high degree of internationalization of the supply base is a necessity. As Monczka and Trent (1991b: 8) stated: "A firm is said to have implemented worldwide sourcing strategy if it devotes some significant systematic amount to offshore sourcing". What constitutes a significant amount is debatable however. One might be inclined to use 50% of the total sourcing volume as the cutoff point, with more than 50% being significantly international. This is an arbitrary measure at best, given large differences in country size as well as geographical constraints. Furthermore, what may seem a large percentage of international sourcing, could be a small percentage when compared to competitors in the same industry, so a relative measure would be more appropriate in any case.

The functional integration is also seen as a necessity to distinguish an international activity from a global one. This is demonstrated by another Monczka and Trent quote (1991a: 2): "Global sourcing ..... refers to the integration and coordination of procurement requirements across worldwide business units, looking at common items, processes, technologies and suppliers". Moving from international to global sourcing requires the firm to start integrating sourcing processes in different countries. In order to achieve functional integration across borders, a firm needs to construct some spatial organization of sourcing, in the form of an interrelated sourcing network. We will now discuss previous research results on sourcing along the two dimensions of degree of internationalization of the supply base and functional integration across borders of the sourcing function. The aim of this review is to find out, as far as sourcing is concerned, how multinational corporations balance global integration and local networks.

Internationalization of the supply base

To what extent do firms use international suppliers? The number of empirical studies assessing the degree of internationalization of sourcing is small (Levy & Dunning, 1993) and our own scanning of the ProQuest database led to few additions (see below). Some of these studies are based on data at national level (Wyckoff, 1993), whereas others employ firm-level data (Kotabe, Murray & Javalgi, 1998). Table 1 summarizes the findings of a number of studies that assess the degree of internationalization.

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These data aggregates do not match the high internationalization associated with global sourcing but instead reveal mainly low (0 to 10%) to moderate (10-20%) degrees of internationalization. The single study that provides a longitudinal comparison (Kotabe & Swann, 1994) suggests a considerable increase of internationalization of the supply base over time. The table shows there is no homogeneous, worldwide distribution of sources. Home countries are strongly favored as a source for companies operating within their own borders and for foreign affiliates a mix of host country and home country sourcing is applied. The larger countries by GDP standards (U.S., Japan) seem to rely on domestic sourcing to a larger degree, a result that confirms our intuitions. Min and Galle (1991) demonstrated that firms tend to look first for suppliers in countries with a small cultural distance from the home country. If we compare the outcomes across nations, it appears that Japanese firms in the US use Japan as an important source, much more than European firms in the US use Europe. This supports the notion that Japanese firms abroad primarily rely on their existing network of Japanese suppliers and only start to use local sources if the latter fail to provide (Kenney & Florida, 1995). That European firms to a larger extent source locally is in line with Bartlett and Ghoshal (1989). They predicted that US firms operate on a global basis, Japanese firms try to replicate their existing operations in other regions, and European firms apply a multi-domestic strategy.

Functional integration of sourcing

Functional integration of the sourcing function across borders implies that there are coordinated efforts to find and manage suppliers across multiple countries. Table 2 summarizes some studies that address the extent to which firms integrate these efforts.

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Spatial integration of sourcing can be achieved through a centralized international sourcing department, regional International Purchasing Offices (IPOs) or a globally integrated sourcing network. None of these three seems to be very prominent and it appears that most firms treat their international sourcing operations as an extension of their existing domestic sourcing.

Overview

This review suggests sourcing is not as global as is commonly suggested. Although some inputs of some firms are sourced from remote parts of the world, an international supply base is not the dominant situation. Furthermore, integration across borders has not really taken off. Birou and Fawcett (1993: 37) conclude in their analysis of the extent to which there is such integration:

> "To date, relatively few firms have implemented truly global sourcing strategies; however, study results show that the international sourcing

practices of some firms are directed at obtaining a systemwide competitive advantage".

There are certain firms and industries that actively engage in global sourcing while others refrain from it. For example the electronics industry is particularly advanced in global sourcing (Kenney & Florida, 1995) while machine building is much more oriented towards local networks (Lane & Bachmann, 1996). Obviously the costs and benefits of global sourcing vary greatly per product or service and for instance transporting heavyweight, low value products to the other side of the world cannot lead to competitive outcomes. Similarly it makes little sense to coordinate the supplies of local temporary labor across borders.

What conclusions can be drawn, given that some of the data in this sample are relatively old? The lack of recent data on global sourcing does not seem to be related to the state of global sourcing in practice. However, scholars have shifted their focus from global sourcing as such to the way it can be put into effect, and to the conditions for effective global sourcing (Kotabe, 1998). It seems this shift cannot be interpreted as the total domination of global sourcing over other forms. Although global sourcing has obviously become more important, global sourcing and local sourcing networks continue to co-exist. Perhaps this does not come as a big surprise to many observers, but what is surprising is that scholars have rarely focused on global and local processes simultaneously. Instead of discussing global sourcing with no thought for local networks, we should be asking what balance between global and local sourcing is achieved, how this balance is maintained and what processes are likely to shift this balance over time. This raises an intriguing question: what is it that determines the extent to which firms practice global sourcing?

Three types of inhibitors to global sourcing

Transaction cost economics (Williamson, 1985) has attempted to sketch the costs and benefits of contracting decisions. Williamson distinguishes between two types of costs: those related to production and those related to a transaction. Production costs of most items can differ widely across countries and if only production costs mattered, firms could be expected to use an almost exclusively international supply base, given the likelihood of production cost advantages elsewhere. This is the drive towards global integration (Prahalad & Doz, 1987) that we explained above. But, as Williamson rightly notes, with the decision to set up a contract with a supplier, parties start to incur transaction costs because markets are imperfect. Transaction costs in international transactions are higher; the different locations of the buyer and supplier, unfamiliarity and the need for local responsiveness (Prahalad & Doz, 1987) all add to the transaction costs of international transactions. To be able to determine when to use global sourcing and when to use local networks, we need to determine what the total costs of both options are. We will treat the production costs at different locations as a given amount since they cannot really be changed, at least in the short run. In other words, how can we distinguish international supply decisions from domestics ones in terms of transaction costs? Three categories of transaction cost drivers in the international context will be mentioned, similar to Luostarinen's (1989) geographic, cultural and economic distance. We propose that these categories are inhibitors to global sourcing and they are in principle mutually exclusive. Geography is solely concerned with the question 'from where to where'? The relational aspects are concerned with what happens in the buyer-supplier relation itself. Finally, the environmental aspects are concerned with what happens around the buyer and supplier,

i.e. the context of the buyer-supplier relation. Figure 1 provides an overall view of the three categories.

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The first category is related to *geography* and how it differs between buyer and supplier. Both people and goods are imperfectly mobile, so physical distribution costs are an obvious part of geography-related costs: they are more or less linearly related to distance. Examples are increasing difficulties in logistics and physical supply and the problems of Just-In-Time delivery under a global sourcing policy (Scully & Fawcett, 1994). Other costs that should be included are the coordination costs due to exchanging information over large distances, for example the costs of synchronization of business processes. As Levy (1995) describes, long delivery time may cause a product to lose value or run out of fashion, so coordination problems between the marketing and production or purchasing functions increase with distance. Another case in point is a difference in time zones, which restricts joint work in some cases. In general, the larger the physical distance, the higher the transportation and coordination costs the firm faces in international sourcing.

The second category resides in the *buyer-supplier relation* itself and is concerned with asymmetric information between the two parties. This has been addressed extensively in the economics of information and economic behavior theory. Individuals and organizations are limited in their ability to perceive, receive, store and communicate information. These differences cause known information to be incomplete. This is expressed in a lack of information concerning a supplier's product offerings, variations in quality standards, different business practices and language- or culture-based difficulties in buyer-supplier communication (Min, LaTour & Williams, 1994; Scully & Fawcett, 1994). An example is that frequently, buyers will not have a good overview of all available suppliers worldwide. Similarly, insufficient knowledge of a particular culture may be an obstacle in international communication. Not being able to communicate with a partner efficiently makes the building of relationship harder. It is difficult for mutual trust to develop when partners do not know each other. This leads firms to stay within the confines of their social networks. Thus in many cases firms will not even be exposed to international suppliers, and if they are, they are less likely to choose such a supplier over a local one. Of course, as the buying firm starts internationalizing its manufacturing network through foreign direct investment, these problems may be tempered. Clearly, the more unfamiliar two firms are with one another, the more costly buyer-supplier differences are.

The third and final category consists of *differences in the environments* of the buyer and supplier. Having to get to know these different environments induces all kinds of deliberation costs and this phenomenon is generally referred to as the 'liability of foreignness' (Kostova & Zaheer, 1999). The environment contains both business elements and institutional elements. Business elements, such as competitors, form the competitive environment, and non-market arrangements such as governments and trade unions make up the institutional environment. Political instability, regulatory and political difficulties, nationalistic attitudes, tariff barriers, trade regulations as well as

different ethical standards are elements of the institutional environment that raise the need for local responsiveness (Min et al., 1994; Scully & Fawcett, 1994). Fluctuations in currency exchange rates are a part of the business environment that strongly influences sourcing decisions (Min et al., 1994). How a business system is constituted influences both the sourcing strategy of the firm as well as the location of the firm's suppliers (for Britain and Germany see Lane & Bachmann, 1996). In general, the larger the environmental differences the higher the transaction costs the firm faces in international sourcing. We posit that these three categories play a major part in determining the balance between local and global sourcing. If the strategic importance of the three categories is great (as dictated by the overall business strategy), then the leeway for strategic decision making is seriously constrained, which leads to the first proposition:

> *Proposition 1: The magnitude and importance of geographical, relational and environmental differences determines the feasible range of sourcing strategies in terms of local versus global.*

Firms that face large and important differences when sourcing globally will be pressured to source locally. If these differences are small or not important, firms will be able to opt for a globally integrated supply chain. In the remainder of this article, we take the production cost structure of the sourcing network as a given. Instead we will focus on what happens when the costs associated with differences in location change, since that can cause the range of feasible strategies to shift. The question is in particular what happens when information technology is used to help overcome geographical, relational, and environmental differences?

Ikea and Ford

In order to illustrate these inhibitors two brief case studies will be presented. Both are well-known examples of internationalization, but they have never been used to examine the effects of IT on global sourcing. One concerns Swedish furniture firm Ikea (see also D'Cruz & Rugman, 1993). The other deals with Ford's 40-year old world car project (which received a lot of public attention around 1994). In both cases the emphasis is on increases in global sourcing, IT usage and the types of management problems these firms face.

Ford Motor Company has engaged in multiple efforts to produce a 'world car'. A world car is a single platform that can be sold in different markets all over the globe without major modifications. Earlier attempts in 1960 and 1981 stranded because the two development teams operated independently on both sides of the Atlantic and there was no integration of the sourcing function across the two regions. The third attempt to build a world car (the Ford Mondeo), code name CDW27, was initiated in 1986[1]. Suppliers were involved from 1989 onwards and both the European and North American organizations contributed. Ford's world car sourcing network involved

[1] It is important to note that the case discussed here concerns the development of a car between 1986 and 1993 / 1994. Reports in the business press in late 2000 scrutinized Ford for the failure of its Ford 2000 program. This was an organizational change program started in 1995, which led to an overly centralized organization that failed to pay attention to local demands. While Ford Mondeo was a forerunner to Ford 2000, it is not a part of that program. Thus this article is not concerned with Ford 2000, but with the period preceding it. In fact Ford 2000 appears to be an illustration of a wrong balance between global and local, in particular the lack of functional integration across borders.

mainly suppliers in North America and Europe, although some of these suppliers originate from Japan. Of the total yearly supply volume of $2.5 Billion, 140 Million involves exports from Europe to North America and 260 Million exports from North America to Europe. The North American share in the components of the European version of the Ford Mondeo was somewhere around 15%. This figure used to be in the range of 1-2% for older models.

Ikea has developed single source relations with suppliers in more than 50 nations. In 1991 45% of its supplies came from Scandinavia, 30% from Western Europe, 5% from Eastern Europe and the remaining 10% from the rest of the world. Over the 1990s Ikea's sourcing policy grew more international. In 1999 Ikea sourced 25% from Scandinavia, 50% from the rest of Europe, 20% from East Asia and the remaining 5% from the rest of the world (including North America). The scale of this international supply network has allowed Ikea to achieve lower costs and high quality products. Ikea's competitors are mostly local firms. Ikea operates trading companies in some of the countries that it sources from. For both cases we will illustrate the important role that IT has played to support the internationalization of sourcing activities leading to a number of propositions.

Geographical inhibitors

The first and most obvious inhibitor to global integration for which we shall examine the role of information and communication technology is the geographical location of the buyer and the supplier. As stated, this inhibitor not only includes the costs of physical distribution, but also the costs of coordinating interorganizational business processes over distance. In terms of the two key elements of global sourcing, the former cost category corresponds to the internationalization aspect, whereas the latter corresponds to the functional integration aspect. IT is unlikely to decrease the direct costs of transportation such as fuel and transportation personnel. However, it may be very helpful in decreasing the costs of transportation related information, through electronic documents, tracking of goods or better inventory planning. This implies that total transportation costs decrease with increased usage of IT although these decreases are often marginal. Total transportation costs have always been one of the key inhibitors to internationalization of the supply base.

Functional integration involves a substantial amount of coordination of business processes, and as IT in general reduces coordination costs (Malone, Yates & Benjamin, 1987), significant changes can be expected. For example, US flower importers frequently buy at the Dutch flower auctions. Upon purchase, the flowers are transported immediately to Schiphol airport and put on a plane. When they arrive in the US (especially the East Coast) they can still be sold on the same business day, thus preserving as much of their freshness as possible. One reason for this being feasible, is the availability of EDI-links between the auction and large growers and buyers, thus enabling better coordination of the logistics processes involved. The introduction of the Tele Flower Auction (TFA) in the Dutch flower industry (Van Heck & Ribbers, 1998) described other advantages of IT. The TFA electronic auction system decreased the transaction costs for buyers, because they did not have to physically travel to the auction to inspect the flowers. It also allowed buyers more flexibility in their purchases because of greater market transparency. Consequently, buyers were better able to coordinate their purchasing strategies in dealing with different markets and buyers. Similarly, EDI has greatly facilitated the adoption of continuous replenishment policies (Lee, Clark & Tam, 1999), because the coordination of the logistics processes over

distance is much easier. All of this points to an increase in functional integration enabled by IT.

Ikea uses electronic links to manage its supplies that are dispersed throughout the world. IT helps to trace cargo and helps to make projections of delivery times. Because suppliers deliver orders on time, Ikea can keep up its familiar no frills approach to marketing. Goods come in pre-packed forms according to specification and customers are responsible for their final assembly at home. Since there are no assembly activities there is little need for intermediate storage of goods. In the Ford World Car project outside suppliers also fulfilled a key role. Participating suppliers were chosen through a global search. Ford used a hierarchy of preferences: one shipping point for Europe and the US was the first option, one firm with multiple shipping points the second best option, and multiple firms the worst option. Consequently a global supply chain emerged that was maintained by the rapid exchange of information on designs and deliveries, which was facilitated by Ford's global information system. This approach helped Ford to "rationalize down to the fewest number of suppliers of best-of-class components on a worldwide scale" (Dick Fite, CDW27 supply director). To achieve good integration between Europe and the US, Ford relied more heavily than in the past on IT like video conferencing. John Oldfield, head of the world car program said about the transatlantic video link: "Without video conferencing, the amount of travelling involved and the time differences would make a project like CDW27 near impossible". In sum, both Ikea and Ford used IT to decrease the costs of distance and this allowed them to use more international suppliers and to increase the frequency and quality of communications.

Proposition 2: IT alters the geographical inhibitors to global sourcing, by enabling more internationalization as well as improved functional integration.

Relational inhibitors

The second category of inhibitors deals with the relational inhibitors between buyer and supplier. Following the two elements of our definition of global sourcing, we make a distinction between inhibitors that deal with the internationalization aspect, those related to buyer-supplier relations, and inhibitors to functional integration, those related to the internal management of the entire international network of suppliers. IT reduces the costs associated with the search for, and evaluation of, potential suppliers, especially when buyers and suppliers would not normally link up (Barua, Savindran & Whinston, 1997). The World Wide Web or a dedicated electronic market can serve as means to find, as yet, unknown suppliers. For many international suppliers a web site in another language, such as English, is easy to construct when compared to the effort of building a relationship with a buyer by means of oral communication. Thus, information technology broadens the scope of the sourcing process in the sense that more suppliers are now able to compete for the firm's order and that the pool of suppliers becomes more diverse.

On the functional integration side, there are benefits as well. By using information technology, standardization of communication can be obtained. Many would even argue that this standardization is indispensable. Through the use of standardized communications, problems related to language and business practice differences will, other things being equal, be lessened, as room for misunderstanding will be reduced. Should problems arise, then technologies such as videoconferencing or shared workspaces on an intranet should, again other things being equal, enable

these problems to be solved faster, thus lessening their impact. The ease with which integration across borders can occur will drive many firms towards a more integrated, networked form of organization. This is echoed by Cantwell and Santangelo's (1999) contention that firms that invest heavily in IT are able to manage their international processes more flexibly. Similarly, Pinsonneault and Kraemer (1993) found that when organizational decisions were centralized IT caused further centralization and that a similar effect occurs for decentralization. All of this points to increased functional integration in sourcing through IT.

Ikea has developed routines that allow it to communicate efficiently with suppliers. It uses English as the language to communicate with suppliers and to an increasing extent international business partners share this language. Designs can be exchanged and discussed through electronic links. New technology allows for the visualization of goods. The local trading companies are also mainly steered by electronic links with headquarters. While long distance communication used to be much harder IKEA is now organized globally. Similarly Ford had learned from its earlier experience that integration across borders would be important. To make the global engineering project viable a worldwide communication infrastructure was needed, particularly one that would allow for sufficient communication with external suppliers. Ford invested in networked computers for problem-solving, real-time multi-site simultaneous engineering and information transfer as well as a global inter-company e-mail system. The global scale of production allowed Ford to reduce the number of times certain operations, like calculations, had to be performed. Both Ikea and Ford increased the global scale of operations. By using IT they managed to solve communication problems that existed previously.

Proposition 3: IT alters the relational inhibitors to global sourcing, by enabling more internationalization as well as improved functional integration.

Environmental inhibitors

Earlier it was noted that the internationalization of the supply base is constrained by environmental factors. For foreign firms those environmental factors are usually very 'sticky': it is impossible to change them and difficult to alter them. While we can use IT to communicate the risks of doing business in a particular country, it does not help to lessen these risks. A single firm abroad is usually not big enough or important enough to change policies or politics and even if the exceptional condition arises where a foreign firm can influence trade regulations, this is much more likely to be done by face-to-face contact and negotiations than through electronic links. If the firm cannot bring about any large-scale change in these environmental conditions, then the introduction of IT will not have an impact on the degree of internationalization of the supply base. With regards to global integration of the sourcing function a similar argument can be put forward. Firms are often not in a position to improve the infrastructure arrangements in a particular country and neither can they do much about the extent of currency fluctuations. This means that the environmental pressures towards local or global sourcing are largely fixed and IT does not change these pressures.

In the late 1990s Ikea came under pressure from some non-governmental organizations and the public at large following a Swedish documentary. The documentary revealed that some Ikea suppliers in developing countries, and in particular subcontractors of Ikea suppliers, hosted terrible working conditions and

used child labor. Officially child labor is forbidden but due to strong pressures from Ikea to cut costs the subcontractors of Ikea's suppliers used children aged 14 and below to produce goods. The company stated that it was unaware of such practices and objected to them. Obviously, some other countries are less strict in maintaining their labor policies than Sweden is and Ikea cannot be blamed for that. However, one of the criticisms launched at Ikea was that it was trying to monitor suppliers from a distance, i.e. the Swedish headquarters or national trading companies, and was unable to track what was really happening at shop-floor level. Commentators argued that a global supply base obliges a firm to deal pro-actively with these issues and monitoring from a distance is often not sufficient. Ford was also faced with local forces. Some 90% of the elements of the three cars are identical but certain differences remain due to different supplier processes in the US and Europe, which made it tough to achieve the desired component commonality. Furthermore local conditions and mandates forced a number of changes. Most of the problems arose when Ford had to re-engineer the Mondeo for the North American market and encountered U.S. federal standards and market conditions. Thus both Ford and Ikea were faced with the fact that their local environments posed demands that a completely global system cannot handle. Their responses should come in the form of local responsibilities or product designs. IT seems of little help in achieving such localization.

Proposition 4: IT does not alter the environmental inhibitors to global sourcing, neither the internationalization nor the functional integration.

Earlier we stated that the more the firm sources globally, the more likely it is that it will have to confront pressures towards local responsiveness. Firms that have a highly international supply base, have to deal with multiple environments simultaneously. Functional integration becomes more complex as the organization becomes more international. The usage of IT increases the feasibility of a global sourcing strategy over a local sourcing strategy (propositions 2 and 3). Since using IT does not alter the environmental forces, we can conclude that under similar circumstance higher IT usage implies more global sourcing and thus a higher likelihood of encountering environmental inhibitors to global sourcing. Paradoxically using IT will help the firm to globalize its sourcing, but will simultaneously pose new demands in the form of the need to manage environmental differences.

Over the 1990s Ikea has increasingly globalized its supply base aided by IT tools. When it started sourcing from developing countries Ikea encountered things it did not come across in Sweden or similar countries. It found out that labor practices may differ in developing countries and that getting adjusted to those practices requires more than simply setting some rules. Ford has also significantly internationalized its supply base and production process, particularly over the last ten or so years. Information technology has been a key enabler of internationalization at Ford. The kinds of problems that Ford still encountered were related to trade issues such as local content regulation but especially to national standards and local market conditions. As Ford changed its strategy from avoiding those issues, through localized production and sourcing, to confronting them, through global supplies, it started encountering more of those problems. Ford and Ikea managed to increase their global reach but both found out that this created new and different managerial demands. Using IT helps the multinational firm to solve some problems, but it will create new ones as well.

Proposition 5: The extent of IT usage is positively related to the likelihood of encountering environmental inhibitors to global sourcing.

Conclusions

An examination of multiple empirical studies has revealed that sourcing has so far mainly been uni-regional or bi-regional and not as global as is commonly thought. Neither does the internal organization of sourcing conform well to the global model, which suggests a strong functional integration across borders. In fact, the more appropriate view is to see every sourcing strategy as a balancing act between the local and the global, which is strongly determined by differences between buyer and supplier in three categories: geography, relation and environment. How big the differences between buyer and supplier are, and how important these differences are to the product under consideration, will determine the feasibility of a particular strategy. IT is a useful way to decrease those inhibitors to internationalization of the supply base and functional integration that are related to geography or located within the buyer-suppler relation. However, IT will not influence environmental inhibitors to global sourcing, and especially not the institutional inhibitors in the environment. As the degree of international sourcing increases, firms will actually have to face these inhibitors more often. The case studies of Ikea and Ford confirmed all of these propositions. Learning how to deal with these environmental inhibitors when setting up global electronic sourcing is a key managerial capability. Future research should address how management can develop this capability.

Another issue that should be addressed in future research is how global information systems can be supported by an equally global management structure and culture that includes an integrated sourcing function. Management should not only focus on the opportunities that global integration provides, but be equally concerned about the consequences of local behavior. This may require firms to go further than simply instructing their own employees about desired behaviors. The Ikea case showed that firms that forget to manage beyond the first tier of suppliers are bound to run into trouble at some point. Since ethical and regulatory demands upon foreign firms are usually greater than upon local firms and being multinational severely increases organizational complexity (Kostova & Zaheer, 1999), a wider range of tools has to be developed. From a research perspective it may be interesting to look at the interaction between global information systems and global management practices and how it develops over time.

Another interesting avenue for future research concerns the impact of the Internet on sourcing relations. Ford is working in new ways to improve the information exchange with its suppliers and reduce transaction costs. It participated in ANX, the Automotive Network Exchange and is now collaborating with multiple competitors to build more advanced electronic marketplaces in the Covisint initiative. It is interesting to note that those efforts are still implemented on a region-by-region basis. Starting with the US these systems are slowly expanding to Europe and Asia often in an adapted form. The Internet era raises interesting research questions. Perhaps it is true that the Internet opens up the opportunity to look for the best possible sources in the world but do firms subsequently use that opportunity? Or, alternatively, do they continue to expand on the basis of their existing social networks (Rangan, 2000)? Only empirical testing can resolve that debate but it seems unlikely that local networks will suddenly become unimportant. Thus the question is in what

situations will local networks remain of importance? This article has pointed at the importance of analyzing environmental pressures to answer that question. The local and the global continue their struggle.

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Figure 1: Three categories of inhibitors to internationalization

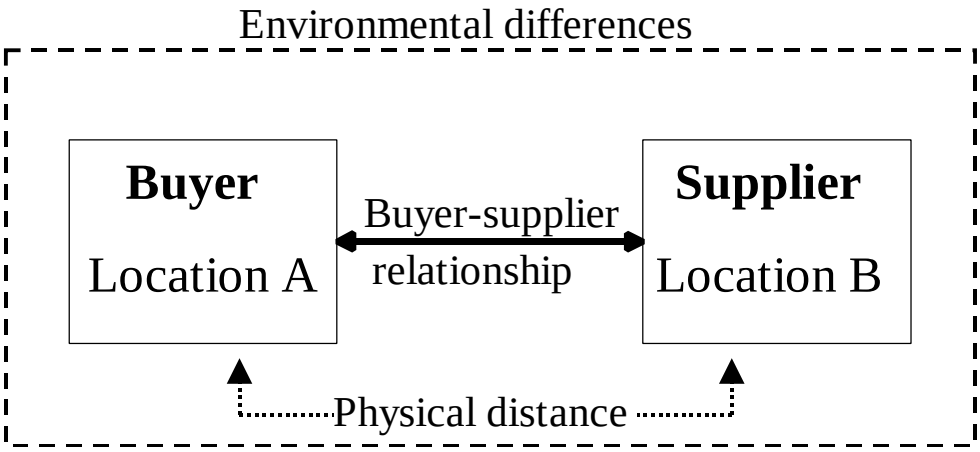

Table 1: Summary of quantitative research findings on the supply base. Home applies when firms originating from country A use a source in country A. Local applies when a firm from country A and producing in country B uses a source in country B. International applies when a firm from country A and producing in country A or B uses a source in country C. All findings have been recalculated into percentages. Note that authors use different ratios.

† Assembly; ‡ Components; # Sourcing of services.

From	Study	Firms and location	**Home**	**Intern.**	**Local**
1	Input-output tables of national economies	US at home	87%	13%	x
		Japanese at home	93%	7%	x
		French at home	62%	38%	x
		German at home	66%	34%	x
		British at home	63%	37%	x
		Canadian at home	50%	50%	x
2	Public data of 2,000 firms with 18,000 affiliates	US at home (1977)	93.8%	6.2%	x
		US at home (1982)	92.2%	7.8%	x
		US at home (1989)	89.7%	10.3%	x
3	Survey of 156 firms	Japanese at home	97.6%	2.4%	x
		French at home	92.0%	8.0%	x
		Swiss at home	8.4%	91.6%	x
		Benelux at home	29.3%	70.7%	x
4	Survey of 43 European and 28 Japanese firms	European in US †	37.2%	14.0%	48.8%
		Japanese in US †	53.6%	3.6%	42.6%
		European in US ‡	46.5%	11.6%	41.9%
		Japanese in US ‡	78.6%	3.6%	17.9%
5	Survey of 43 European and 28 Japanese firms	European and Japanese in US	29.9%	5.8%	64.3%
		European and Japanese at home	88.5%	11.5%	x
6	Survey of 73 European and 21 Japanese firms	European and Japanese in US †	85.7%	6.4%	7.9%
		European and Japanese in US ‡	15.9%	10.3%	73.7%
7	Survey of 149 firms	US at home	87%	13%	x
8	Survey of 40 firms	US at home	85%	15%	x
9	Survey of 100 firms	US at home #	90.2%	9.8%	x

1: Wyckoff 1993
2: Kotabe & Swann 1994
3: Buckley & Pearce 1979
4: Kotabe & Omura 1989
5: Swamidass & Kotabe 1993
6: Murray, Kotabe and Wildt 1995
7: Birou & Fawcett 1993
8: Monczka & Trent 1991b
9: Kotabe et al. 1998

Table 2: Empirical research assessing the degree to which firms have integrated their sourcing function across borders. Where is the international sourcing function located?

Authors	**Sample**	**Findings on mode of sourcing**
Giunipero and Monczka, 1990	Survey of 24 large MNCs from the United States	All 24 operate some corporate purchasing staff Only 8 operate an international purchasing department Others operate on a more decentralized basis
Frear, Metcalf, and Alguire, 1992	Survey of 135 US purchasing managers	66%: user organization (decentralized) 35%: corporate purchasing (centralized) 10%: company-owned trading operation 11%: purchasing department of subsidiaries 8%: purchasing department of JV partners
Min and Galle, 1991	Survey of 141 US purchasing managers engaging in international sourcing	38.1 %: assigned buyer in purchasing unit 34.1%: manufacturer's representative 10.3%: foreign buying office 10.3%: import broker 7.9%: trading company 7.1%: foreign subsidiary 4.8%: import merchant 0.8%: state trading agency
Handfield 1994	Survey of 97 US purchasing managers of which 56 used foreign sources	49.1%: directly between buyer and supplier 41.8%: supplier's US representative 5.5%: external trading company 3.6%: international procurement office 4.1%: face to face 1.9%: automatic order system