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A Study of Emerging Multi-cultural and Multi-national Issues in Enterprise System Adoption Processes

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ABSTRACT
Previous research has documented that introduction of enterprise systems (ES) is a major undertaking in organizations. Multinational ES implementation adds new dimensions of complexity due to national, cultural, organizational, and technical differences. The paper reports from an ongoing case study on ES deployment in a multinational engineering company, operating in a highly competitive and global industry. The findings illustrate the complexity of multinational ES implementations and how ES is constrained by an installed base of information, systems, organizational structures and practices at various geographical locations, which also evolves over time. The case study exemplifies the need of a long-term perspective on change processes in a multinational context. The findings suggest a need for flexibility built in IS solutions and processes while simultaneously maintaining necessary IT governance, such as establishing an IS governance model with global process owners, information managers and super users actively involved in discussion and negotiation of changes.

Keywords
Multinational ES implementation, IS change, global business processes, case study

INTRODUCTION
Implementation of global business processes is a key concern in multinational corporations today, to enable collaboration and coordination of activities across organizational and geographical borders. There is an increasing focus on improvement of both local and cross-border business processes to keep pace with changing business environment and global competition (Doomun and Jungum, 2008). Typically, large-scale information systems such as enterprise systems (ES) are implemented to enable integration and coordination of business processes within the company and with business partners (Biehl, 2007). ES have been acclaimed in literature for their potential to improve business performance, and companies worldwide have invested heavily in ES. However, introduction of ES in organizations is a major undertaking that usually requires considerable organizational change. Multinational ES implementation adds new dimensions of complexity due to national, cultural, organizational, and technical differences (Scheu, Chae and Yang, 2004). Research studies have demonstrated that introducing ES in global organizations often have unintended consequences and do not necessary fit in local contexts (Hanseth, Ciborra, and Braa, 2001). More empirical research studies are needed on how corporations manage multinational ES deployment, balancing between often conflicting interests from different stakeholders (Davenport, 2004), and between local and global needs. Globalization of business processes implies that different organizational units need to be coordinated and integrated across geographical and organizational boundaries.

The aim of the paper is to explore emergent issues that occur when introducing ES in a multinational corporation (MNC) and how these are dealt with. The empirical basis is an ongoing case study in a MNC that is a provider of high-tech product and services for the oil and gas industry. The MNC is a part of a global group of companies and the case study explores the phenomenon from the perspective of both the headquarters as well as the subsidiaries in other parts of the world.

The remainder of this paper is organized as follows. The next section gives a brief description of related research. The third section presents the research methodology and introduces the case setting. This is followed by findings identified during first phases of the case study in TPS in section four and discussion of main findings in section five. Finally, the last section provides conclusions and suggestions for further research.

RELATED RESEARCH
Information integration is reported to be a key benefit of ES, which can replace complex and sometimes manual interfaces between different applications. Other advantages often mentioned are that order circle can be reduced, enhanced operational and business planning since all planning levels are based on the same data collected once, thus facilitate the governance of the company (Scott and Vessey, 2000). However, ES are complex pieces of software and many such implementations run
over time and budget and have failed to achieve their business objectives (Hong and Kim, 2002). Multinational ES implementations projects typically experience unplanned challenges and events, which may lead to major restructuring of the process (Biehl, 2007). Scheu et al. (2004) found that national differences such as language, politics and government regulations, and organizational differences such as various management style and labor skills were important factors for multinational ES success.

The majority of previous studies have adopted a variance approach, typically describing critical success factors for ES implementation (e.g. Ngai, Law and Wat, 2008; Somers and Nelson, 2001; Plant and Willcocks, 2007). Other studies apply a process perspective, focusing on how change develops over time in a sequence of stages. For example, Markus and Tanis (2001) describe four phases for ES implementation; Project chartering: The project phase, Shakedown, and Onward and upward, as illustrated in figure 1.

![Figure 1. Stage model with phases of the enterprise system experience cycle (Source: Markus and Tanis, 2001, p. 189).](image)

The paper explores emerging issues related to phase 2 and 3 in what the authors refer to as “ideal” phases. However, previous research have demonstrated that multinational ES implementation projects typically tend to be of an evolving nature, with strong elements of improvisation (Boudreau and Robey, 2005; Ciborra, 2000) and high costs. Some studies report unintended side-effects of the implementation and a tendency to drift from initial plans (Hanseth et al., 2001). Local needs must be weighted in relation to a common infrastructure, which requires gradual design through iterative processes of negotiation. Some researchers have emphasized the impossibility of large-scale systems to be universal across contexts due to local relevance or cultural fit (Hanseth et al., 2006). There has been a steady increase in IS research exploring contextual aspects on how technology is developed and used (Avgerou and Ciborra, 2004).

**RESEARCH METHODOLOGY**

**Research approach**

A case study approach is well suited to examine complex social phenomena in a real-life setting by analyzing experiences and perspectives of participants on the issues under study (Flick, 2007). Case studies are often used to study phenomena within a context where the boundaries between the two are not clearly evident (Yin, 2002) and can be used when studying current setting or past events. A qualitative case study was considered appropriate to explore evolvement of global business processes and ES in an international setting. Interpretive research is characterized as research in which phenomena are understood through accessing the meanings that the participants assign to them (Klein and Myers, 1999). The research is interpretive in nature, aiming to develop an increased understanding of the context in which the ES is deployed, how it
influences and is influenced by this particular context (Walsham, 2006), and how processes were perceived by the participants.

Case setting

The case study is conducted in a multinational engineering company in the oil and gas industry, here referred to as TPS. The company was chosen based on main criteria set by the research objectives. TPS is a global provider of high-tech engineering products and services for the oil and gas industry and part of a larger global engineering group with approximately 23,000 employees worldwide. TPS operates from corporate headquarters, subsidiaries and local offices located in America, Asia, and Europe. The company has recently experienced a large growth and increasing global operations. An enterprise system was implemented in TPS’ headquarters in 2005 and later rolled out to the subsidiaries over a period of four years, aiming to support and standardize back office activities and integration of international operations and activities. SAP modules for customer service, logistics/supply chain management, finance, HR and travel management were implemented in the first round. The company decided to rollout a standard solution that should fit different locations with minimum customization.

The focal business process explored in this paper is the global customer service process. Typically, a project starts with engineering at headquarters or one subsidiary, followed by production by global suppliers, and after services services from the customer service office in the respective region and the headquarters with service engineers from different regions. The process is characterized by extensive collaboration between different business units, companies and people of different nationalities. The ES is continuously evolving to support changing needs of global operations.

Empirical data collection and data analysis

The findings reported are based on 30 interviews conducted during January 2008 – September 2009. The first interviews were open, in-dept conversations aiming to understand the particular industry and history of the firm. The latter were semi-structured interviews with informants that have been involved in deployment of global IS and business processes, including managers at the TPS headquarters and local offices, global process owners, super users and employees involved in the global customer service process. The combination of semi-structured and open-ended questions made it possible to follow up interesting issues that emerged. The informants, who are located at four sites in America, Asia and Europe, were encouraged to describe their experiences with and perceived outcome of the ES related to collaboration on local and global business processes within their functional area. All interviews were recorded and transcribed. Additionally, observations from three workshops and meetings related to the customer service process were conducted, providing important contextual information about the process, information systems and people involved. The third empirical data source includes secondary material such as project descriptions, process models and presentations.

The data analysis proceeded in an iterative way between reading and interpreting interview transcripts, field notes and secondary materials, theory and related research. Previous empirical research on global IS is used to guide the research study, thus iteratively linking theory and data. This process resembles the principle of hermeneutic circle (Klein and Myers, 1999), with the interviews being analyzed in several iterations. Themes and categories were developed through the iterative data analysis of the interviews (Miles and Huberman, 1994). Atlas.ti was used for coding and categorizing empirical data.

FINDINGS

In the following, some challenges and experiences during implementation of CS module are described. The paper reports from an ongoing case study, the findings are thus explorative.

Evolvement of global ES and business processes

Balancing between global standards and the need for local adaptation and fast changes to support innovative work is an issue. There is an ongoing debate in the company on balancing the need for niche applications and standardized applications. This has become even more actualized with the global expansion and need of cross-border collaboration. The informants argue that adoption of an ES across the different locations, enabling global collaboration and coordination is vital for effective global expansion and a main reason for further investment in the ES. With delivery of large installation projects and services that require extended global cooperation, the need for global ES support in the customer services process has been actualized. Several of the informants argue that the MNC has reached the point where they are very dependant of a global ES solution for effective global operation. The service engineers need to know as much as possible about the service job, the equipment, and drawings and historical data are important. Access to global application support and local knowledge about the system is another important issue. This can be a challenge with niche, in-house developed applications.
Capability building

During the implementation process the global implementation team was central, and their capability consisted of knowledge, experience, and skills from ES implementation. However, there was limited business and process knowledge in team of consultants. The empirical findings demonstrate a need to overcome knowledge barriers related to utilization of the enterprise system and business processes across functional and national borders. The global company has a heterogeneous work force with differences in age, professional and educational background, previous experience with IT applications and process knowledge. The multinational ES implementation was reported to be an innovation in many respects, as some employees have changed from working on paper notes to register everything in a corporate-wide system, which was a major change.

One informant who was actively involved in change management in ES implementation project commented how the new global ES made work more transparent. Job design, job enlargement and job simplification have been activities to deal with these challenges. The ES should integrate information about products and processes across functional and national borders. The informants described how deployment of an ES at headquarters and subsidiaries revealed diverse practices and process skills at different departments and locations. For example, the managers and employees had to acquire new functional and technical knowledge about the ES and new business processes. Development of global business processes was described as processes of combining old memory and new knowledge.

Important initiatives for overcoming knowledge barriers were training and courses during implementation, conducted by the project team and external consultants and updating courses offered as e-learning or classroom training. However, the informants emphasized the need of arenas such as online discussion group for discussion and knowledge transfer to develop a common understanding and improvement of the global ES and global business processes. Easy accessible guidelines and training material, highlighting regional differences, were available on corporate portals.

Communication and coordination processes

A central job for the customer responsible is coordination of service activities and documentation flow such as technical product information and history of service jobs. One of the project managers argues that there is a need of more formal communication and documentation as there is an extended use of e-mail, which could be problematic when communicating with service engineers that are working shifts. A document management implementation project has been initiated and is an example of extending the ES. The company operates in a highly competitive and dynamic industry and the ES has to adapt to changing conditions. The company is therefore continuously working on improvement of the IS portfolio and several improvement initiatives are launched. TPS was the first company within the group installing the customer service (CS) module in SAP. Therefore, little “best practice” procedures for the group were available. According to the informants, efficient collaboration on the CS process between the headquarters and subsidiaries, and across subsidiaries, is dependant on common routines and procedures describing use of ES supporting the global CS process. Establishing online knowledge networks in which the procedures, challenges and solutions could be discussed are regarded important.

Cultural diversity

During recent years the company has experienced large growth through organic growth and mergers. The heterogeneous nature of the company, consisting of engineers and managers with different national and educational background, was simultaneously seen as a challenge and opportunity. The global dimension adds complexity and challenges. Some differences in power relations and responsibilities were uncovered in the case when defining user roles with corresponded responsibilities and access. Initially, the ERP system was configured for the need of the headquarters. During rollout definition of roles and responsibility was accepted in one the US subsidiaries, which has more restricted procedures on who was allowed to approve economic transactions in the system. Thus, there was a need for customization of definition of roles and routines to the US context.

The core activities of the companies are often project driven and the informants emphasize that cross-functional cooperation and communication are crucial for developing and maintaining global business processes. Cultural diversity such as differences in national culture has influenced the collaboration process, for example when discussing and modeling new business processes. However, several informants also emphasized the opportunities when combining resources and capabilities across the MNC, facilitated by the ES.
Governance of global business processes and ES

Governance and ownership of global business processes are stated as critical factors by several informants. Dedicated global process owners were appointed during roll-out to subsidiaries, and these persons became central in process mapping and modeling during roll-out and post-implementation activities to harmonize the global business processes. The global process owners and super users have played an active role in workshops at the subsidiaries and in training and encouraging utilization of the CS module for enhanced collaboration on customer service. A common system foundation is regarded essential for collaboration across different business units but also emphasizes the need of establishing a unified way of using the system. One of the project managers described establishment of the governance model as a crucial part of ES deployment: “And the most important of all is to get the governance model in place. That one gets these roles established, with people with the right responsibility and qualifications. It is this network and this collaboration with both the business area and the process owners, you have super users, and you have application managers who should maintain and manage the solutions. It’s a mutual relationship, where no one can operate alone.”

The global ES and business processes needed to be further improved and changed through negotiation between different stakeholders and there was a need for an arena for discussions and decisions, and prioritizing improvement. Thus, an improvement network for cross-border communication and prioritization of IS improvement and process networks was established with top management group as steering committee. This seems to have provided an important arena for cooperation on global business processes and related IS solutions.

More transparent knowledge processes

Increasing global operations and managing a company that has more than doubled in few years is a tremendous change for the company, also when it comes to cross-border collaboration. Proceeding from being a local company with some international installations to becoming increasingly more global with representations and subsidiaries in several countries was characterized as a large change and a learning process at different levels; for managers, process owners, project teams and other employees. According to one of the IT/IS managers, knowledge sharing and collaboration is something that needs to be learned and encouraged in the MNC: “One big challenge is to make people learn to share, both knowledge and work by working together. Sometimes, when sharing knowledge, it may feels like giving away some power. And we have seen this in relationship between headquarter and subsidiaries. In many ways, enterprise systems like SAP have given us an opportunity to balance more between subsidiary and head office. Because you have to relate to common rules. This relates to transparency. If the monthly settlement is not finished, this has a direct consequence, because everything is connected”.

DISCUSSION

Learning and alignment of global and local needs

The case illustrates that the global IS does not develop in isolation and deployment of the enterprise system is constrained by an installed base of information, systems, artifacts, organizational structures and practices, which also evolves over time (Avergerou and Ciborra, 2004). Learning and enhanced knowledge of business processes and the supporting IT/IS is critical, for example a better understanding of how functions and structures in a global information system relate to local and global processes. User training was necessary during all phases as ongoing skills enhancements seem to represent an important post-implementation behavior that is needed for maximizing utilization of the systems.

Implementation of the global ES has been a corporate decision and centrally managed projects. Simultaneously, local needs have initiated changes in ES configuration and related applications. A combination of a centrally managed and locally adapted approach was thus necessary and a flexibility that supports local infrastructure and needs should be built into the global IS infrastructure.

IT governance

The particular context in which the global company operates was essential for development of global business processes and implementation of ES (Avergerou and Ciborra, 2004). The case company delivers products and services on both new oil rigs and rigs in operation. Thus, a small-steps approach was considered necessary in further development of IS infrastructure.

The case also illustrates the importance of establishing a global IT/IS governance model in complex networks as a global group of companies. The governance model was regarded essential for the success of the ES implementation, but not at least for further development of global IS and global business processes. The MNC has established some initiatives that the
informants emphasize as important for governance and support, for example by appointing global process owners, super users and application responsible. Information manager roles were established to enhance information logistics in projects and CS, and an improvement network for prioritizing improvements across business units and functions has been a significant tool for enhanced cross-border collaboration and knowledge transfer. Establishing an appropriate and effective support organization for the global IS infrastructure is challenging and need to be managed (Biehl, 2007). The need of local presence is emphasized from the subsidiaries, which are more critical to the shared service model than the headquarters.

The mediating role of MNCs in glocal concern

Moving from being a national company with some offices in other countries to becoming increasingly international has been a learning process at several levels of the organization. The case study illustrates the mediating role of the head office, which has to relate to the global concern and the shared service model, the needs of the MNC as a whole and the needs of the local offices. This influences both IT strategies and deployment of the ES. A network for CIOs within the group for strategy discussions, exchange of knowledge and experiences, and harmonizing strategic IT decisions across the group was needed. This is an area that has not been enough explored in existing literature, and will be an interesting area for further research in the longitudinal study.

CONCLUSIONS AND FURTHER RESEARCH

The paper reports from an ongoing research study, and finding presented earlier and conclusions drawn in this section are based on empirical data from interviews from the first phases of the longitudinal case study. However, the findings illustrate the complexity of multinational ES implementations. The study of a MNC with increasing global operations demonstrates a need to continuously examine and improve global business processes and large-scale IS. There is a need of built in flexibility in processes and IS solutions while simultaneously maintaining necessary IT governance. For example, establishing an IS governance model was regarded critical for the ES implementation and further improvement of global business processes. Moreover, the findings illustrate the significance of contextual aspects on how technology is developed and used (Avegrerou and Ciborra, 2004). The complexity of multinational ES deployment in a heterogeneous organization demonstrates the need of a long-term perspective on change management in a global context.

A particular contribution from the study is that it explores the change processes from both the headquarters’ and subsidiary’s view point and look at continuous improvements in a heterogeneous context. Our qualitative research study has identified several areas for further research. The mediating role of the MNC in ES deployment will be further explored. There is also a need of more empirical data related to side effects and costs of ES for the various business units. Diversity within the MNC suggests a need for further exploration of the adaptation process at local offices, e.g. accepting global solutions decided by the headquarters, and how local adaptations affect development of the global IS.

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