

Drivers and obstacles for global IT in the embedded multinational: A multiple case study

Work-in-progress

Peter Ekman, Mälardalen University

Peter Thilenius, Uppsala University

Steve Thompson & Jonathan Whitaker, University of Richmond

Abstract

Multinational companies (MNCs) have been actively pursuing globally integrated information technology (IT) as a mechanism for better coordination and control of business processes. This paper presents a multiple case study of five MNCs' experiences with global IT initiatives and explores the drivers and obstacles they encountered. We conceptualize the MNC as being embedded in internal and external business networks. These networks are defined by transfers and exchanges taking place between corporate headquarters and the subsidiaries, among the subsidiaries, and among the subsidiaries and their various business partners (i.e. customers, suppliers, and non-business actors). The analysis shows that the MNCs' main motives for global IT can be found in the headquarter-subsidiary relationship where IT enables the firm to obtain economies of scale and increased control which in turn enables the MNC to become globally oriented. The subsidiary-partner relationship, as well as other connected business relationships in the local business network, are one of the major obstacles for global IT as local responsiveness requires a level of adaptability not inherent in the context of global IT standards. The managerial challenge is to support the subsidiaries' local needs and encourage inter-subsidiary information exchange while also enhancing firm-wide coordination and intra-organizational information exchange.

Keywords: Multinational company (MNC), Information technology (IT), Headquarter control, Business relationship, Embeddedness, Case study

1. Introduction

Multinational corporations (MNCs) have been the focus of a number of studies exploring how firms develop and deploy various functional capabilities such as marketing (Hewett, Roth, and Roth, 2003), R&D (Taggart, 1997; Ambos & Schlegelmilch, 2007), technological capabilities (Zander, 1999), HRM (Youngok, 2002; McGraw, 2004), and production and product development (Yamin & Andersson, 2011). Fewer studies have focused on the IT function of the MNC (Palvia et al., 1996) despite the growing importance of IT and the increased prominence of the CIO (Groysberg, Kelly & MacDonald, 2011). Studies of MNCs and their global IT have typically investigated the fit between IT decisions and the overall strategy of the MNC using contingency approaches. Jarvenpaa & Ives (1993) analyzed MNC strategy and IT following Bartlett and Ghosal's concepts of MNCs as multinational, international, global, or transnational (Bartlett & Ghosal, 1989). They concluded that approximately half of the firms in their study sample had a fit between their strategy and their IT decisions. A lack of fit was attributed to several internal and external factors. Factors leading to a more centralized IT was e.g. senior management with a high understanding of IT, local telecommunications of good quality, good IT management support, and also when the company faced pressures to achieve economies of scale. In these situations IT could be centralized even if the MNC had a structure that logically would suggest that IT decisions be made locally. The main reason for having decentralized IT was subsidiary resistance. In those cases the MNC would decentralize IT, even if the firm was a global oriented company. The results suggest that the IT knowledge and competence of senior management at the corporate headquarter (HQ) and the quality of the local technology are drivers for the centralization of IT. On the other hand, a powerful subsidiary might hinder such development.

Another study suggested that MNC top management will demand meaningful information based upon global data and the challenge is to get standardized systems that allow this while at the same time developing IT systems that support increasingly more inter-organizational information sharing (Ives & Jarvenpaa, 1991). Subsequent work has found that the integrative and transformative effects of IT enable firms to become more transnational than multinational which in turn affects the role of IT (Stephens, 1999), that IT is a key integrative mechanism (Kim, Park, and Prescott, 2003), that IT can enhance coordination over geographical distances (Andersen & Fors, 2005), that IT changes the headquarter and subsidiary relationship so the MNC becomes more global in its orientation (Finnegan & Longaigh, 2002), and that IT strengthens the control capability of the MNC (Yamin & Sinkovics, 2007). In addition, some studies conceptualize the role of IT differently. In contrast, other work does not describe IT as a driver of centralization globalization but alternatively suggests that IT will make the MNCs' strategies (cf. Bartlett & Ghosal, 1989) blurred and that the MNCs will be more organic in their structure (Sambharya, Kumaraswamy, and Banerjee, 2005).

This study builds upon previous research on MNCs and global IT by complementing the contingency approaches (where there is an evaluation of the fit between the MNC strategy and its IT) with an examination of the underlying drivers and obstacles for global IT. A study by King & Flor (2008) showed that there is a lack of support between the MNC resource

flows and the global IT, i.e. the services and capabilities offered by the IT function wasn't in line with the organization, and they proposed further studies addressing the IT function in its business context. Jarvenpaa & Ives (1993) also proposed more process oriented studies of MNC IT. Our contribution is in two areas: *how MNCs are adopting global IT* and *why MNCs end up with the (global or local) IT they have*. Consistent with prior research that describe MNCs as networked organizations (Nohria & Ghosal, 1997), where HQ and the subsidiaries are interdependent and where the subsidiaries have to balance requests from HQ with the needs of local customers and suppliers, the MNC can be described as a federation where HQ and the subsidiaries are involved in continuous negotiations over strategy and decisions (Forsgren, Holm, and Johanson, 2005). When viewing subsidiaries as have influence on the MNC strategy of the MNC (Andersson & Pahlberg, 1998) the MNC strategy represents deliberate, long-range decisions made by HQ but is also emergent (cf. Mintzberg, 1978; Mintzberg, Ahlstrand and Lampel, 1998), i.e. MNC strategy is something *in action* (cf. Tallman, 2008). Thus, in the context of MNC, the outcome of the strategic planning process and the role that global IT will play in helping the firm achieve its strategic objectives is dependent on the various actors that select, deploy, and use the IT systems of the firm. This view of IT as dependent on the users' every-day activities has bearing in current IT research (Kling & Scacchi, 1982; Orlikowski & Iacono, 2000; Boudreau & Robey, 2005) where the implementation and use of IT is seen as embedded in every-day social and economic action and is described as an *ensemble view of technology* (Orlikowski & Iacono, 2001).

A current research stream depicts the subsidiaries as embedded through their local actions with customers, suppliers, and other non-business actors (Forsgren et al., 2005; Hadjikhani & Thilenius, 2005). For many subsidiaries these external relationships are more important to their success than internal relationships. In these instances, subsidiaries often make decisions autonomously with little influence or insight from HQ (Holm, Johanson & Thilenius, 1995; Birkinshaw, Holm, Thilenius & Arvidsson, 2000; Watson O'Donnell, 2000). Autonomy is further enhanced when subsidiaries have strong financial performance and good access to resources through their local business relationships (Nohria & Ghosal, 1997; Anderson & Forsgren, 2000). This study contributes to the current theories about MNCs as networks and expands the theoretical boundary to incorporate the MNC process of obtaining and deploying global IT.

2. Theoretical background

2.1. MNCs as a federation or a network perspective

Two central concepts can be used to describe the complexity of managing a MNC: global integration and global strategy versus local responsiveness (Nohria & Ghosal, 1997; Prahalad & Doz, 1997; Bartlett & Ghosal, 1989). IT has mainly been described as having positive effects on global integration and as an enabler of global strategy and as having negative effects on lowered local responsiveness. However, given that several studies have shown a significant discrepancy between current MNC strategy and global IT decisions, this study tries to deepen the knowledge of the specific mechanisms that drive and hinder global IT. To understand the forces affecting global IT we propose a conceptualization of the MNC as a

network (Ghoshal & Bartlett, 1990) where HQ and subsidiaries conduct business under various degrees of interdependency and coordination (Forsgren et al., 2005). Nohria & Ghoshal (1997) describe this as a 'differentiated network' where each subsidiary becomes a node that manages and utilizes a part of the MNC resources. Further they described that each 'national operating unit' is 'embedded in a unique context in which each has connections to various units outside the multinational' (page 195) and these will in turn affect the MNC resource allocation. Nohria & Ghoshal (1997) further elaborate that business transactions are influenced by economic rationale and by social embeddedness (Granovetter, 1985).

Anderson, Forsgren & Holm (2007), Forsgren et al. (2005), and Halinen and Törnroos (1998) describe a networked or federative view of MNCs. In that framework, any strategic decision is open for negotiation and potential bargaining between HQ and the subsidiaries as well as among the subsidiaries themselves. Thus, the MNC's internal organization is the setting for a perpetual power play between HQ and subsidiaries where knowledge and resources are key ingredients (Doz & Prahalad, 1981). The wider MNC network both supports and hinders the subsidiary's local actions, i.e. depending on what resources and what mandate the subsidiary is given within the MNC it will be able to act more or less autonomously of HQ (Veludo, McBeth & Purchase, 2004). Kostova & Roth (2002) describe how the distribution of roles and responsibilities across HQ and the subsidiaries can be grounded both within and outside the organization and that the subsidiary coherence is based on the trust developed within the intra-organizational network. However, they also describe that some subsidiary adaptations are 'ceremonial' which means that the subsidiary will act according to the will of HQ but mainly as a response to the formal authority (Forsgren, 2008) following the MNC's administrative and legal control system (Forsgren et al., 2005; Andersson, Björkman, and Forsgren, 2005) rather than as a genuine change. Thus, the subsidiary may follow HQ through the established line of command but without any practical impact on their local business – something that will be discussed in the section about user resistance.

The relationships between the HQ and the subsidiaries and among the subsidiaries are shaped by different factors. HQ has a natural formal authority (Forsgren, 2008) but the ability of HQ to influence a subsidiary is also a function of the knowledge HQ has about the subsidiary's local market (Holm et al., 1995). In settings where HQ has limited knowledge of the subsidiary market, it must rely on the expertise of the subsidiary to make decisions (Holm et al., 1995; Zander, 1999; Rugman & Verbeke, 2001; Andersson et al., 2005). The subsidiary in turn uses its business relationships as means to influence HQ and, if needed, its fellow subsidiaries to gain influence in the MNC (Yamin & Andersson, 2011). In many cases, subsidiaries have far more interaction with actors within their local markets than they have with either HQ or any of the other subsidiaries – a situation that affects its actions and priorities. This phenomenon, where the subsidiary is predominantly involved in business relationships with local customers, suppliers, and other actors has been described using the concept of network embeddedness (Andersson & Forsgren, 2000; Geppert & Williams, 2006; Yamin & Andersson, 2011). Andersson, Forsgren & Pedersen (2001) define embeddedness as 'economic transactions between two actors are more or less embedded in social and cultural context with mutual adaptation of the partners' perspectives, interest and resources occurring over time' (page 8). Embeddedness and the structure and importance of

companies' business relationships has been studied extensively (Johanson & Mattson, 1987; Hallén, Johanson & Seyed-Mohamed, 1994; Håkansson & Snehota, 1995; Uzzi, 1996).

However, the subsidiary will not only strive for autonomy and uphold its local responsiveness (Jarvenpaa & Ives, 1993) but it will also try to influence both headquarter and fellow subsidiaries decision making. The strategy implementation will be dependent on the power distribution between headquarter and subsidiary and sometimes 'the tail can wag the dog' (Forsgren, 2008, page 102). Yamin & Andersson (2011) emphasize the intra-organizational relationships, something they refer to as internal embeddedness, formed between the subunits as a mean of resource exchanges. The role a subsidiary takes in such intra-organizational activity can also affect its perceived importance in the eyes of HQ and the other subsidiaries (Ibid.). Thus, when trying to understand the drivers and obstacles for global IT we assume HQ will be an initiator and a major driving force for global IT but this process is reinforced by the subsidiaries where each one of them will advocate the IT or the functionality that benefits them, individually or as a group. We also assume that the subsidiaries will be resistant to global IT and this resistance will be reinforced when HQ has limited knowledge of the subsidiaries local markets. This means that in order to fully understand the drivers and obstacles for global IT, they must be studied at two levels: HQ and the subsidiary and in settings where the level of embeddedness varies.

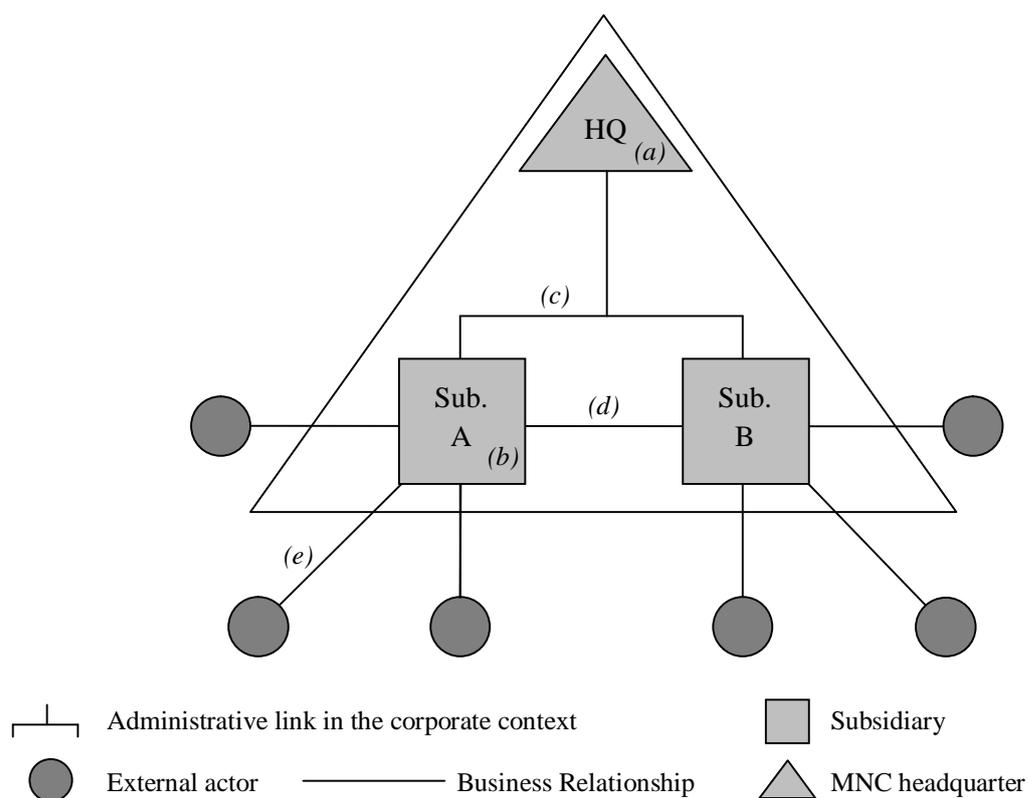


Figure 1 ó The embedded multinational (Forsgren et al., 2005; with own letter-markings)

To understand how global IT comes about the role of different MNC actors and their interdependency need to be examined. Following Forsgren et al. (2005) depiction of the

embedded multinational (see figure 1) global IT will affect (a) the headquarter, (b) the subsidiary, (c) the relationship between the headquarter and the subsidiary, and (d) the relationship between subsidiaries. In addition, research conceptualizing multinationals as embedded in local business relationships with customers, suppliers, and other partners also incorporate (e) the subsidiary-partner relationship (described as external actor).

2.2 MNCs and global IT

During the last few decades multinationals have been frequent adopters of new IT in the form of computer-based information systems such as enterprise resource planning (ERP), business intelligence (BI), and customer relationship management (CRM) systems (Davenport et al., 2006; Hawking, Foster, and Stein, 2008; Ko et al., 2008). The vendors of these IT systems promise better information for decision making with the support of seamless data transfer and information handling and the prospects of these integrated systems for large firms is that they can act quicker and become more efficient (Davenport, 2000). Many of these IT solutions are standardized commercial off the shelf (COTS) software solutions rather than in-house developed computer-based information systems. Companies are abandoning large in-house projects in favor of vendor-based solutions that are quicker to install and easier to maintain while also increasing functionality and reliability (Kiel & Tiwana, 2005). When a company selects and implements standardized IT without any customization it is described as a 'vanilla implementation' (O'Looney, 2000). IT managers do, in fact, prioritize cost over factors such as ease of use and ease of customization (Kiel & Tiwana, 2005). Thus, we can expect the MNC headquarter to act under the logic of economies of scale (Madapusi & D'Souza, 2005; Caves, 1982) by driving global IT as long as the overall strategy is international, global or transnational (Bartlett & Ghoshal, 1989). However, when viewing the MNC as a federation (Forsgren et al., 2005) global IT must be seen as the subject of a bargaining process.

The introduction of IT in business has clearly become a compelling means for MNCs to control and coordinate their MNCs (Martinez and Jarillo, 1991). IT decisions are influenced by the drive for common IT suppliers (King and Sethi, 2001). The advantage of having few IT suppliers can follow both economic and service reasons. By presenting to a vendor as a single large customer, the MNC will obtain better prices and better service. In fact, the importance of size in IT contracting is one factor that motivates some firms to outsource IT to partners that can obtain more favorable terms while providing a level of service the organization could not achieve on its own (Finlay & King, 1999). As a middle ground between centralized and decentralized IT, some firms establish multilateral linkages i.e. where local and global systems share some data, information and knowledge (Ramarapu & Lado, 1995). The management of the IT can then also be 'partially' centralized or decentralized where the latter structure would mean that some subsidiaries would act as the hub for IT knowledge, performing the role of a regional HQ (Rugman & Verbeke, 2002) or be a 'center of excellence' (Adenfelt & Lagerström, 2006). Depending on which form of IT a MNC selects, we can anticipate that the opportunities for global coordination and local responsiveness and adaptability will vary. Thus, it is possible that the drive for global IT may

come from HQ and from some subsidiaries that see a more centralized approach to IT governance as an opportunity to achieve IT services that they cannot achieve independently.

2.2.1 The IT function.

The role of the IT function within the organization is one factor that influences how companies utilize. Studies of global IT have pinpointed top management support as the single most important factor behind successful implementations (Biel, 2007). The IT function is responsible for the deployment, implementation, and maintenance of IT systems. The organization must also decide to what extent the internal IT function will be responsible for performing specific tasks and to what extent certain tasks will be outsourced. Thus, an IT organization can have a IT function spanning from being the point of contact for purchasing external IT services (i.e. a generalist) to being IT system specialists themselves (Davenport, 2000). The former is less expensive but makes the company dependent on external sources, the later offers high service levels but becomes costly. To succeed in their quest the CIO needs to consider the organizational characteristics, establish a good relationship with other executives, and understand the goals of current IT initiatives (Potter, 2003). In the context of a MNC, the CIO must further balance the business needs of HQ with the business needs of the subsidiaries. Thus, we can anticipate that when the subsidiaries have greater knowledge of their local markets than HQ, they can use that knowledge to influence CIO decisions (Andersson et al., 2007).

The subsidiary and headquarter may have different perceptions of the subsidiary's role, i.e. what Birkinshaw et al. (2000) call "perception gaps", and this causes problems when MNC wide business practices shall be implemented. CIOs for smaller companies can have a hard time keeping up with the IT development and this becomes even more complex in a global context with subsidiaries that might have different legacy systems and varying IT maturity in the different regional subsidiaries. Willcocks & Sykes (2000) stated "All too many IT functions and CIOs have not been in a sufficient prepared state to step up to the admittedly difficult business challenges represented by new technologies, increasing competitiveness, and changing ever-pressing requirements from the business" (page 34). In practice MNCs might have some IT managed centrally, e.g. the infrastructure made up of networks and servers, whilst other parts of IT as the application management and use might be handled decentralized (Kien, Soh, and Weill, 2010) or outside the MNC through outsourcing (Finlay & King, 1999).

2.2.2 IT and organizational resistance

The success of global IT is not only in the hands of the CIO and the IT department, success is also influenced by the characteristics of the MNC organization. Prior studies have found that user resistance can result in IT project failure (Kling & Scacchi, 1982; Walsham, 1993) and that users often resist standardized IT system (Askenäs & Westelius, 2003) and will even misuse systems or create workarounds (Alvarez, 2008). Loarne (2005) conducted a case study within a multinational organization and came to a similar conclusion "integrated IT influences the organization's hierarchal system but that "managers transgress procedures [stipulated by the system] in order to reach their targeted goals. That means that some

subsidiary acceptance of global IT might be what Kostova & Roth (2002) described as *ceremonial* as a mean to appease HQ.

Whilst technology issues such as data management and location of servers are solved rather easily more application specific issues, rooted in data quality and integration, are more difficult to resolve (Manwani & O'Keefe, 2003). Davenport (2002) mentions that large companies can have an abundance of meanings for a simple term like *customer* and that integrated IT systems demand one coherent definition throughout the company. This means that both data and applications become objects of arguments and negotiations. Given that most companies maintain multiple IT system, both legacy and new systems, and that their business activities have become entangled with these IT systems, this becomes a serious managerial issue. Tallon (2010) states that *[data] storage and information management more broadly, are no longer mere tactical issues that can be addressed at an operational level* and Stephens (1999) describes that there are many challenges MNCs have to face before they can achieve true global IT. Further, HQ's drive for global IT may be outmatched by the subsidiaries drive for independence and local responsiveness. Thus, it is the CIO and the IT function that must be in control of global IT which in turn can be interlinked or used in parallel with local IT. This in turn means that the subsidiaries and their end-users must respond positively to headquarter proposals as well as engage in actual use (Devaraj & Kohli, 2003) for the goals of global IT to be achieved.

2.3 IT in the embedded multinational

When viewing the MNC as a network where subsidiaries are both internally and externally embedded in relationships, the drivers and obstacles for global IT can also be expected to emanate from both HQ and the subsidiaries. When MNCs employees global IT the rationale is that 1) the common data should provide the headquarters with better data for decision making; 2) it allows a more developed global perspective and 3) it may work as a mechanism for deploying standardized business process across the subsidiaries (Finnegan & Longaigh, 2002). While HQ strives for economies of scale, increased IT service levels and increased conformity (i.e. a drive towards a global strategy) the subsidiaries will strive to maintain or increase autonomy, local responsiveness and greater control over how IT is used to support and enhance relationships within their local business network. A global IT initiative will be affected by the current strategy of the MNC, the nature of the technology (e.g. data management is associated with less resistance than standard applications) (Manwani & O'Keefe, 2003), and user acceptance. However, viewing global IT in the context of embedded relationships suggests that these relationships will also impact IT decisions of the MNC.

3. Case study approach

We conducted a multiple case study involving five European multinationals that conduct the majority of their business in foreign settings, i.e. they are highly international. Case studies are suitable when the researcher addresses questions *how?* and *why?* (Yin, 2009) and is an appropriate methodology for this study. Our selection of case was based on theoretical sampling (Dubois & Gadde, 2002; Eisenhardt & Grabher, 2007) so that we could identify

firms that fit with the networked or federative design described in prior research. We also deliberately targeted MNCs that had some ongoing work aimed at global IT, that had a long history of conducting international business, that could be considered somewhat mature regarding IT, and would give us a reasonable access. We also wanted access to a foreign market that had some degree of autonomy to be able to study the potential drivers and obstacles within the subsidiary. Studies have shown that subsidiaries that are geographically or culturally closer to HQ may implement the changes more easily, i.e. it is natural for the headquarters to be ethnocentric and subsidiaries that act under the same business logic may find the changes less stressful than the ones from other cultures and continents (Vijay et al., 2008; Anekwe et al., 2000). Thus, we considered Europe and the U.S. to be reasonably mature, yet geographically and culturally distinct markets. We initially contacted the CIOs or other high level IT management at eight European MNCs with extensive businesses in the U.S. Our assumption was that the U.S. had traditionally been a strong market which would affect the role of the subsidiary in IT decision-making and strategy ó an assumption that was confirmed by CIOs we contacted. The study was initiated during the beginning of the 2008 global economic recession, an event could presumably increase the MNCs drive for economies of scale ó and hence global IT. We asked for access to their central IT personnel at HQ and the U.S. and European subsidiaries. Seven of the eight companies agreed to participate and we ultimately acquired data from five MNCs. Two MNCs were not able to participate due to accessibility and timing constraints.

Table 1 ó Case study data

	Equipment Firm	Household Goods Firm	Component Firm	Parts Firm	Consumer Products Firm
Company data :					
- Employees	90.000	>10.000	12.000	40.000	50.000
- Net sales (Mþ)	6.000	1.500	2.500	5.500	10.000
- In no. of countries	>150	N/A	~100	>100	~150
Subsidiary studied	US head office	US regional division	US regional division	Global product division with main office in the US	US regional division
U.S .market /Europe market	30%	75%	<15%	>30%	85%
Interviews with:					
- CIO or Global IT Manager (at HQ)	1 / 120 min.	1 / 90 min.	1 / 180 min.	2 / 165 min.	4 / 275 min.
- Local/Region IT Representative	1 / 50 min.	1 / 70 min	1 ^s / 105 min.	1 / 90 min.	1 ^s / 120 min
- Local manager	1 / 120 min.	2 ^s / 105 min.	1 ^s / 105 min.	1 / 75 min	1 ^s / 50 min.
Other empirical data	Personal renderings (whiteboard), annual reports, internal company reports	Personal renderings (whiteboard), annual reports, internal company reports	Personal renderings (whiteboard), annual reports, internal documents and presentations	Personal renderings (whiteboard), annual reports, company presentations	Personal renderings (whiteboard), annual reports, company presentations

Approximate data from 2009.

^s: Interview carried out with more than one person simultaneously

European MNCs have a long history of expanding into foreign markets particularly the U.S. (Forsgren, 2008). Indeed, the U.S. market was an important market for all participating MNCs (see market size in Table 1). All of the MNCs in this study have been active in the

U.S. for decades and consistent with Stopford & Wells (1972) we expect that these subsidiaries will have a high level of autonomy. All of the MNCs in our study were mature from an IT perspective and had well developed infrastructure at the headquarters and in the U.S. subsidiaries. Within this setting we expected to be able to study the intra-organizational dynamics and learn about the U.S. subsidiaries' ongoing local business relationships and their effect on the global IT. We also interviewed some management representatives of European subsidiaries as a means to compare whether there was a difference between subsidiaries located in the same general geographic region as the HQ versus those located in the U.S.

While case studies don't offer generalizable statistical findings, they are an accepted method for theory development (Bonoma, 1986; Dubois & Gadde, 2002) and theory building (Eisenhardt and Graebner, 2007; Eisenhardt, 1989). Yin (2009) mentions that more than one case study makes the findings stronger with an upper limit of nine cases (more simultaneous cases make the analysis difficult due to the amount of data). Our selection of five cases was a balance between scope and depth. Five MNCs allowed us to observe similarities and differences between the studied companies at the same time as the contextual factors could be considered and integrated into the analysis.

The data gathering was mainly carried out as interviews, which in several cases were performed jointly by the researchers. We created one interview protocol for use with HQ and a separate interview protocol for use with the subsidiaries (see Appendices A and B for the respective interview protocols). Responses were captured through hand written notes rather than voice recordings in order to better elicit honest opinions from the respondents. Some of the respondents gave renderings 'off the record' but several of these respondents then allowed us to cross-check their information with other respondents given that 'everybody knows that this is my opinion.' One subsidiary manager even started the interview by saying 'I see this as therapy'. To minimize the risk of losing information notes were taken by each researcher. We then compared notes immediately after the interview and created a consolidated final interview report which was also reviewed by each researcher. The final interview reports were typically 6-10 pages of written text.

Case study methodology encourages multiple data collection to capture the context and get a rich description of the phenomena. Thus, we also studied formal data about the MNC (e.g. web pages, annual reports, and business magazines) prior to the interviews and we also obtained access to archival material (e.g. IT project plans, descriptions of IT architectures, etc.). The data collection started with the corporate CIO or the company's highest IT manager who in turn recommended contacts at their U.S. subsidiaries. There may have been a bias at the subsidiary level given that some respondents were expatriates with a European origin. However, these interviews were always complemented with another interview with a local representative that thereby confirmed or clarified the responses. The cases were carried out from 2008 to 2010 in an interlaced manner and the empirical findings from one case influenced the data gathering in others. The data also encouraged the ongoing literature review which is the common approach when analyzing the material following 'systematic combining' (Dubois & Gadde, 2002; Yin, 2009), i.e. the reviewing of theories are guided by the ongoing data gathering and vice versa.

4. Results and discussion

4.1. Empirical findings

All companies in the study had either some global IT systems or were in the process of acquiring some global IT systems. Three of the companies were moving towards a SAP core, Parts Firm towards a Lawson ERP solution and the Consumer Products Firm planned for a Microsoft Dynamics core. Consumer Products Firm, which was the MNC that had the most decentralized IT at the start of the study had approximately 250 IT applications running globally in 2008. All companies in the study stated that the global recession had spurred their efforts to move towards global IT in order to decrease costs. Further, outsourcing at least some IT functions was a common theme and in many cases outsourcing arrangements had been in place for many years. When the empirical material was compiled and analyzed a number of themes emerged (see table 2).

The cost issue was central as trying to get an IT that supported the MNC strategy when pushing for global IT. The same goes for the current technological trends and how the IT functions were (re)structured. However, these drivers were counterbalanced by the regional divisions need for local responsiveness and in some cases due to what could be considered organizational resistance or a poor fit with the culture of the subsidiary. The results are discussed individually in the upcoming sections.

4.1.1. Cost efficiency and flexibility

As expected, cost was a primary concern for HQ. Efforts to decrease costs took many forms, from trying to get as much as possible out of the current IT infrastructure to more efficient purchase processes (as a common PC platform, operation system, and Office software globally) to being able to deliver the IT services that the organization needed at the lowest possible cost, i.e. what we label cost efficiency (see table 2). All companies stressed the importance of financial control but this was mainly aggregated and dealt with in separate financial systems used for consolidated corporate data at HQ. Many CIOs stated that today's IT function needs to take outsourcing into consideration. Both the IT systems and IT services were evaluated from a cost efficiency standpoint and decisions were made on whether to keep the systems and services in-house or outsourced were made accordingly. However, Parts Firm's CIO also stressed that IT costs are local, i.e. there is a tough buy-in due to resistance. The subsidiary will ask 'who's going to pay the bill?' A similar picture was given by a U.S. manager at the Consumer Products as an earlier investigation showed that their local IT cost was less than 80% of the cost that the larger European home market had. Thus, a present lower local IT cost at the regional level can counterbalance the MNC's desire for global IT. There are also times when the cost efficiency can be reinforced at the subsidiary level as when a global IT will lower the subsidiaries IT costs or release them from some administrative burdens as the IT licenses.

Table 2 ó MNC drivers and obstacles for global IT (major drivers and obstacles in Bold text)

Perspective	Driver	Obstacle
Headquarter	<p>Cost efficiency IT cost ++ Financial control ++ Downsizing + Global outsourcing +</p> <p>MNC strategy Compliance and governance ++ Global functions ++ Efficient use of global inventory (+) Reduce ñnot invented hereñ effects (+) A common picture of the world (+) IT is a change agent towards the global or transnational company (+)</p> <p>IT-function and technology Global IT platform (e.g. SAP) ++ Global services (helpdesk) + Global IT auditing (+)</p> <p>Flexibility Capability +</p>	<p>IT-function and technology Cost focus (short pay-off) -- Ad hoc IT organization - Lack of knowledge/competence (-) No organizational mandate (-) Local system support (-) Diverse IT competence at subsidiaries (-) Global outsourcing partner in-houses prior (local) IT staff (-)</p> <p>MNC strategy HQ has traditionally only been a ñfinancial centerñ - Limited executive commitment - Many-to-many structure (-) No global responsible for central processes (-)</p> <p>Organizational/cultural Low organizational acceptance - No common concepts (-) Need of filters, locks, advanced user profile settings to avoid unintended IT use (-) Salesmen are considered unstructured (-)</p> <p>Cost efficiency IT costs are local (-)</p> <p>Local business networks (embeddedness) Business is considered local and too much control are believed to harm the market (-)</p>
Subsidiary	<p>MNC structure/strategy Reorganization ++ Global functions ++ Legacy IT + Strong market that ñoutnumbersñ distant (less powerful) markets +</p> <p>Cost efficiency Lowered IT costs by common IT ++ Get rid of IT license management ++</p> <p>Local Business network (embeddedness) End-customers are prioritized before sales warehouses + Product configurators makes sales easier + End-customers warranty is activated through IT applications +</p> <p>IT-function and technology Reduce extra manual work for e.g. financial reports + Internet/standardization (ñthe webñ) +</p> <p>Organizational/cultural Acquired subsidiary who wants to be included in the MNC ó</p>	<p>Local Business network (embeddedness) Different market structure or logics -- Regional laws and regulations, e.g. Brazilñ Nota Fiscal and Americañ ITAR - Strong local performance (-) Total solution or systems offerings to customer (-)</p> <p>MNC structure/strategy Legacies from M&A -- Main competence in subsidiaries - Oscillating business strategy (-)</p> <p>Organizational/cultural Low trust between different business units incl. the IT function - Soft issues and business habits (-) Business opportunities are seen as compromised (-) Subsidiary sub-optimization (-) Organizational resistance (-) Global IT causes workarounds (-)</p> <p>IT function and technology Legacy of local data and application ownership - The local IT staff becomes specialists on the local idiosyncratic IT - IT system structure and measures (-) Adaptation requirements (-)</p> <p>Cost efficiency Lower local IT cost (-)</p>

Symbols: ++ Driver seen in several cases, + Driver seen in two cases, (+) Driver seen in one case.
-- Obstacle seen in several cases, - Obstacle in two cases, (-) Obstacle in one case.

Finally, some CIOs stated that the focus on cost must be balanced against the ability to act, i.e. they recognize the need for HQ and all subsidiaries to be responsive. Equipment Firmñ CIO described the need to be cost efficient but at the same time ñready for the upturnñ and Household Goods Firmñ CIO that ñIT shall be a bit in front of the others so you are ready when the blow comes!ñ. Finally the Consumer Products Firm changed CIO and IT strategy during our study and the latter was advocating an step-wise but rather radical change to

achieve a higher degree of flexibility in parallel with striving for a common IT platform. Thus, the desire to achieve economies of scale (Madapusi & D'Souza, 2005; Jarvenpaa & Ives, 1993) is evident in all of the cases and was sometimes reinforced by cost conscious subsidiaries.

4.1.2. MNC strategy

Another strong driver was the extent to which a move towards global IT was an important element of the overall strategy of the MNC. The CIOs often depicted IT as critical to making a change towards becoming a more global oriented company. Household Goods Firm's CIO described that the subsequent IT changes often take the form of projects of operational or process-oriented character. Component Firm's CIO described that their ongoing global IT projects introduced company practices, a 'code of conduct', in line with the company strategy. He also stressed that the company has an 'aim for coordination between the companies and a unification of processes'. The MNCs in the study also cited reducing cost through more efficient planning of global inventory and the need to obtain a more comprehensive picture of the business. These findings are in line with the findings of earlier studies (Jarvenpaa & Ives, 1993; Finnegan & Longaigh, 2002) and current propositions (Yamin & Sinkovics, 2007). The drive towards global IT in support of the MNC strategy was reinforced at the subsidiaries when HQ made subsequent reorganizations of roles and responsibilities. These restructurings typically resulted in the creation of global functions (e.g. a global R&D or Marketing manager position) that, as expected, would support global IT initiatives. A local manager at the Component Firm also described a situation where he was 'outnumbered' by representatives from HQ and other business division managers when the firm decided to adopt a new ERP system. Thus, we can assume that the 'internal embeddedness' (Yamin & Andersson, 2011) and the 'power play' expected in networked MNCs (Forsgren et al., 2005) are factors in the implicit negotiation inherent in global IT decisions.

The strategy of the MNC was also occasionally an obstacle. In situations where the subsidiaries had a long history of making decisions autonomously, e.g. HQ had a history of acting as a mere financial center (as at the Consumer Products Firm) or where the different business areas have had a high degree of autonomy (as at the Component Firm), it was difficult to move towards global IT. One CIO also mentioned that the potential of global IT couldn't be realized because there was a complete lack of global functions (i.e. the opposite situation to the cases where the MNC had e.g. a global R&D manager or global Marketing manager). These obstacles were also reinforced at the subsidiary level where several MNCs had a legacy of autonomous U.S. business divisions which meant that the major business knowledge resided in the subsidiary. However, the major difficulty was probably the legacy IT systems that came with frequent acquisitions. An expatriate that worked with a current IT migration at the U.S. Equipment Firm pinpointed that it would be good to have some form of general template on how to integrate newly acquired companies quickly. Finally there were also respondents that had seen less successful change efforts before. The U.S. manager at Consumer Products Firm described that he thought his company had an oscillating business strategy the last decade and made him skeptical of the global IT initiative.

4.1.4. IT-function and technology

The companies were, as earlier mentioned, in the process of unifying and streamlining several IT systems, i.e. they were all engaged in a quest for global IT even though some MNCs would leave some IT systems locally. One of the MNCs was beginning this process (Consumer Products Firm) and another MNC estimated that more than 70% of the global IT systems were up and running (Equipment Firm). Thus, all of the MNCs in this study were moving towards global IT platform based on SAP, Microsoft or Lawson and all were in the process of establishing some global IT services. In some cases, the global IT services were created in parallel with IT services at the subsidiaries. In these cases, the subsidiaries IT staff had become specialized on their local IT systems and those systems could not be support by global services. In that sense, a formerly decentralized IT strategy is in itself an obstacle to adopting global IT systems and services. However, Household Goods Firm had a strict global IT audit that involved weekly interaction with local IT managers as well as a yearly assessment. This was an activity that helped the MNC to become more unified and global orientation.

Even though all of the MNCs in the study were striving to implement at least some global IT systems, there were a number of obstacles originated from corporate HQ. One was that the IT function was expected to show a quick return on investment (ROI). Many of the structural changes that need to be done to achieve global IT do not achieve positive ROI over a period of months. Rather it can take years for these ventures to break even and provide a return on the initial investment. This expectation made it challenging to obtain high level support for expensive IT initiatives. Other obstacles included an IT function that hasn't followed the structural changes of the MNC, where they have a low acceptance in the MNC, or when their competence is perceived as inadequate (as described by Willkocks & Sykes, 2000). During the study two of the five CIOs were replaced. One of the MNCs had an interim CIO picked from their internal IT department while they recruited a new CIO and the other MNC hired a former consultant that had presented an IT change plan that would allow the company to become more globally oriented. There are also drivers for global IT at the subsidiary level. For example, when global IT enables the subsidiary to improve productivity (as e.g. automatic financial reporting instead of manual routines) or when technology requirements from local business partners (such as compatibility with web-based systems) can't be met with existing local IT systems.

Other technical requirements can serve as obstacles to global IT. For example, an ERP system needs a master data based upon one currency (e.g. Euro versus Dollar) and one system of measurements (e.g. metric versus U.S. standard). A general lack of IT savvy can also be an obstacle. A U.S. manager at the Component Firm mentioned it would be an advantage to have voice over Internet protocol (VOIP) because it saves on telephone costs and facilitates integration with the customer service system. This enables customer information to be displayed as soon as the customer makes contact with the service representative. However, HQ was completely unaware that this additional benefit to VOIP existed. The same manager also stated that HQ sometimes has little knowledge about the local market with respect to routine business functions such as ordering and payment

routines. This lack of understanding results in additional IT costs as global IT systems mandated by HQ must be reprogrammed to support local operations that are outside the subsidiaries ability to control (i.e. a form of local adaptation, see e.g. Håkansson & Snehota, 1995). A manager at Parts Firm's U.S. division also described technological obstacles for global IT. Many of their major customers were Fortune 500 companies and they had already established customized electronic data interchange (EDI) connections. These systems were not easy to replace because the powerful and important customers preferred the existing arrangement and had little incentive to comply with a mandate from the HQ of Parts Firm. In that particular case, changes associated with the global IT initiative actually made it harder to do business. The manager stated "We use to jump over backwards to accommodate the customers and the new system made that level of service impossible. This view was also shared by the Consumer Products Firm.

4.1.3. Local business network (embeddedness)

As expected, local business relationships and the business procedures that had been developed in collaboration with the local partners represented major obstacles for global IT. All of the subsidiaries in this study had historically operated as fairly autonomous business units now they were being transitioned by HQ towards a more transnational or global company. A host of obstacles emerged that related to market differences such as; different products in different markets, built to order versus built to stock, standard orders versus customer specific orders, different local or regional product requirements, or different service levels, i.e. there was a general need for local adaptations and local responsiveness (Bartlett & Ghoshal, 1989; Hallén, Johanson and Seyed-Mohamed, 1994; Håkansson & Snehota, 1995; Forsgren et al., 2005). These obstacles were acknowledged by HQ. One CIO stated "At the end of the day, all sales are local [which means that] too much control can harm the market". The CIO at Component Firm, which was divided into three rather autonomous but global business areas, stated "business is domestic". However, the obstacle for global IT based upon the local business relationships, i.e. the external embeddedness (Yamin & Andersson, 2011), could also be seen as a driver for global IT if the move enhanced the subsidiary's ability to interact with local business partners and customers. One example was an IT system that contained functionality that enabled customer orders to be processed before warehouse orders i.e. local customers would be prioritized. Another example was when the global IT provided new functionality that made business easier (e.g. good product configurations). Global IT was also easier to adopt if it supported customer activities (e.g. a customer could access the global IT system to activate their product warranty, thereby removing the subsidiary from the warranty activation process altogether).

4.1.5. Organizational/cultural factors

Organizational structure and culture also emerged as a major obstacle to the adoption of global IT systems. For example, the Component Firm noticed that there was little trust between their different units and that led to a situation where regional sales units would add two extra weeks for delivery because they did not believe the manufacturing plants would be able to deliver on time. That resulted in a great deal of waste in the supply chain manifesting as unnecessary storage and unused capital. At the same time, the subsidiaries could also miss

the "big picture". In one case, a subsidiary felt it had a more effective IT system because it only took 10 minutes to create an order versus 20 minutes for the new global ordering system. What the subsidiary did not see was the overall reduction in the amount of time required to fulfill the order, which includes many more steps beyond order creation. Other "soft issues" emerged that were not evident to HQ. A regional manager can e.g. get benefits in a local club or a community based upon a specific managerial position. If that position needs to be changed due to restructuring that person can lose that position in the community. Thus, he or she will do anything to keep the current position. Another cultural factor was variance among the training and status of similar roles across the subsidiaries. One U.S. subsidiary used highly educated sales representatives to sell their products while the European subsidiary employed salespeople with less education and training. Salespeople in the U.S. were compensated based on commission and enjoyed relatively high status within the subsidiary. European salesmen were placed on salary and were not perceived to be as important to the success of the subsidiary. This difference became a problem when the firm discussed adopting a common CRM system – the U.S. representatives did not like the proposed solution while the European representatives thought it was a good solution. In addition, one CIO mentioned that local business culture might hinder unified data. He gave their new market in China as an example. He would not put an open CRM system in the hands of their Chinese salesmen because they were poorly compensated and data security was a big concern – a salesman could move to a competitor to obtain an increase in pay and take the customer data with them.

4.2 Implications for global IT

When summarizing the obstacles and drivers it is evident that global IT systems and services are not completely under the managerial fiat of corporate HQ. Rather they are the subject of negotiation and power play (Forsgren et al., 2005) just as any other core business function in the MNC setting. We have also noted that many of the factors we considered have a dual nature and can be either drivers or obstacles of change, depending on the circumstances. The different forces may also be more or less evident over time, i.e. the affecting forces (see table 2) are in action simultaneously and it is the most powerful force will ultimately drive global IT decisions.

It is also worth mentioning that the inter-subsidary relationship has few driving forces and few obstacles given that these relationships are less strong than the headquarter-subsidary relationship. One possible explanation for this finding is that most of the companies in this study had a history of relatively autonomous regional business units. However, some re-organizations had resulted in increased subsidiary to subsidiary information exchanges as well as global IT solutions.

5. Conclusion

In this paper we presented a multiple case study to explore the specific drivers and obstacles associated with the deployment of global IT systems and services in the context of MNCs with multiple, geographically dispersed subsidiaries. Our findings support prior studies that found cost is a major driver for global IT and that the strength of cost as a driver has at least transiently increased as a result of the most recent global recession.

By adopting a networked view of MNCs ó where the multinational is depicted as a federation involved in an ongoing bargaining process between headquarter and subsidiaries and between the subsidiaries themselves (Forsgren et al., 2005; Forsgren et al., 2007) ó we also found that major obstacles reside in the embeddedness of the subsidiary. This embeddedness, which takes the form of the subsidiary's long-standing relationships with customers and suppliers, influences decisions regarding IT systems and services. Prior IT research that puts forth organizational resistance as central for implementation failures (Askenäs & Westelius, 2003; Loarne, 2005; Alvares, 2008) needs to be expanded to further explore the impact of external (interorganizational) forces. Furthermore, MNC studies on technological development, marketing, and procurement adaptations (Zander, 1999; Hewett et al., 2007; Yamin & Andersson, 2011) as a source of subsidiary influence needs should be complemented with more studies of subsidiary influence over global IT. In this study we find that the factors that most strongly influence global IT decisions have a dual character, i.e. they can be both drivers and obstacles depending on the circumstances.

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Appendix A. Headquarter interview protocol

- a. General company description
 - b. Organization [MNC] structure
1. What are the strategy and goals for the company as a multi-national corporation (MNC)?
 2. What challenges does the company face in achieving its strategy and goals?
 3. How does the company work to address these challenges [using organizational structure, IT systems, business process changes]?
 4. How does the company evaluate the success/failure of its initiatives [organizational, IT, business process, etc. and with what kind of metrics]?
 5. From the perspective of [firm name] what is the desired relationship between headquarters and subsidiaries (i.e. other organizational units)?
 6. What type of information needs to be exchanged between headquarter and subsidiaries to establish and maintain this relationship?
 7. Do headquarter and subsidiaries share a common view on the desired relationship and the need for information exchange?
 8. Are there barriers to a common view and/or information exchange? If so, what are the barriers? How is the company working to overcome the barriers?
 9. How do the subsidiaries in different markets affect the IT infrastructure and the applications (if so; do you have practical examples of something that you have considered)?

Appendix B. Subsidiary interview protocol

1. Which of the functions listed below are performed at the subsidiary level? Are the associated business processes unique to the subsidiary, or are the processes based on HQ directives? - R&D/product design - Procurement - Production/manufacturing - Marketing/advertising - Sales - Service/aftermarket - IT/IS - Finance/accounting - HR - Other key functions supported by IT/IS
 2. Please briefly describe the current IT/IS at the subsidiary level. - Number of IT/IS users - Desktop environment - Network/intranet - Data center ó ERP system ó Procurement - Supply chain management - Warehousing/distribution ó CRM system - Electronic commerce - Major initiatives underway - Other important IT/IS. Follow-up: To perform a thorough analysis, we would appreciate a more detailed understanding of the major applications in use at the subsidiary, and the current and desired state of interoperability. We are interested to understand more about how these applications integrate internally and with the corresponding applications at HQ and other subsidiaries. If you are comfortable to provide this information, we will send you some evaluation tools to streamline the information gathering process.
 3. What are the general strategy and goals for the subsidiary? How are these related to the firm's global strategy? How does the IT/IS function support the subsidiary's goals?
 4. From the subsidiary's perspective, what is the desired relationship between the subsidiary and HQ?
 5. What type of information is exchanged with HQ? What type of information is exchanged with other subsidiaries? Are there any barriers for information exchange, and if so, how does the subsidiary work to overcome these barriers?
 6. Are there any local market aspects that have had a great impact on the current IT/IS state? Are there any corporate functions (see list under question 1 above) that present unique requirements for the current IT/IS state?
 7. Where are the majority of high-level IT/IS decisions made ó at the subsidiary or at HQ? What role does your position play to define the information and application architecture? To what extent do IT/IS and executive leadership in other areas collaborate to define architecture and application strategy and implementation?
 8. Are there any other questions we should have asked during this conversation to better understand the current and future state of IT/IS at the subsidiary?
- a. Other notes, follow-up questions
 - b. Rich Picture