COORDINATING SUPPLY CHAINS…INTERFACING PRODUCTION NETWORKS… OR CREATING MARKETS ?
THE CASE OF GLOBAL INTEGRATORS AND SOURCING IN CHINA

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Key words

Market-making; Market-shaping; Global production networks; managerial reach; global integrators

Introduction

Globalisation has been a focal issue in business research in the business community at large worldwide for some decades now. While the great majority of earlier attention was with the supply side of the globalisation of markets, and the internationalisation process seen from a supplier's perspective, recent research has turned attention to the demand-side and the purchasing function, the evolving globalisation of production networks, and the opportunities emerging for international – or as it is often labelled – global sourcing.

The organisation and management of international sourcing activities and production networks have become issues of growing strategic concern.. One reason is the intensified focus on outsourcing per se and the changing framework for organising activities of the enterprise, another is economies of scope, along with the perceived opportunity for cutting costs related to global sourcing in many lines of business. The opportunities inherent in international – or global – sourcing are more often than not related to new and expanding information and communication technology, the growing efficiency of transportation services worldwide and changes in the institutional framework facilitating trade and relation-building. These are indeed important aspects of the infrastructure sustaining global sourcing.

In this paper, however, focus is on another – often ignored – aspect. In the wake of the globalisation of production, complexity of coordination increases, leading to decentralization of coordination tasks, and the parallel shift from one central production and procurement function to several interdependent actors working in production networks. As a consequence, a new type of network actor is emerging, whose activities focus on the linking up and integration of production systems, extending managerial reach by localising and differentiating business systems.

This contribution may be seen as a study expanding past research on evolving patterns of global supply networks. Focus here is with what is traditionally seen as a connecting and co-ordinating role played by what in a previous study has been labelled 'Global Integrators' (see Andersen & Christensen, 2002). Although we concentrate here on the roles played by these 'Global Integrators' the broader objective is to illustrate the fundamental issue of sourcing for inter-organisational innovation in global production networks. We illustrate in particular the different ways in which entrepreneurial actors actually reorganise relational opportunities, thus paving the way for improved sourcing opportunities for numerous actors, which in turn leads to inter-organisational innovations contributing to the restructuring of the "global" production network.
Two in-depth case studies on two SMEs operating as 'Global Integrators'serve to outline and detail the generic role they play in the evolving global production network, whilst at the same time identifying the specificities of each firm's approach. These differences in approach can be observed to have radically different consequences for the way the market itself evolves.

The paper is structured in the following way:

First, our use of the concept of Global Production Networks (GPN) is discussed in light of a critical, but also sympathetic critique of three related, yet disjunctive analytical trajectories proposed in the literature. These are the value-added based Supply Chain Management approach (SCM), the Global Commodity Chain approach (GCC) and the Global Production Network approach as presented in the so-called 'Flagship' model. Based on our thoughts regarding these contributions, we then propose a conceptual framework, which we find offers analytical advantage in relation to our purpose, namely the basic understanding of how new actors build positions in the network, how networks and markets are brought to overlap to a lesser or greater degree, and of how their evolving business is interdependent with the creation of sourcing opportunities for other actors.

In the next section, our view of the evolving global division of labour is shortly sketched in order to combine an abstract macro perspective with the empirical micro level analyses carried out. The idea is to overcome the analytical difficulties i.e. empirical micro-level analyses tend to miss the larger analytical picture on the one hand, and macro- or meso- level analyses of abstraction tend to disregard or restrain appreciative aspects of variety in evolution of the network displaying the overall patterns of division of labour.

In the following section the multitude of organizational options available to the sourcing enterprise is related to the evolution of the GPN. Inspired by the model on firms and markets degree of internationalization proposed by Johansson and Mattsson (1988), major trends in the evolution of GPNs is briefly discussed with

respect to variety, changes in selection mechanisms and factors of retention. Differences in governance logics are discussed, as are issues as relational costs and value creation.
The generic role of Global Integrators is then discussed with respect to their entrepreneurial role in GPNs, their role in what is usually considered as "connecting" business networks that have thus far been disconnected. In light of this the concept of managerial reach is outlined and discussed.

The two case studies are subsequently presented and analysed, as examples of roles played and functions exerted by two different types of Global integrators in the marketplace.
A tentative typology of these actors so far labelled simply as 'Global Integrators' is discussed in order to highlight the variation in the ways relational management is organised, and at the same time highlight generic consequences for market evolution. These analyses are conducted in an activity chain perspective in which task partitioning and activity coordination are at the centre of analyses.

The variation of services offered by 'global integrators' is subsequently analysed from a resource-perspective, relating the resources of the sourcing enterprise to those resources offered by different types of global integrators.

The paper concludes with a model, in which the role of 'Global Integrators' are suggested to be part of a larger pattern of entry and development modes available to enterprises engaging in global sourcing, each with consequences for the way the "global" market itself develops.
We discuss in a final section macro-level implications as well as implications for the sourcing options for small manufacturers. Theoretical perspectives are considered.

The concept of Global Production Networks (GNP)

The evolving patterns and practices in global sourcing lead to the initiation of a number of analytical contributions, which in spite of their differences in approaches and scope have in common an explanatory value promoting our understanding of those basic patterns underlying the dynamics of global production systems but also of markets in general.

The Global Supply Chain Management perspective
In the Supply Chain Management approach the analytical perspective is managerial, and focus is on how the focal enterprise can integrate planning and control of materials and product flows from suppliers to customers (Ellram, 1991).

The Global Supply Chain Management (G-SCM) agenda is closely related to the emergence of transnational corporations and the range of logistical problems these and similar types of international operating corporations experience (Scary and Skjøtt-Larsen, 1995).

This upstream perspective has contributed to our knowledge of how strategies and management of procuring firms reach out and interfere with activities-planning in other related firms, whilst at the same time influencing their strategic options and perspectives. However, the focus taken in G-SCM tends to exclude an understanding of the interactive nature of actors strategies in networks as well as the wider dynamics of relationship building. It is thus vague and indirect as regards in particular the implications of social exchange processes among actors in markets.
However, our basic problem with this SCM model relates to its basic attributes, namely the concept of 'chain management' and the habitual foundation on Porter's (1980) notion of value chains. Problems are related to the way in which the supply chain is portrayed as a manageable system. Gadde and Håkansson (2001), in a critical analysis via a number of illustrative cases, point out some of the key issues in this respect.

The *value chain* notion leads to a view of a closed system of participants involved in the production, marketing and distribution of goods and services. Learning is not sensed as being an interactive process, but rather as being adaptive to the interactive regime set by the focal firm.

The positive contribution from the value chain management perspective comes from the integrated view of activity chains it provides, and the idea of interdependency of tasks along the value chain. While it tends to disregard issues of territorial diversity and tensions inherent of the functional coordination which distinguish global supply chains from international procurement, it does underscore the internal problems faced by large

M-formed organisations in their efforts to coordinate outsourced activities in efficient ways. In this way it does in fact highlight some of those key problems large enterprises face in their efforts to create managerial reach. To sum up, then, two dimensions are worth noting for more consideration in later sections of the paper, namely the problems of reach related to the territorial dimension and problems related to the social exchange dimension.

Global Commodity Chains

Gereffi (1995) is the main exponent of this influential view of global commodity chains (see also Gereffi and Korzeniewicz 1994). He identifies four dimensions of the GCC of importance for analysis (Gereffi 1999). These are: input-output structure; territorial patterns of activities and actors; governance structure determining resource allocation and the distribution of value; and institutional framework i.e. political and regulatory regimes contextualizing the commodity chain and each of the actors in the chain. Based on these dimensions, he then outlines two ideal[1] types of commodity chains:

> *"A commodity chain refers to the whole range of activities involved in the design, production, and marketing of a product....Producer-driven commodity chains* are those in *which large, usually transnational, manufacturers play the central roles in coordinating production networks (including their backward and forward linkages). This is characteristic of capital and technology intensive industries such as automobiles, aircraft, computers, semiconductors, and heavy machinery*. *Buyer-driven commodity* chains*, on the other hand, refer to those industries in which large retailers, marketers, and branded manufacturers play the pivotal roles in setting up decentralized production networks in a variety of exporting countries, typically located in the third world. This pattern of trade led industrialization has become common in labor intensive, consumer goods industries such as garments, footwear, toys, handicrafts, and consumer electronics. Tiered networks of third world contractors that make finished goods for foreign buyers carry out production. Large retailers or marketers that order the goods supply the specifications."* (Gereffi, 2002, page 1)

While the buyer-driven chains may be characterised as driven by manufacturers without production facilities, the producer-driven chains are characterised by the central role played by the corporate production facilities. The GCC approach seems to associate on the one hand the producer-driven commodity chains with Fordist and Neo-Fordist production methods, while on the other hand the buyer-driven chains are much more linked to Post-Fordist ways of organising and managing supply chains. Also, the GCC approach places focus on the role of TNC's (Transnational companies) in the configuration of global production networks.

The analytical progress made with the GCC schema is unquestionably huge, let alone that it allows for the identification of the dynamics of uneven development in territorial as well as a variety of business contexts. No wonder that the GCC stands out as an analytical model for policy initiatives from the ILO[2].

One of the weaknesses the GCC approach shares with the G-SCM approach is the "under-socialised" agenda. The role of social relations is given inadequate consideration, with the consequence that certain path dependencies also remain underexposed.

At the same time the GCC hardly touches those coordination problems TNC's face in their efforts to achieve workable outsourcing strategies and coordinate activities across divisions on a world scale. There is a tendency to view the firms as mere reflections of the commodity chain, in which they participate (Henderson et al., 2001).

A Global Production Network Approach – the Flagship model

The aim of this research agenda is that of explaining an organisational innovation, which the authors find has gone unnoticed in the past (Ernst and Kim, 2002). It is the drift away from the M-formed organisation of the multinational corporation to what is labelled a "global flagship", which organises and integrates their dispersed supply, knowledge base and customers into global production networks.

[1] 'Ideal types' in this context refers to Weber's Ideal types.

[2] ILO sponsored a programme in the 1990s on global commodity chains.

The view is that industrial organisation is changing because of the impact of the forces of globalisation (Ernst, 2002). Thus the focus of analysis needs to shift away from a sole focus on MNC's linking production sites in low cost locations with trade in markets in the OECD area, mainly the US and Europe.

From the Flagship model perspective the competitive success of the flagship depends on its ability to combine the sourcing of specialized capabilities outside the firm with co-specialised assets owned by the firm. Increasing vertical specialization is the fundamental driver of this flagship model of industrial organization (Ernst, 2002). This leads to outsourcing not only of manufacturing activities, but also of a wide range of service and managerial functions. Flagships retain in-house activities in which they have a particular strategic advantage; they outsource those in which they do not. It is found to be important to emphasize the diversity of such outsourcing patterns.

Two types of Flagships are outlined, namely the Brand-leaders and the Contract manufacturers. The last category is seen to configure their own network of suppliers in order to serve the brand leaders.
Contract manufacturers are seen to have grown in importance since the middle of the 1990s. The implication is symbiotic relations between Brand-leaders and Contract manufacturers, involving tight relationship-building as well as battles over leading positions in the supply chain. While contract manufacturers alone demonstrate directly imply new roles for sub-contractors, they also create new opportunities for other subjacent layers of sub-contractors.

At the same time a simplified distinction is made between two main types of supplier: Lead suppliers and lower-tier suppliers. The lead suppliers work as coordinating links between Flagships and their own – usually local - network of lower-tier suppliers.

In their contributions, Ernst and Kim (2002) make a number of valuable points, adding to a renewed understanding of the dynamics of global production networks. They note in particular that past focus on formal R&D and technology transfer precludes a proper appreciation of the role played by more tacit forms of knowledge transfer amongst actors in global production networks.

Although the Flagship scheme has a narrow focus, with global production networks dominated by monolithic actors, a strong link to local communities of small enterprises is established. The role played by industrial districts is thus underlined.

Global Production networks

The three preceding subsections reveal, in fact, three different models, each with their specific vision of how managerial reach in global production systems is created. In the G-SCM scheme this capability is very much aligned with a focal enterprise labelled as an end-producer. In the global commodity chain model it is aligned with two types of TNC enterprises, very much like the Flagship model.

Although we have not outlined the full agenda as it stands in the plethora of available literature, we do find there is an overwhelming tendency to focus on those particular forms of industrial organisation reflecting contemporary configurations which dominate the scene at the time of writing. Conceptualisations and explanations of a more general nature seem to be missing, and not least those relating to those factors contributing to a possible break-up – or eventually consolidation – of established logics and degrees of structuring of the global production network.

Inspired by Dicken (1998) and Henderson et al (2001) we therefore propose an analytical framework, which tries to open up for diverse possible developments which lends itself to future development. As an initial frame of reference, we adopt the definition of global production networks proposed by Dicken et al (2003):

"We define global production networks as the globally organized nexus of interconnected functions and operations through which goods and services are produced and distributed."
(Dicken et al 2003, page 15)

In this conceptualisation of GPNs we find an emphasis on autonomic forces embedded in the network, which on the one hand build on organizing activities by individual actors but also, on the other hand, are beyond control of individual actors. The GPN is thus seen as a cage framing the options of relationship-building, but

also as a space of relational-based business opportunities (Haakansson and Snehota, 1995). These opportunities are often associated with organisational initiatives leaving room for higher degrees of connectivity and new forms of relationship building. In general terms, exploitation of these opportunities by business actors contributes to new waves of opportunities.

A revised view on the changing global division of labour

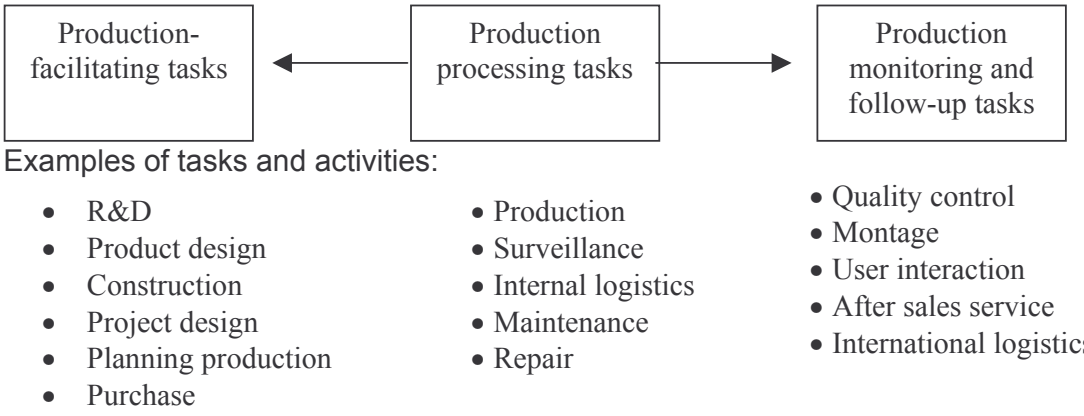
The different theoretical approaches presented in the past sections tend to model the Global Production Network as a highly structured network with a basic logic framed by the way TNCs configure activity chains and their supply network. It leaves the impression of a stable pattern in which only a limited number of resourceful actors are able to overcome the task of configuring activities in the network and thus utilise what might be labelled relational rents (Dicken et al. 2003) from global sourcing.

In this section, our view of the evolving global division of labour is briefly outlined, so as to sketch the basic changes in the way this is facilitated by the global Production Network. In our view these changes in turn constitute a transformation pressure, triggering the evolution of the network.

There is a long tradition of viewing the international division of labour from a horizontal perspective, i.e. between different sectors and groups of products. However, several studies have pointed to the growing vertical division of labour (OECD, 1995) evolving along different activity steps in the value-added chain leading from primary sources to final consumption. Indeed, studies of international trade patterns have shown that trade in semi-manufactured goods and intra-industry trade has growth rates higher than international trade in finished goods and inter-industry trade (Lüthje, 2001).

This pattern can be seen as a trend where the international/global production network evolves at great speed. Manufacturing tasks, which previously were integrated or located at proximity can be separated in space leading to a growing mobility of tasks and activities.

Figure 1. Evolving trends in the division of labour in production.

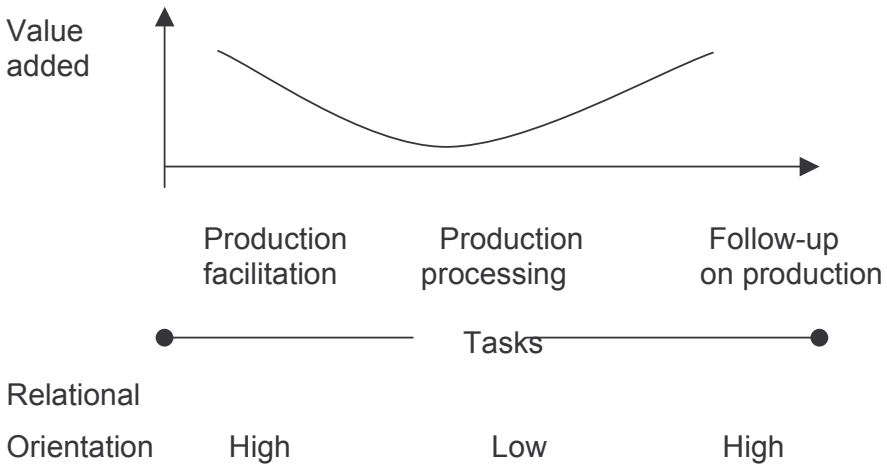


At the same time processing tasks are separated from those tasks of facilitating or preparing for manufacturing on the shop floor, just as follow-up activities can be separated from the manufacturing tasks per se. This trend in the internal division of labour of the single enterprise as well as in the wider production structure is sketched in figure 1 above.

One of the fundamental shifts from international to global production networks is the degree of functional integration and coordination of activities in the network. In this respect information and communication technology play a key role.

While the tasks of carrying out production in general[3] are placed under a general productivity squeeze, leading to automation and outsourcing, production facilitating tasks tend to take on a critical role in the competitive struggle. the of Manufacturing follow-up tasks such as quality control, montage, customer surveillance and marketing also tend to take dominant positions as competitive means, again, at the expense of tasks of manufacturing per se. In the OECD-area at large, the gap is growing between added-value generated via processing, and that generated via an increased awareness of, and relationship-intensive activities relating to, production facilitation and follow-up, as illustrated in the figure below:

Figure 2. Added-value and relational orientation of activities (tasks)



However, perspectives on these trends differ. As the models discussed earlier indicate, large firms, with a well-developed international organisation, have in the past been far better placed to utilize international outsourcing opportunities. Small and medium-sized firms, on the other hand, have in the past been in a much weaker position to do so. This unbalanced opportunity structure leaves small and medium-sized subcontractors, competing with large, international corporations, in a rather tight situation.

This situation relates essentially to the ability to create relational rents through investments in the build up and structuring of the supply network. Over the years this has been done by large corporate enterprises, by way of foreign direct investments in Asia, Eastern Europe and similar locations.

However, the difficult situation confronting a huge number of small and medium-sized manufacturers in Europe, the USA and Canada is also opportunity-generating, since these firms may meet large customers trying to leap-frog competitive pressure by seeking out global sourcing options.

Changes in the international division of labour are also expressed by the growing mobility of production-facilitating tasks, which in turn opens up options for outsourcing. Construction drawings can be mailed long-distance, for example, meaning that the construction engineers can be located miles away from the manufacturer. However, the implication is also that the on-going dialogue between constructors and producers tend to be reduced. This implies that the balance between innovative-oriented interaction and operative routinized interaction changes.

In conclusion, two observations of importance can be made. First, the international division of labour has a tendency to be increasingly refined, implying that more numerous, more-specialised firms are involved on the road from primary sources to final goods. And secondly, that the global production network available for the firm is in the process of becoming more and more difficult to monitor. The Internet alone can hardly help

[3] i.e. in the developed, industrialised economies making up the majority of the OECD

this problem, since the knowledge category called 'know who' includes an important element of tacit knowledge about firms' competence and credibility.

This situation leads to a stronger focus on the role of delegation and external learning processes in interplay with suppliers and thus also a search for new ways of organising in order to support managerial reach and relational cost reductions. This interplay opens up new perspectives in terms of new roles for the communities of sub-suppliers.

Increasing numbers of sub-suppliers are developing administrative and coordination competences, which make them capable of acting as systems-suppliers. Internationally some of these suppliers are seen to develop further into the role as contract producers, taking responsibility for a whole product or product line for leading brandware producers. In other words, a growth in the differentiation of those functions and roles sub-suppliers take on in the international value chain can be observed.

In summary the aggregated changes in the international division of labour goes hand in hand with a stronger functional specialisation in space as well as in the production network. These developments mark the difference between international production networks and global production networks.

Global production networks are thus characterised by three basic dimensions. Firstly, the degree of functional integration of the network. Secondly, integration of the so-called 'triad' of continental production networks into one coherent production network. And, thirdly, the diversification of inter-organisational modes of interaction, reducing relational distance and thus allowing a wide range of firms - and not only those few investing in ownership-based advantages (Dunning, 1988) -to engage in and coordinate dispersed production activities,. At the centre of this evolution is the issue of relational rents (Dicken et al. 2003) as opposed to ownership-based rents.

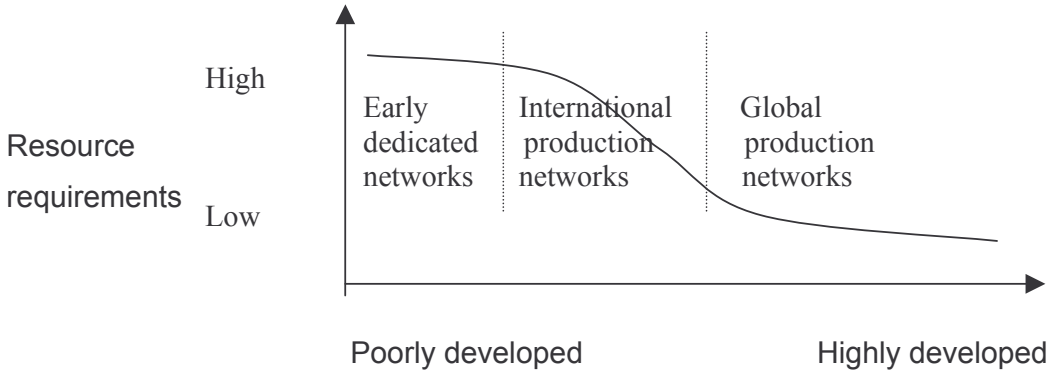
The balance between these is, in our view here, triggered by the emergence of a specific type of firm, capable of grasping the business opportunities related to the creation of managerial reach. These are the types of firm we generically label global integrators in the following sections.

While information and communication technology as well as reduces freight rates and liberalised frames for international trade often are underlined, we find that the role interorganisational innovations play is an ignored dimension in the transformation of GPN.

Organizational options in light of the evolution of the GPN

Based on the changing division of labour and inspired by the model on the degree of internationalization of firms and markets by Johansson and Mattsson (1988), we propose a model combining the international sourcing orientation of firms with different stages of the international production network. The intention is not to develop a fully comprehensive model, but rather to focus on the role of interorganisational innovations leading to new options for the way firms organise their international sourcing.

Figure 3. Stages in the evolution of the GPN – a tentative model



	Network structure		
Actors:	Pioneer sourcers	International sourcers among others	Late sourcers
Network:	Building up	High	Lowering

In poorly developed business networks the number of relational options are few. The cultural and institutional divide is strong, which is supported by a low level of interaction between the national or macro-regional networks. Awareness and knowledge of the business climate and the atmosphere dominating the other network is also weak. Therefore the creation of managerial reach is demanding in terms of risk-taking behaviour. The experienced sourcing firm operating in such poorly developed networks knows from experience in other contexts that requirements for investments are high and the time horizon for relational profits may be distant. The inexperienced sourcing firm most likely finds barriers to sourcing too high and refrains from investments Entrepreneurial sourcing firms seem to dominate these networks..

Each line of business has its own history of international sourcing. Just to mention a few examples, some British conglomerates have a long history based on activities in colonial times (See for example www.bp.com/company_overview/history). In other lines of business international outsourcing of production has only recently emerged. An example in case is the film industry, which, although the history of exchange of actors and directors is long, has until recent decades been national in their production system. While construction engineering has a long record of international sourcing, housing production is much more nationally-oriented in production and sourcing.

One point is that, in the early phase, the international production network is poorly developed for the simple reason that new initiatives and organisational innovations result from the deficiencies discovered though interactive experiences. International sourcing is thus closely associated with foreign direct investment and the internalisation of sourcing activities. As the history of BP demonstrates (see the web site above) pioneering international sourcing may be a costly affair. Resource requirements are high. Experience with international sourcing is low in the firm as well as in the surrounding environment of actors, relational costs are high in building and maintaining relational value. At the same time the institutional framework is weak. These networks are often highly dedicated to the sourcing firm for the simple reason that there are no or few alternatives. This also influences the logic of governance in the supply chain as well as the possible options perceived by actors in and outside the network. Pioneers in sourcing exist even in our times. A well-known example is IKEA.

The research approaches relative to GCC and Global Network Flagships sketched above provide images of the second phase of evolution – the International Production Networks phase. In this phase international outsourcing of production has become part of ordinary business in a huge number of business lines, mainly those dominated by TNCs. However, the variety of organisational options available is expanding. This implies that the logic of governance in supply chains is differentiated. Different modes of organising and coordinating activity chains have developed and so has also the complexity of sourcing. This is partly due to the organisational complexity of the sourcing TNC; partly due to expanding alternatives for sourcing; and partly because outsourcing often expands to such levels that external relationship management overtakes internal management, in strategic as well as operational terms.

In internationalised business networks, in this second phase, barriers to entry have lowered but the integration of networks is still low in a territorial as well as a functional sense of the word. The implication is that local presence is still needed in order to support coordination and secure knowledge exchange and credibility, therefore Foreign Direct Investments (FDI) and the internal organisation of sourcing still prevail. However, the options open as to how to create managerial reach are rising, as more varied ways of organising sourcing increase. International sourcing still requires many resources, but imitative practice along with investments in infrastructure, and change in perceived opportunities seen by actors in the international community, are all factors contributing to the lowering of relational costs.

The balance between internal based operations and out-sourcing is changed. However, two features seem to characterise this phase. International sourcing is still – by and large – restricted to resourceful players, and outsourcing of production tasks are still basically in a divide between the three continents. Trade statistics seem to tell this same story until the middle of the 1990s, from which point on a growing number of anecdotes can be given as examples of exemptions from the rule,.

The third Global Production Networks phase is marked by a stronger autonomy of the network; the lowering of resource requirements needed in order to enter the network and also a lowering of relational costs and barriers. Finally it is marked by a more coherent functional integration. As a consequence the number of actors engaged in the global production network expands. Small and medium-sized enterprises in growing numbers see opportunities in global sourcing. Some of them for defensive reasons – in order to stay in business. Others have more offensive reasons – they may envisage new market-oriented business opportunities sustained by their sourcing activity. This in turn expands outsourcing of manufacturing tasks in some areas and reversibly expands REDUCES??? in-sourcing in other localities and nations.

In global production networks territorial integration also increases in strength. This is thanks to growing awareness and knowledge of the business climate and the atmosphere dominating the international network. Actors are in general more experienced with international sourcing and they 'know who' is. Barriers to entry are lowered. Experiences of international sourcing are spreading, as are the rumours and fairytales of successful sourcing projects, thus affecting perceptions of opportunities. Possibilities of "mimicking" lead to a bandwagon effect, where even those firms lacking experience in international sourcing may rush to take advantage of opportunities that arise.

In the process of transformation from international to global production networks, it is suggested that interorganisational innovations play a crucial role. Some of these innovations are needed so as to facilitate the use of new information and communication technologies. This involves a good deal of trial and error. Some innovations are needed so as to facilitate the use of intellectual property rights, to safeguard actors against opportunism and to sustain credibility with a view to facilitating managerial reach and lowering possible relational risks. Interorganisational innovations are also needed in order to bridge knowledge gaps and accompany actors' coordination efforts. One of the actors playing a key role in fulfilling these tasks and processes is the Global integrator.

Connecting networks – strategic challenges for Global Integrators

Global integrators are basically characterised by the role of - expressed in traditional terms - "connecting" business networks and actors and bridging physical and cultural distances. A main justification of their business is their ability to reduce cost of entry, as well as cost of running, international sourcing activities.

But how do global integrators seize the opportunity for co-aligning production networks faced with highly different institutional settings, relationship traditions, and routines, norms and standards applied in manufacturing processes, and with highly different practices for management and collaboration?

In answer to this question, we suggest that three issues constitute key challenges to the global integrator: the challenge of bringing down complexity of knowledge transfer; the challenge of handking activity-coordination; and finally the challenge of strategic positioning.

First, as an intermediary actor they have to help the customer firm, as well as the supplier, to overcome the complexity of knowledge transfer. Since the customer is typically outsourcing production processing tasks, and keeps key production-facilitation tasks in-house, knowledge transfer is very much a matter of facilitating user-producer interaction, i.e. ensuring smooth integration of production-facilitating activities with processing activities. Following the evolving division of labour described in fig. 1 the issue becomes rather more complex than that. The variety of production-facilitating tasks may complicate the process of task-partitioning with processing activities. The complexity of this task may vary with the type of product in question – ranging from standardized commodities on the one hand to highly customised products on the other. It also varies with the range of activities the global integrator has to coach, e.g. whether product development activities -for instance prototyping- are involved. It also varies, of course, with suppliers' receptivity and absorptive capacity (Hamel, Doz and Prahalad, 1989).

Second, the global integrator has to provide support to the customer (buyer) as well as the supplier in linking and coordinating production processing as well as follow-up on activities such as quality assurance, international logistics requirements etc. A key challenge to the global integrator is the in-production quality-control capability. This is also one of the major issues arguing for local presence, along with the task of building stable relations with -and support for- the supplier base.

Third, strategic challenge to the global integrator relates to the ability to promote knowledge- transfer solutions to customers, and to needs regarding coordination of process activities that combine improved flows and lower relational costs in more efficient manners than existing or competing ways of organising flows. It is very much, in fact, a matter of creating managerial reach on behalf of the customer (buying) firm. Competitive ways of organising the interaction, including the creation of exit barriers for both customers and suppliers alike, seem to be a strategic key to this.

The challenges faced by the global integrator in his operating environment can be condensed into the following tentative list:

Their business opportunities are closely related to the dynamic changes in the GPN.
The capacity to identify and create strategic windows for customers (buyers) as well as suppliers
The capacity to bridge practices between – previously separate - local/national production networks. They bridge communities of practice.
The ability to in-source coordination tasks.
The savoir faire to install mutual credibility and create shared trust. The shift in connectedness of business relations involved can be summed up as transforming “Face-to-face” contacts into “Face-to-Face-to-Face” contacts, with the global integrator in the role of mediator.
The task of lowering relational costs and facilitating the increase in relational rents for all parties involved.

One way of characterising the role pursued by the global integrator in general is in terms of the domain it occupies and its position in the network as defined by Thorelli (1986) in his interorganisational perspective on the business network. In short he conceptualises the domain of an organisation as the mission of the organisation and the related objectives set by the organisation. The position is in Thorelli’s terms defined as a disaggregatable decision centre locating power to create or influence the network vis-à-vis other centres of power.

The domain of global integrators can thus be analysed with inspiration from Thorelli (Op cit, page 39) who identifies five dimensions to the domain of an organisation:

Clientele served
Products and services produced
Functions performed
Territory covered
Timing established

In the same way the position of global integrators may be analysed with inspiration from Thorelli (Op cit, page 40):

Economic base of the organisation
Technology mastered
Expertise accumulated
Trust attained
Legitimacy

Based on these two concepts and their dimensions the generic role of global integrators may be outlined in terms of the:

Production of connectivity in the international supply network of relevance
Their translation activity, in which they exchange interpretations between client and supplier in order to gain a shared sense among the parties of conditions governing the relation and the single transaction. The

degree of shared interpretation is decisive for the trust building as well as for the mutual commitment and knowledge exchange.
Established timing of related activities in the supply network
Creation of territorial reach for client as well as for supplier
Combining of functions of the parties with related activities in the supply network

In fact, they lower relational distance and costs for the actors in the network. In short they provide managerial reach by taking on intervening tasks of coordination, control and support. So said, managerial reach is founded on a number of characteristic exchange processes attached to it. One is the development of mutual commitment in the interaction, from which follow reliability perceived and realised in the exchange process.

In the next section the generic role outlined above is illustrated using two cases from a field study in Shanghai (2002 and 2003). Both of these cases are results from an ongoing research project named 'Growth through global sourcing'. The core aim of this project is to study how small sub-suppliers succeed in their efforts to source manufacturing tasks in China.

Two examples from case studies

The two case studies – Global Industries and Sinoscan - are presented and analysed in the following sections to describe and exemplify the roles and positions taken by global integrators,.

Global Industries[4]

Global Industries is a registered Danish company with a representation office in Suzhou in China.
The firm was established in 1999 based on a joint investment by Asia Base and a Danish plastic manufacturer.

The start up of Global Industries is a result of the business ideas developed by Asia Base, a China-based European consulting firm specialising in market and legal research, as well as business audit localization and legal establishments. It was established in 1994.

Asia Base is dedicated to consultancy. It was therefore decided to establish Global Industries as an international production and logistics company specialising in outsourcing of Danish manufacturing process activities and products to China.

Global Industries comprises a Technology Centre in Suzhou and a commercial centre in Copenhagen.
Total staff is estimated to be around 15. Global Industries has experienced a boom in their business over the last 3-4 years. High growth, especially in small customers, is anticipated.

The clientele served

Global Industries has a long list of reference customers witnessing the wide range of industries served. Global Industries has, amongst others, served firms in the tool and machinery industry; the furniture industry; household appliances; agricultural machinery; processing equipment and construction tools.

The firms served are mainly SMEs, some of which have previous experiences in international sourcing. Most of the firms served have their registered offices in Europe, although a few of the customers have invested in facilities in China.

Services provided

Global Industries has built up its production capacity via facilities owned by a pool of Chinese manufacturers, all of which have been certified by the Technology Centre.

While the Technology Centre specialises in core functions such as engineering, the certification of suppliers, production planning, coordination and monitoring of suppliers production – quality assurance and delivery

[4] Based on interviews with Peter Rasmussen, Asia Base and Global Industries in Souchu, in 2002 and 2003

service, production capacity is placed with a selected base of manufacturing suppliers. The Technology Centre also has access to local technological support institutions and laboratories in China.
The activity span is wide, ranging from simple standard components, through custom-made components and systems, and right through to the production of final apparel and involvement in product development and prototyping.

Global Industries, then, offers a range of service packages between two extremes. On the one hand the customer can choose to let Global Industries operate as a system supplier on a permanent basis. On the other, Global Industries has developed the "BOT-project" approach (Build-Operate-Transfer) in which Global Industries takes on the task of running outsourcing activities of the client, operate the supplied production for a stipulated time-period and then transfer a going relation to the client.

Global Industries emphasise that the on-going dialogue with clients as well as the creation of mutual visibilities between clients and Chinese suppliers is a core in the way Global Industries do business.

Functions performed
Global Industries has a Customer Service Centre in Copenhagen and a Technology Centre in Suzhou near Shanghai. The Customer Service Centre basically handles customer relations in order to provide proximity to the client.

The capabilities of the Technology Centre include a number of related skills, such as 'Supplier mapping'; 'Product development Support'; Production and Logistics Planning; Materials Specification (including translation); 'Supervision on Component Production'; 'Assembly Monitoring'; 'Testing Facilities'; and Surveillance of Packaging and Shipping'.

The network of suppliers is concentrated on firms specialised in the fields of plastic moulding; metal moulding; traditional and high-technology processing in metals, and finally surface-treatments.

Territorial spanning provided
Global Industries serve clients from Scandinavia and the rest of the EU. The supply network developed is restricted to China, mainly the Eastern part of China. Global Industries is considering options of expanding the supply network to Vietnam and Taiwan.

Timing of activities
Global Industries stresses that the ultimate target is to provide customers with the feeling that when sourcing in China things are just as easy and timely as when sourcing domestically.

Sinoscan[5]

Sinoscan was founded in 1998 by two colleagues, who were both engaged in the set-up of Alfa Laval production facilities near Shanghai in China - one as a managing director, the other as head of production. Their main experience is in stainless steel. Based on their experience from Shanghai – including the many personal contacts they built up during their stay there – they decided to start Sinoscan soon after they returned to Denmark.

While Flemming (FN) initiated the firm in Denmark, Uffe hired a Chinese engineer as manager of the technical office in Shanghai and got Sinoscan registered in China.

Sinoscan was founded on an agreement with Alfa Laval Denmark covering a three-year horizon and the task of sourcing 20-30 different components in stainless steel in China over that period. This initial deal provided the opportunity to recoup on setup and development costs of the firm.

However, after no more than 6 months operations, Sinoscan got enquiries from other customers as well as from Alfa Laval for items other than stainless steel. Business prospects are seen to be booming.

[5] Based on interviews with Flemming Nielsen, Sinascan (March 2003) and 2 trips to Sinoscan in Shanghai in 2002/2003.

The clientele served
Today Sinoscan still works for Alfa Laval Denmark/Sweden, but major parts of turnover lie with other customers. There is no contact with Alfa Laval China – they seem to view Sinoscan as a competitor.

Their typical customer is a large or medium-sized manufacturer with a certain scale of manufacturing activity and with considerable export activity. This profile of customer is seen as the most promising, in fact. Although Sinoscan has undergone growth of more than 50 percent per year since setup, the customers served are deliberately limited in number. Growth is mainly a result of growth in sales to existing customers. However, growth potential is seen to be much greater than 50 percent, but it is judged that too high growth rates will be damaging to the dependability and reliability of the China office, and perhaps also to management in Sinoscan overall. The infrastructure of the firm – including relationships with suppliers – keeps pace with the rate of growth. Recently the number of new customers has grown in fact, but this has direct consequences as each new customer requires huge investments to take them from the initial inquiry stage through to production start-up.

Services provided and functions performed
Sinoscan operates as a systems supplier for an international portfolio of customers. Sinoscan has no production of its own, but relies solely on a network of Chinese suppliers. These suppliers operate in stainless steel, castings, plastics and different sorts of production processes using black iron. Suppliers are carefully selected, and for some of these Sinoscan is the dominant customer. Relations are stable and tight and Sinoscan provide their suppliers with new technical knowledge, for example on materials and tools. In some cases they also help with the purchase of machines and tool from Europe, and with documentation for ISO certification. In some cases certificates on components and processes are needed from Europe.

The services provided by Sinoscan are mainly custom-made components and -in some cases - subsystems. Their strategy is not in the production of standard components (due to strong competition) and final goods (danger of imitation). They only deliver components at industrial quality - not design quality - level.

The staff in the technical office in Shanghai translate the drawings into Chinese, while parts specifications are kept in English. They also control prototypes and drawings and make frequent on-site inspections, and inspections in the technical office. The staff is in a situation of permanent struggle to obtain appropriate quality levels, but this fight is seen by Sinoscan as being part of their basic *raison d´être*. Sinoscan provides the needed documentation and certification. Ensuring quality assurance is seen as a critical capability dafining Sinoscan's role and position.

One of the reasons Sinoscan is competitive vis á vis their clients is – in the words of FN – that they focus on the task at hand, namely sourcing. Sinoscan has a well-developed network of Chinese suppliers. They are normally not put into direct contact with customers. Sinoscan has the strategy of spreading production tasks across a variety of suppliers, and coordinating their efforts.

Territorial spanning provided
Most customers are located in the northern part of Europe, but Sinoscan has recently set-up a commercial office in the USA. The owners have deliberately chosen to focus exclusively on China, since they find that further diversification will complicate their business.

Timing of activities
Sinoscan also delivers CIF direct to the customers' doorstep. The service provided is – in the words of FN – basically: *"We take on all the bother – our customers in principle deal with a Danish firm. If they should happen to get defective items, we immediately send a credit note and supply them with a replacement item."*

Summing up on the two case-studies
The two enterprises in case have strong similarities in their role as global integrators, but also display marked differences.

While Sinoscan serves a narrow and carefully selected clientele of medium sized and large experienced enterprises, Global Industries has a broader scope with main focus on SMEs, and mainly firms with little or no experience in international sourcing.

Sinoscan has strong focus on custom-made components, and they find that their main competitors are the customers' own divisions in China and elsewhere. Because of this, they do not allow customers' direct contact with suppliers. Global Industries, on the other hand, seems to have a broader scope in the activities provided. This includes invlvement in product-facilitating activities such as prototype development, parts design and the so-called B-O-T concept. In contrast to Sinoscan, they emphasise transparency and direct dialogue between customers and suppliers.

These two Global Integrators thus provide managerial reach of different kinds, in different ways. Sinoscan step in as the coordinating third partner in relationship building, keeping customers and suppliers relations to a minimum. The philosophy is no doubt based on the characteristics of the customers served: experienced and resourceful. In contrast Global Industries has a more flexible approach, leaving clients with the choice of the level of direct relation-building to suppliers. This philosophy is apparently based on the characteristics of the SME clients served: their lack of experience and of resources required to handle relationship-building with suppliers.

Towards a typology of Global Integrators

Since the research is still in progress, it is too early to suggest a final typology reflecting the multi-facetted roles taken on by Global Integrators. In spite of this, the two cases do leave some room for initial thought on how to go about establishing a typology of Global Integrators with respect to how they create managerial reach. This is based on a few general reflections concerning specifically the difference in roles identified in the case-section, and finally on reflections of a broader scope.

In general the typology proposal is based on the integrative role of global integrators in the GPN. An activity chain perspective is adopted, in which task-partitioning and activity-coordination are at the centre of the analysis. It is suggested that the variety in services offered by 'global integrators' subsequently be analysed in a resource-perspective, relating the resources of the sourcing enterprise to those resources offered by different types of global integrator. The roles identified can then be associated with differences in domain – related to their relational functions performed and clients served - and their position - related to the resources they possess in terms of technology and expertise.

Global Integrators thus take part in the coordination of activity flows crossing over firms' boundaries, of managerial traditions, and of differences in technological systems. Managerial reach is created by in-sourcing relationship management activities from the customers as well as the suppliers. The activities in-sourced mainly relate to production-facilitating tasks (the buyer customer) and follow-up on production (the supplier) including international sales and relation marketing.

Two factors are tentatively seen to contribute in defining the ways firms create managerial reach. On one side is the range of in-sourced activities; on the other is the important issue of degree of openness when relationship-building. Global Integrators can thus participate in the coordination of activity flows:

1. by taking possession of coordination activities between customers' production-facilitating activities and suppliers' production-processing activities
2. by assuming responsibility for the final product delivered to the customer and
3. by their support to direct coordination between customer buyers and suppliers via inspection, monitoring and logistical services.

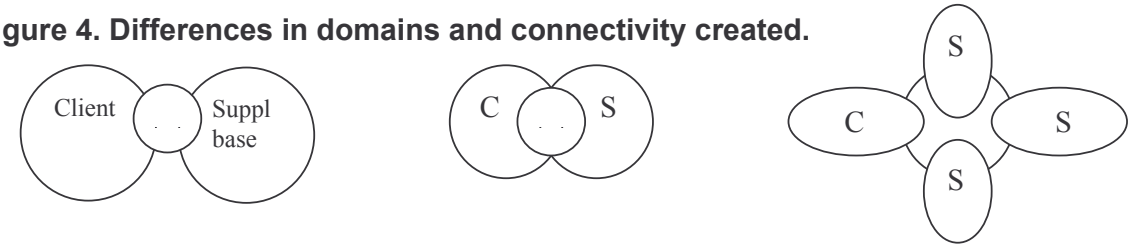
This leaves a large possible variation of roles for Global integrators, spanning from the role of facilitator of standard component supplies, the role of custom tailoring component supplies, the role of sub-system supplier, the role of system supplier and the role of contract supplier, delivering final equipment and OEM parts.

For the two cases presented, they demonstrate quite a contrast in terms of creation of managerial reach vis á vis their clients. Sinoscan, on the one one hand, facilitates internal coordination within their large customers' divisionalised organization. They also lower the level of FDI their clients need to gain managerial reach and, lastly, they contribute to the rationalization of the buyer customers' supply base. Global Industries, on the other hand, focuses mainly on facilitating external relationship management for their

smaller customers. They adopt the role of the local representative and thus save their customers from the need to invest in overseas staff.

From a broader perspective, these reflections point to a basic distinction in the creation of managerial reach, namely the degree of overlapping domains, as illustrated in the figure below.

Figure 4. Differences in domains and connectivity created.



Sinoscan case Global Industry case Case of multi-country Co-ordination

Discussion and conclusions

Although Global integrators operate with a variety of different customer types, service provided to SMEs is of key importance. They have in fact a dual function. They produce relational value to small *customers* by their supply of relational skills, and they produce relational value to small *suppliers* by providing access to international markets and customers. This joint function is likely to be the core issue elative to Global integrators' success over the next few years.

The Global integrator has the ability to understand and connect two or more production networks, better than SMEs in the networks. Through their relational service to SMEs they contribute to major changes in the structure as well as the functionalities of the GPN. They pave the way for new types of actors and they combine resources that have not been combined in the past. In this respect entrepreneurial opportunities are created for a huge number of actors.

They also pioneer new ways of entering the GPN. In the past global sourcing has been highly associated with FDI along the lines of 'Think global, act local'. Global integrators, their roles, and their capabilities, make it feasible to configure sourcing activities without huge financial investments, although the organisational and managerial changes needed may be of importance. Global integrators thus reduce relational costs and – in actual fact, in extreme cases – can be considered to 'domesticate' global sourcing costs.

Global integrators may be viewed as a new type of coordination centre. Through their relational activities they link established centres of coordination. Through their activities distance problems are handled, with minimising of relational distance. They improve relational proximity.

To understand the governance structure in a production network, proximity over time is needed. It is primarily through daily activities within the network this is gained. SMEs often cannot solve this problem through overseas personal, because the cost of employing, educating and training these employees is very high, and the risk of failure is high too. Compared with cost of domestic production this can be too expensive a solution, thus hindering effective global sourcing.

Based on our present study of Sinoscan and Global Industries, we can see two contrasting types of Global integrators, namely a catalyst type first of all (Global Industries) with an open connection (BOT), and secondly an "arm's length" connecting type (Sinoscan) explicitly and deliberately keeping buyer-customers and suppliers apart. In many ways the Sinoscan case reflects the traditional point of view in the literature i.e. that of actors spanning or bridging – i.e. "connecting" networks or national markets. Even if in this particular case Sinoscan "bridges the gap to keep network actors apart". The Global Industries case, however, at the other end of the scale, opens up new perspectives in that this firm can be seen to be not just carrying out a

bridging function, but actually actively participating in setting new rules and changing the face of the global production network.

These two types have each their specificities, and their strengths and weakness when it comes to the creation of managerial reach. This will in turn influence their future role and strategic positions, and indeed help or hinder in the shaping of the nature of the markets they work in . A matter which will be the focus of discussion in a future paper.

But the two cases and the analytical reflections on the role of Global Integrators have hopefully demonstrated a research agenda of importance, namely that of innovation and entrepreneurial opportunity-creation embedded within the functioning of the global production network.

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