Reconsidering the Geographical Flows of the Global Knowledge Economy

The Example of Indian ICT-Based Knowledge Flows to Sweden

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Abstract

This article discusses the geographical flows of the global knowledge economy and their unstable and rapidly changing nature. We use the development of activities in ICT (information and communication technology) in India and its connections to Sweden to illustrate changes in international business. The article explores the ways in which transformations in geography and spatial relations, politics and management are causes and effects of rapid and profound transformations in the global economy. The transformations we illustrate provide reasons to reconsider the conventional idea of uneven power relations in the world, between the stronger "global North" and the weaker "global South". Firms based in the global South and in India develop their organizations and capabilities to compete for market share worldwide, and on the same basis as firms based in the global North.

1. Introduction

Since the Second World War, trade has increased more than production, and foreign direct investment (FDI) has increased more than trade [1]. Trade and FDI are important components in the development of the global economy and lead to interconnections and interdependencies among places, organizations and people around the world. This development of an increasingly integrated global economy goes hand in hand with the developments and innovative use of technologies, among which ICT is the main component. FDI not only spurs the internationalization of business organizations but also serves as an effective means of sharing sensitive and tacit knowledge about local business environments [2].

The development of the global economy has until recently frequently been described in terms of a core periphery pattern. More recently, however, this picture of a simple divide between the rich and industrialized world in the core or the "global North" and the poor and natural resource-based economies in the periphery or the "global South" has been challenged. A number of economies in the global South have developed to adopt new roles in the global economy. Roles such as receiving and sending, acting and reacting, sourcing and supplying are far from easily and consistently divided between the global core and periphery. Indeed, international trade and business are no longer the preserve of Western firms, but are highly sought after by many firms from developing countries. For example, recent studies suggest that Indian IT firms invest abroad to maintain proximity to their Western clients [3]. These trends show the reverse flows of capital and indicate the possible beginning of a new era of organization of the global knowledge economy. The latter issue —the qualities of the reorganization of the global economy and the roles that firms in the "global South" and particularly India may take in this transformation—is the core concern of this paper. Thus, India is proposed as an important example of how a country in the global South is challenging and transcending the traditional role of countries in the global periphery. We use the development of ICT activities in India and its connections to Sweden to illustrate changes in international business.

In this paper, we discuss the development and transformation of the global economy, multinational companies (MNC) and international business. To aid in this, we refer to debates and use methods from several disciplines—sociology, business studies, geography, and communication studies—and we integrate ideas about globalization, international business, institutions and organizations, social space of firms and ICT.

The aim of this paper is to develop our understanding of the shifts in the global economy. Our main argument is that globalization is not a deterministic and "pure" economic and "a-spatial" process. In contrast, we illustrate the important roles of geography, politics, technology and management. We do so by illustrating that the geography and organization of the global knowledge economy is under constant change and flux, and that this relates to societal and management processes and decisions.
The paper is divided into six parts. This introduction, as the first part, has introduced the topic and defined our aim. The second section describes the relations between India and Sweden within the ICT industry, and is followed by a section on the geography of the global economy. Section four examines politics, policy and cultures of the global economy,

considering the actions of governments and trade organizations in addition to other bodies and discourses of cultures. In section five, we present views on the organization and management of firms and the role of ICT tools and knowledge management in the development of the global interactions of ICT. These sections on the geography, politics and organization include conceptual discussion and empirical examples of ICT in India. In the sixth and final section, we conclude the discussion by outlining some implications for our understanding of transformations and outcomes of shifts in the global economy.

2. ICT in India and its relation to Sweden - quantitative and qualitative changes

In this paper, we explore shifts in the global economy and international business through which the structural divisions between core and periphery, political borders and hierarchical relations are challenged. We study a particular set of economic ICT activities conventionally categorized as services. They include software development as a major activity, and database services, web services and various ICT consultancies.

ICT is a young industrial sector that developed during the most recent wave of technological changes—the fifth ICT Kondratiev wave. ICT activities thus reflect recent economic structural shifts. This shift had computers, digital information technology, Internet, software, telecommunications, optical fibres, robotics and biotechnology at its centre. The main infrastructure is digital networks and satellites. Networks are becoming the basic organizational forms for society in general and for business in particular [1 p. 78–9].

The waves of technological changes in history have brought geographical shifts of economic growth and development. The fifth ICT Kondratiev wave has involved strong and important growth in Asia. India has not been an early mover in this resurgence of Asian economies. However, more recently India has emerged as an important part of the global economy.

The rapid and strong growth of ICT service in India and particularly from the early 1990s reflects a large increase in export of ICT services. Exports of computer and information services corresponded to 50 per cent of all exports from India in 2009. In this way, India has become the largest exporter of ICT services worldwide [5 p. 249].

Since the 1990s, India has been seen as the prime global sourcing destination of the software industry. Important factors underlying this trend include level of education and English language proficiency, as well as government policies regarding investment and the stability of the political climate [5]. Initially, the software industry was characterized by low skill levels; however, after 2000 it has progressed to higher value-added activities. This transition marks the first rise of a developing nation to become an important player in the global economy, and is almost solely based on immaterial goods, namely data streams of different kinds. Starting with the ICT-outsourcing movement drawn by the low cost labour force rather than the local market or knowledge, research and development divisions have followed. Finally, the central position of ICT and ICT-based services as a critical business factor, India's position as an important global player will be strengthened [6]. A 30% expected growth rate of the ICT-sourcing sector in India is but one proof of this [5].

The development of the sourcing industry in India was supported by the highest state officials. Indeed, in 2000 the Indian prime minister announced a five-point agenda for developing India into a knowledge society [7], with the following critical factors:

- Creation of an organizational culture that emphasizes trust
- Encouraging inter-organizational relationships
- Designing processes that enhance tacit knowledge transfer
- Implementing mentoring programs
- Building general management capabilities

Keeping the geographical perspective in mind, it is important to note that this expansion and success of ICT exports from India is derived from the development of activities in a few regions among which Bangalore, New Delhi and Mumbai and some of Mumbai's surrounding districts constituted the dominant nodes of this industrial development [8, 10 p. 673].

One important factor behind this increase in exports from India is the increase of location of multinational ICT companies and the increase of ICT outsourcing there. FDI in India has increased substantially since the early 1990s, exceeding flows to most countries in the world [10 p. 14].

However, while economic values of outsourcing and offshoring activities are one reason, recent debates in the literature raise other important issues of the far-reaching benefits of mutual learning through the outsourcing and offshoring networks between Indian ICT service providers and Western buyers. For example, Choudhuri et al. [11] recently found a number of outcomes from customer–vendor relationships in ICT sourcing in India. More specifically, the study reveals that business objectives for outsourcing primarily focus on core competences by the sourcing customers. It was found that the financial benefits are outweighed by the technical superiority of the final solutions. This indicates the learning outcomes of offshoring engagements suit the requirements of customers operating in competitive environments and thus have

to compete on the basis of technical superiority in every aspect of their business offerings.

Some of these international flows of trade and exchanges in international ICT business from the perspective of India involve Sweden. In trade, imports to Sweden from India have increased. Sweden is the 14th largest source of inward FDI in India. This corresponds to less than one per cent of all FDI in India [12].

The figures on quantitative growth of business in ICT based services in India raise questions about the qualitative aspects. Does the increase of international business in ICT in India generate resources for wider growth of the economy? Although research [8, 9] describes a transformation from body shopping of ICT workers into more advanced activities employing educated ICT engineers, there are also indications about failure in developing business to add greater value and conduct innovative activities. The ICT sector in India is divided into three main categories: designing chips, generating intellectual property (IP) - for instance to derive revenue from a customer licence fee - and designing software services.

Parthasarathy [8, 9] suggests possible hindrances to continuous qualitative advancement of ICT in India. These hindrances are the increasing wages of ICT-skilled workers and the lack of advanced domestic clients. The trend toward substantially increasing wages for educated ICT engineers in India requires employers to increase their revenues. The means of increasing revenues is to work in product and process development. In sectors such as ICT, knowledge development is typically supported by intensive and close contact with clients. Therefore, the lack of domestic market in India for sophisticated ICT solutions may be a severe hindrance to increasing revenues. Interactions with clients for product and/or process development tend to be complex and are strongly supported by geographical proximity.

ICT activities are conducted by knowledge-driven companies and depend on a supply of high quality and skilled engineers. Although the supply of graduates from engineering education programmes in India is huge in terms of quantity, the quality of the education programs varies immensely and some are deficient [13]. Thus, the supply of highly qualified ICT engineers in India may be limited, and indigenous Indian firms may be outcompeted in attracting skilled staff by multinational firms presently in India. This risk is evident in the latest ranking of “India’s 50 Best Companies to Work For in 2011” which comprised 16 firms in Information Technology. Among these, Google, Intel, Scope, Agilent and NetApp belonged to the 10 highest ranked companies and all except one are based in the US. The exception is Scope, which is a UK-owned subsidiary. The list is largely dominated by US firms. However, and important to stress, only four of the 17 firms in Information Technology ranked among the 50 best companies to work for in 2011 are India-based companies. These companies are Intelenet Global Services, HCL Infosystems, Firstsource Solutions and BrickRed Technologies [14]. Among these four ranked companies, HCL Infosystems has a branch located in Stockholm, Sweden [15]. This low attractiveness of Indian firms to skilled staff is a reflection of the image of India and Indian firms as followers in the ICT sector rather than leaders in the development of innovations and new solutions [16]. Most skilled and competent workers seek demanding and challenging employment that can offer roles in high skilled development projects and teams, and such jobs are expected to be available particularly in international and US firms.

Recently, there has been a growth of outward FDI in ICT from India to other countries in the world. The pattern of the outward investment of Indian ICT firms has typically involved a first round to the US, a second round to the UK, a third round to Germany and thereafter to the Nordic countries, among which Sweden is the major location closely followed by Denmark [13]. In June 2010, a Swedish business journal presented a list of approximately 40 Indian firms present through FDI in Sweden [15]. These companies have typically been established through initial contacts with local clients in Sweden [17].

To summarize, in this section we have described the development and growth of ICT activities in India and relations in this sector between India and Sweden. We have also considered some issues of context for this development considering both global and general structural trends and conditions in India. Hopefully we have illustrated how ICT activities are critical components in the structural development of the world economy, and that India has recently strengthened its role in this context. India is rapidly becoming a globally dominant economy in a critical sector of today’s technological and economic regime. We now move into three sections that further explore the context and conditions for the development of ICT activities in India through three lenses: geography, politics and discourse, and management.

3. Geography

In the field of economic geography, there have long been debates over the effects on national economies and local milieus of the global economy. Concerns include the effects of international trade, international foreign investment, flows of resources (e.g., finance, knowledge, labour), and the geography of firms and their networks (i.e., the location of various units and partners). Discussion of the spatial division of labour in the geography of (world) economy has been an important point of departure

for economic geographers. The concept of spatial division of labour was originally developed with manufacturing production in mind, and it captures the strategic process through which companies divide their businesses in space—at different geographical locations—intending to minimize production costs and maximize economic revenues [18].

The location pattern developed through spatial division of labour is on one hand the location of routine and standardized functions to places with relatively lower conditions and labour costs. In the early waves of spatial division of labour, these locales were largely within industrialized countries and in sparsely populated and remote areas. More recent geographical patterns of the spatial division of labour have been on an international scale. FDIs in low-cost countries—many in Asia—have been an important means for companies to lower production costs. In contrast to decentralized location patterns of routine tasks in the production chains, headquarters, management, and research and development offices—particularly for large MNCs—tend to be located in prestigious and high-cost locales in major cities. These places, in turn, stand out as the loci of and access to competent labour, advanced infrastructure, related firms, political bodies, higher education institutions, and a variety of network organizations.

In this light, the international division of labour means flows of FDI. The growth of FDI has also brought growth in intra-industry and intra-firm trade [1, p. 7]. FDI in countries may be inwardly or outwardly directed. Increases of inward FDI in India and Sweden provide two examples of the very rapid growth of this flow. Calculated as the share of gross domestic product (GDP) inward FDI to India has increased from 0.5 per cent in 1900 to 9.9 per cent in 2008. In Sweden, FDI as a proportion of GDP has increased from 5.3 per cent in 1990 to 52.9 per cent in 2008 [1, p. 22]. While it is indicative of the increase of international flows of capital, the growth of FDI has until recently primarily concerned the manufacturing industries. Analyses often indicate that FDI flows induce major de-industrialization processes and losses of manufacturing employment in countries with relatively high labour costs, not only in the US, but also in Western Europe and Sweden [19].

A more recent wave in the reorganization of the global geography of production and firms has been conceptualized [20] as the second global shift, highlighting the increasing roles of the service industries and the outsourcing of service work and emotional labour. Although ICT has been an important means for MNCs to organize their businesses in international networks regardless of sector, in the second global shift ICT stands out in two ways. First, it has become the major technology for the production and communication of the (service) product to the market. Second, it is the final output of the production process, for example in commodities such as ICT services, software development and Web design.

In the global flows of trade and FDI, major MNCs have considerable roles and impact. However, it is important to note that SMEs (small and medium-sized enterprises) are also largely involved in international business through trade or FDI. A small economy such as Sweden has a small domestic market for sales, and specialized and knowledge-intensive firms typically need to become internationalized and export to international markets. The globalizing economy, international division of labour and global shifts develop in uneven geographical patterns. In the literature, the extensive pattern of the uneven global development has been described in terms of core and periphery, developed and underdeveloped, First and Third World, and North and South. Recently the discussion about a more complex uneven development has arisen and models for the territorial divide between parts of the world are argued to be simplified representations of the distribution of resources. Instead, the global order or distribution of resources is to be found inside national borders and city regions. Some researchers even propose an alternative interpretation of a more geographically complex world order, in terms of "dislocating the centre" [21 p. 820]. This argument is a critique of the conventional idea of modern development springing from urban cores in the global North (i.e. primarily Euro-American cities) and gradually spreading to regions and cities worldwide. Instead, global modernity as well as social disorder and slums are present in (city) regions worldwide.

The globalization of organizations is not "frictionless enterprise". Quite the contrary; there are numerous challenges that firms must overcome to manage their international interactions and networks. These involve labour turnover, contract definitions, local context regulations and standards and long-distance and international co-ordination [22]. In the context of challenges and possibilities, organizations manage and organize offshoring in many ways and organizational forms for offshoring are continuously rearranged. Three strategies for outsourcing have been defined [5]. The first is the hybrid strategy, which means that there is a captive centre that outsources work to local providers. Second is the shared strategy when the captive centre provides services to the mother company and to other clients with the aim of obtaining economies of scale. Third is the disinvestment strategy, which entails divestment of the captive centre.

In the special case of offshoring to India, this has largely been related to providing mental labour to the international economy [6]. This includes offshoring

of services that are customized and/or professional work, which tend to globalize at a slower rate than more routine or manufacturing work. This is for three interrelated reasons: first, regulations around professional work and the power of this workforce; second, the difficulties of definition and therefore communicating the content of such tasks in detail. The third reason for such obstacles concerns services—in their ideal type—that need face-to-face contact for production and delivery [23]. Changing organizational forms for service industries and service activities and the development of ICT support entails products and activities conventionally categorized as services being communicated by means of ICT.

As mentioned above, the location of a branch of an Indian ICT firm in Sweden is typically preceded by contracts with one or several client firms in Sweden. The establishment of Indian companies in Sweden by Invest Sweden follows this procedure. Once an Indian firm becomes involved in a business, it may receive a few orders; it can establish an office in Sweden. The work by the Indian providing firm is performed by Indian consultants who fly in from India, and the majority of the work is conducted offshore in India [13].

Indian firms in ICT have historically been primarily involved in services such as IT infrastructure management, a kind of takeover of maintenance and support of hardware and software applications. This can be considered the first step and a rather routine type of service. Thus, the experiences are that Indian firms establish branches in Sweden primarily to supply local clients with relatively standardized services. The second step in advancing IT services is to develop custom applications. This mainly concerns IT outsourcing. The third level involves work tasks requiring domain knowledge of particular industries—for instance, the automobile or banking industries—because these involve developing and designing ICT applications for more particular needs [13]. We return to this advancement in IT services in the section about management below.

In the global economy, price competition for routine and standardized ICT services is severe, and therefore companies in such a business lower their production costs. In the global economy and through international division of labour, the supply of low-cost labour in India is available for all firms regardless of the company's national base. This means that ICT services firms located in Sweden make use of labour in India regardless of whether they are Indian, US-based or indigenous Swedish companies. The interesting change in the global economy is that Indian companies have begun to conduct business internationally and reap revenue from their cost advantages.

In terms of the logics of international division of labour, the most advanced and highly skilled research and development, as well as command and control functions, including headquarters, are typically sited at the core locations. To determine the geographical location of the core may be less straightforward. The core can be defined according to different geographical scales: national, regional or global scales and in a variety of positions. So far, the international division of labour of Indian firms has not involved locating highly skilled activities such as research and development in Sweden [13].

We also need to consider space, as stressed in the introduction. Some functions, such as routine and standardized work, move more easily than others do in the global economy. To understand the location of more advanced functions of companies we also need to understand frictions of space through politics, policy and cultures. We need to understand the geography of supply of such external resources as infrastructure and higher education, and we need to understand management. These issues are discussed in the following sections.

4. Politics, external resources and cultures

The issues of geography of international business and international economic flows discussed above are strongly dependent on political regulations and cultural settings. The role of politics in the development of ICT in India is strongly apparent. Since the early 1990s, a number of political decisions and measures have been taken to support the development of the ICT sector in India, which had just opened up for trade and FDIs [8, 9, 10, and 24]. Resources "outside" companies are important for the development of firms (cf. [25]). Such external resources include assets such as transport and communication infrastructure, education institutions, venture capital sources and different network relations through which knowledge and experiences are shared. Such resources may be supported and developed through political bodies and policy.

The Indian government has made major investments in higher education in engineering and ICT [26] and trade organizations and chambers of commerce brought network resources. The Bangalore-based India Semiconductor Association (ISA) and the Delhi-based NASSCOM for the software and service industry are two such trade organizations [8 p. 258]. In May 2010, NASSCOM brought a delegation to Denmark and Sweden. The delegation comprised Indian ICT companies and government organizations from the regions visited. The delegation made two stops in Sweden, Stockholm and Gothenburg. In the press release from NASSCOM about this delegation, the Nordic region is described as "outward-looking European countries

with non-discriminatory and open markets…". The same press release cited "[h]igh IT adoption, acceptance of English as a language of communication, lower resistance to offshoring and large public sector spending on IT…" as important elements facilitating the successful establishment of Indian firms [27].

Thus, the elements stressed relate to cultural norms and "ways of thinking and doing" such as being "outward-looking", non-discriminatory, and having high levels of IT adoption and the possibility of communicating through a shared language (English). NASSCOM also appreciates political institutions present in the Nordic region, such as open market and large public sector spending.

International business spans national borders and cultural settings. The understanding of cultural settings is an important resource for firms in establishing trust in their business relations. The debate about different business cultures is extensive and in this paper, we briefly explain our stance on this issue and provide some illustrations. We avoid the notion of culture in terms of a stable and comprehensive cultural setting. Instead, our interest is in firms' coding of or their discourses about business culture. Thus, culture is discussed in terms of representations and discourses. A discourse is a (spatially and/or temporarily) shared understanding and is particularly developed through power relations.

One illustration of discourse of the business culture in India is derived from the website of the Swedish chamber of commerce in India. This organization conducts a variety of activities including workshops for firms located in India. The chosen topics for the spring sessions in 2011 may be interpreted as a list of perceived cultural and structural features of business life in India among Swedish firms in India. The list of topics is [17]:

- Corruption (code of ethics)
- Working conditions (overtime, etc)
- Waste management (Legislation, compliance, etc)
- CSR initiatives
- Sourcing; Branding in India
- Female leadership in an Indian working culture

Our second illustration of coding of culture is from the perspective of Indian firms investing in Sweden. NASSCOM organized a seminar in which aspects of the Swedish culture was one topic. As an example, here is a list of aspects considered important cultural features of business life in Sweden presented by an Indian firm (HCL Infosystems), established in Sweden[29]:

- Punctuality is very important
- Content is the key
- Consensus of all stakeholders
- Trust; Job security
- Diversity in workforce
- CSR
- Takes time—please invest in relationship
- Small pond—everyone knows everyone and references work;
- Loyalty—if you get a customer and deliver good services, the relationship will last a long time

Thus, although strong waves of deregulation of formal barriers for trade and FDI between countries have recently occurred, through which countries such as India have emerged as prime markets for ICT globally, there are also more qualitative aspects of international interactions. There is a need for companies to learn and develop strategies to work in and between places with contrasting qualitative sets of discourses about business life.

5. Firms, management and communication

In light of business expansion in the era of globalization, the challenges in managing firms and the complex nature of the interactions between the "core" and the "periphery", one may ask how organizational boundaries are drawn. While this has been one of the classic questions of organization theory [30] few researchers seem to offer a comprehensive view of what constitutes the boundaries of a modern, globalized, knowledge-based firm. Various conceptual models in this research field explain organizational boundaries according to the nature of activities that take place, the positions that members or actors of the organization hold, and the network linkages that each individual creates with members of other organizations [30]. There is no comprehensive conceptualization of the nature of organizational boundaries for firms that are

(a) mutually dependent on a global network (e.g., buyer-supplier relations in ICT outsourcing/offshoring settings),
(b) with relations distinguished by unique cultural features,
(c) in dyads marked by distinct practices with roots in different communication patterns, and
(d) communicating in dyads as the constitutive basis for the modern knowledge-based multinational firm.

All four features are typically present in international businesses involving interaction between the Indian and Swedish markets.

In an attempt to resolve this issue, we present the idea of the competency boundary. Before we do so, however, it is useful to place our discussion in context. In particular, we draw on the recent review

of various boundary conceptions presented in Santos and Eisenhardt [31]. In their discussion, boundaries are drawn according to a variety of organizational issues: the locus of costs (i. the efficiency lens), influence or autonomy (ii. the power lens), resource and capability decisions (iii. the competence lens), and the coherence of individuals' mind-set or identity (iv. the identity lens) [31]. These four lenses do not exclude the presence of other organizational boundaries. In fact, organizations are compilations of boundaries in which these four conceptions are present to a varying degree at different points in time. However, for the purpose of this paper, our focus will be on the competence view. The main reason is that the competence conception encompasses a great deal of what the efficiency conception neglects because it "raises the level of analysis from the transaction to the organization's resource portfolio" [30 p. 499].

Thus, competence boundaries are determined along two trajectories: the dynamics of the market and its resources [32] and capabilities [33]. In connection to this, Araujo et al. [34 p 1256] argue that firm boundaries are determined by core (direct) and ancillary (indirect) capabilities to perform various activities: "The more firms rely on complex inter-firm relationships to access complementary capabilities, the more the boundary of the firm has to expand, to incorporate indirect capabilities mutually specialized to relevant partners". This was discussed in the section above on external resources of firms, in which this concept was also broadened beyond inter-firm connections.

A recent study [35] integrating this idea of "indirect capabilities of firms" compared the strategies of Chinese and Indian software companies and found that in contrast to Chinese firms, Indian firms have recently grown in the international software arena by aggressively acquiring competitor firms in their host countries of operation. The main purpose of this strategy, as suggested by Niosi and Tschang [35], is that Indian software firms aim to incorporate new knowledge and increase their product portfolio to improve their services for clients in related countries and industries. Moreover, what stands out as a distinguishing feature or Indian software firms' internationalization strategy is that they follow the cultural proximity logic by strengthening their positions in English-speaking countries, which also happen to be the largest, most lucrative, and well developed markets (for outsourcing IT services). However, above we have discussed how Indian firms have further extended into other markets, including Germany and the Nordic countries.

Consequently, one may expect that firm boundaries, from a competency perspective, be drawn with regard to firm aspirations, resource and capability positions, and environmental contingencies [31]. In this sense, the competence perspective includes both external and internal boundary considerations. With respect to the latter, it assumes reduced information complexity and increased flexibility [31 p 499] when markets are changing rapidly. Through effective co-ordination and integration of subunits, an organization may overcome information limitations and thus make better decisions [36]. In this respect organizations may be perceived as information-processing systems [36], requiring continuous modification of their structure to cope with additional requirements emerging from environmental uncertainties [37].

Before the rise of the Internet and its related ICT tools, international business was primarily the domain of large firms. Now, even smaller firms can afford to operate in international markets. Even business processes within national boundaries or at the exact same location are to a large extent based on ICT tools such as email, in the same way as telephone calls previously replaced many face-to-face meetings. Since the "World Wide Web" began in 1990 with the development of the protocol and the first Web browser, work arrangements have become more distributed.

To analyse the effects of (tools for) distributed work, Chudoba et al. [38] studied the employees of Intel, developing a virtuality index to express discontinuities in geography, differences in time zones, culture, work practices, organization and technology that may both bridge and widen these discontinuities. The results of this study showed that distributed teams per se have no negative impact on organizational cohesiveness, whereas discontinuities in work practices and workplace mobility do. ICT tools can help overcoming distance but not differences in how work is carried out (it may even create insecurity because ICT tools may vary as an expression of the differences in work practices) nor the personal mobility between home and work place(s).

In yet another study, however, Aspelund and Moen [39] present the role of ICT for the internationalization of small high-tech firms (in this case 150 companies from Norway). These firms operate in niche markets that are very small, thus forcing the firms to operate in many countries in parallel. The intense use of ICT was therefore positively correlated with the number of markets in which the firms operated. Indeed, ICT use is not simply a matter of data storage and transmission of simple messages - it essentially entails managing one's own knowledge through continuous revision and reconsideration of other's knowledge.

Knowledge management refers to various activities including knowledge generation/ identification, combination/ transfer, application and the storage and embodiment of the experiences [40]. These are, however, analytical categories and in

practice are intertwined. More fundamentally is the extent to which these intertwined knowledge activities and components are tacit (non-codified) respectively explicit (codified). The stickiness of knowledge may relate to both the difficulties of transporting it and to the value of "a piece of knowledge," which depends on how it is integrated with other pieces. Thus, the value of knowledge is related to contextual settings and interactions.

There are a number of factors that may cause friction in communication of knowledge [41]. These factors are interrelated in a number of ways and include physical distance, common cultural understanding, shared languages, intellectual property rights, organizational ties, political allegiances, social networks, regulatory norms, behavioural norms, trust and reciprocity. Some of this friction makes ICT an unsuitable means for communication of knowledge. Compared to communication through IT, personal meetings are more appropriate for developing mutual understanding, trust and reciprocity. Studies usually confirm that communication through IT and through face-to-face meetings mutually support efficient and trusting relations. The quotation below is one example of how firm staff members express their experience of the importance of personal meetings and interactions.

> "We are flying many employees between the offices. If you do not sit beside each other, you are losing contacts. Personal meetings are required; otherwise you are out of touch. Personal meetings create relations." [17]

In yet another interview, it was mentioned the importance of ICT engineers having "domain knowledge", which means a combination of knowledge fields in which knowledge in ICT is combined with knowledge of the specialities of particular industries and economic activities [13].

Domain knowledge is related to what may be defined as composite knowledge, in which different knowledge fields are combined [41]. This knowledge form is frequently proposed in policy for "smart growth" as a central resource in innovation processes increasing revenues of firms. This type of knowledge is rarely documented, nor is it convenient to communicate through ICT. Domain knowledge is constantly moving and transforming and is primarily communicated through interpersonal contacts. Companies with prime revenues from domain knowledge need to develop into communication-intensive organizations [42]. This importance of domain knowledge or composite knowledge brings us back to the issue of organizational boundaries discussed above in this section. Communication-intensive organizations need strategic knowledge management, and management that supports and facilitates the widening of company borders.

6. Conclusions

It was the aim of the present paper to develop our understanding of how flows of the global knowledge economy, and in particular ICT-based knowledge flows between India and Sweden are marked by the context and conditions of three lenses: geography, politics and discourse, and management. Looking into long waves of economic structural shifts, we have illustrated how several decades of ICT technology policy in India and the rest of the world has driven economic restructuring. Structural shifts have involved profound changes in the wider societal structures, the geographical pattern of the global economy, economic political regimes and the management and organization of firms. In this paper, we have attempted to illustrate such comprehensive shifts by discussing the development of activities in ICT in India and their connections to Sweden. In Table 1 below, we summarize the debates and the shifts that we have found most important in the processes of ICT in India, with future prospects in mind.

Table 1.The transformational processes in overview

	"Traditional" forms	***Transforming into…***
Geography and spatial division of labour	International division of labour primarily in manufacturing industries. A territorial hierarchical "world order" divided into a global core and periphery.	Second global shift with international outsourcing of services. An increasing number of TNCs are based in the global periphery/the global South. Flows of FDI from global south to global North. The "world order" is present inside countries, regions and cities.
National borders of politics and discourses	Regulation preventing trade and FDI. Discursive cultural borders.	De-regulation of trade and FDI. Multinational firms are developing strategies for transcending discursive cultural borders.
Firms, management and communication	Hierarchies and defined borders; communication of routine information through ICT.	Networks and organizations unbound; face-to-face and ICT communication in combination supports efficiency in learning and knowledge development.

First, increasing trade and FDI has increasingly, and in changing ways, integrated many parts of the

world. Flows are complex and bidirectional. During the past two decades, India has developed from one main location for inward FDI in ICT to an important base for outward FDI in ICT. However, economic development in India is very uneven and the polarized world order of rich and poor segments of the society are present inside India's regions and major cities.

Indian companies have developed into international businesses that can exploit the benefits of low cost indigenous labour for foreign trade and direct investment. The geography of international divisions of labour in which routine and standardized work is located in low-cost countries has become a generic pattern for companies in both the global South and global North. Simultaneously with this reproduction of the international division of labour, the development of India-based firms means that command and control centres as well as research and development are established in a global South country. Thus, we can see that the global geography of resources has become more complicated, and economic cores and peripheries may develop in geographical proximity. These developments are primarily present in major cities around the world.

Second, national borders still have important roles in the global economy. Nation states have roles as political territories where governments are strongly critical of business. This may be on such grounds as tax policy, education or labour regulations. Nation states are also important units for institutionalization of discourses about norms and values in business life, which are important aspects in qualitative interactions of knowledge-intensive businesses such as ICT.

In the case of India, the de-regulation of trade and FDI has been an absolute requirement for the growth of ICT. The roles and effects of cultural aspects in working life and in business are too complicated to summarize easily. We prefer to discuss the idea of "national business culture" in terms of discourses. We stress that here we deal with temporary and continuous changing structures of norms and values and that are taken for granted and developed in power relations in particular societal settings. Thus, in Indian and Swedish business discourses this means learning supported by the seminars referred to above, meetings between economic actors, and over time the reworking of discourses of organizations and their wider context as national settings.

Third, the discourse concerning the communication society organized through networks rather than hierarchies is also present in our discussion. Networks as an organizational form put the issues about integration rather than borders into focus. Communication has become a critical activity and knowledge a basic resource. Combinations of face-to-face and personal meetings and interactions through ICT support learning and knowledge development in transnational and trans-local relations and networks.

The ability of firms to manage rapidly changing markets for ICT services is a critical resource. This is particularly the case for firms in emerging markets such as India. For instance, the rapid increase—relative to other "low-cost countries"—in costs of labour in India will probably mean that companies and branches located in India must advance in their quality of services. Firms need to be strongly strategic in developing their main resources, among which is knowledge. One example of this is the movement from specialized IT competences to broader domain knowledge combining IT knowledge with competences in particular industries. This will require companies to transform into communication-intensive organizations.

7. Acknowledgements

This research was partially funded by the Forum for Asian studies at Stockholm University.

8. References

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