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Critical Success Conditions for Enterprise Systems Change Projects

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ABSTRACT

Enterprise systems are configurable and customized computer-based information systems, claiming to provide a total, integrated solution to firms' information-processing needs. 'Management support', 'User Involvement', and 'Project Management Experience' are considered as three of the most important critical success conditions for Enterprise systems change projects. The main purpose of this paper is to identify and discuss new preconditions for established critical success conditions in Enterprise systems change projects. Traditional Enterprise systems technology and traditional plan-driven project management methods are not in an effective way supporting the established critical success conditions for Enterprise systems change projects. Supported by the findings from one case study, we propose that new preconditions, such as modern Enterprise systems technology, more narrowly defined projects and agile methods are matching each other. We also propose that this combination of new preconditions is more appropriate for supporting the realization of critical success conditions for Enterprise systems change projects.

Keywords

Enterprise systems, critical success conditions, enterprise systems change, project management, agile methods, web-based enterprise systems, sales portals, sales order processes.

ENTERPRISE SYSTEMS AND TRADITIONAL PROJECT MANAGEMENT

Enterprise Systems

Today there is a booming market for software packages claiming to provide a total, integrated solution to firms' information-processing needs. Enterprise systems (ESs) are standardized computer-based information systems for enterprise integration, internally as well as externally. ESs can be customized in principally two ways: traditional parameter-driven systems or the new type of systems built up by a user-friendly application generator. ESs are characterized as all-embracing administrative information provision in organizations supporting the integration of business processes through shared information flows (cf. Shanks and Seddon, 2000). The integration of core business processes, for example accounting, order management, logistics and human resources, is achieved through creation of a single system with a shared database.

Over the past fifteen years many large and SME organizations have adopted ESs expecting positive outcomes. Many of these firms are now upgrading, replacing, or extending their original ESs, facing major technical and organizational challenges. The reason is argued to be that the traditional ESs are monoliths with complicated code bases, which make it difficult to design solutions meeting the needs of the individual firm. It is not either possible to pick just one improvement that the customer wants from an upgrade and skip the other. Vendors of traditional ESs are aware of the growing dissatisfaction among its users, who are forced to work in inefficient ways, hire expensive consultants to manage the systems, and to perform Big Bang upgrades causing lots of disruption and cost.

Traditional Project Management

The project management methods applied to handle most IT projects, could be denoted as 'traditional' and originate from the large development projects carried out during the forties-fifties within the U.S. military industry. These traditional methods feature extensive upfront planning as the basis for predictions, measurements and control during the project life cycle (Nerur et al., 2005). Traditional project management is often denoted as 'plan-driven' or 'stage-gate' project management.

Projects are generally defined as non-recurrent assignments with well-defined goals, time-limit and budget – but there is a wide range of project types, requiring a wide range of management methods. Still, most projects are managed by the traditional principles using the same methods, usually without further reflection, even in small projects of short duration (Nilsson, 2008). Thus, the organizational learning within software development has been focused on reducing variance and on increasing process repeatability and control (Lyytinen and Rose, 2006) often by implementing quality systems as CMM (Humphrey, 1989). Despite these efforts, software development has not been consistently successful, thus often resulting in delayed or abandoned software projects. Extensive research has proven that traditional project management methods are insufficient for project success within software development. The Standish Group International (2001) found that only 28% of 280,000 surveyed software development projects were perceived as successful.

CRITICAL SUCCESS CONDITIONS FOR ENTERPRISE SYSTEMS CHANGE

In this paper, 'ES change' denotes the two mutually interdependent ES development and ES implementation processes. The perceived need for improvements regarding ES change, and the common view that all IT projects deal with the same problems and opportunities, has inspired researchers and practitioners in the search of the most important factors deciding failure or success in IT projects. The Critical Success Factor (CSF) approach was originally suggested by Rockart (1979). A CSF indicates what has to be managed correctly to achieve successful results.

There exists an established and acknowledged set of CFSs for ES change projects. The Standish Group International study (2001), surveyed the strength of influences from different factors on project success. The five most important CSFs were 'Management support', 'User Involvement', 'Experienced Project Manager', 'Clear Business Objectives' and 'Minimized Scope'.

Other researchers (eg., Soh and Markus, 1995) advocate process theory models, which contain arguments of the type "necessary, but not sufficient" conditions to realize effects as a result of the adoption and use of an IT artifact. A process theory maintains that the outcome will only occur under the circumstances specified by the theory. At the same time a process theory states that the outcome may not occur even if all the specified prerequisites, or conditions, are in place (Mohr, 1982). Acknowledging the dynamic contexts for ES development and ES implementation processes, we therefore in this paper use the process theory concept Critical Success Condition (CSC) instead of the variance theory concept Critical Success Factor.

CHANGING PRECONDITIONS

The ES change context is far from stable. There have been continuous changes in technology, software development methods, application areas, management techniques, etc, during the entire era of software development (Boehm, 2006). During the last decade, these changes have altered the preconditions for ES change projects, and also the possibilities for the acknowledged CSCs to be realized.

Modern Technology – a Paradigm Shift from Tightly to Loosely Coupled Enterprise Systems

The current movement to Service Orientation is indicating an era of enterprise computing based on open standards, Service Oriented Architecture (SOA), and optimized business processes. SOA is a style of enterprise architecture that enables the creation of applications and processes, built by combining interoperable services in a loosely coupled fashion. These services interoperate based on a formal definition, independent from the underlying resources and programming language. SOA offers more flexibility, lower costs and increased productivity (ComActivity, 2008), and enables the firm to make itself free from hard coded, heterogeneous, difficult to integrate and fragmented applications (Björkman, 2008b). Furthermore, Internet technology has turned out to be a good environment for development in real time, allowing collaboration in teams around the clock and around the world (Aoyama, 1998). This indicates a radical shift from today's rigid and inflexible systems towards loosely coupled approaches to ES change and diffusion.

The Agile Perspective and Project Management

Since the emergence of programming methods such as 'XP', 'Scrum' and 'Feature Driven Development' in the late 1990's (Boehm, 2006), there is a growing popularity of agile methods within ES change project management. Instead of extensive upfront project planning as in traditional 'stage-gate' project management, project plans are made mainly for flexibility and

changes, and the purpose of project evaluation is not to compare the progress with the original plan, but to decide new roads of action for the project.

Agile methods are characterized by short iterative cycles of development guided by product features, and continuous integration of code changes during development. The deliverables from each development cycle is working code that can be used by the customer. This is one reason why companies adopting agile methods perceive fewer problems with customer relationships, since incrementally delivering functionality in a sequence of releases appears to better satisfy customer needs (Ceschi et al., 2005). Nerur et al., (2005) summarize that agile development is characterized by system developers and end-users both playing important roles and together forming teams that collaborate in repeated cycles of thought-action-reflection. Team roles are flexible and the communication is informal.

Modern Technology as an Enabler of Agile Methods

Modern technology (e.g., SOA and Internet-based applications) enables ES change projects to aim for partially, step-wise improvements instead of building one single ES from scratch, using several years from requirements collection to full ES implementation. The classical problem is that changes caused by new requirements from the business context are difficult to incorporate during the execution of an up-front planned, large-scale project. Modern ES technology in combination with narrowly defined ES projects, give the opportunity to focus on results and effects in the receiving organization as the base-line for evaluation of the fulfilment of project objectives, instead of adherence to the original project plan.

Chow and Cao (2008) made an explorative study to find out which factors can positively influence on the success of agile system development projects. They identified 12 success factors, which were classified into five categories: Organizational, People, Process, Technical and Project. One conclusion from this study is that modern ES technology enables flexible agile-oriented development, in terms of allowing the project team to dynamically develop the ES in an iterative way, markedly improving the possibility to achieve high customer value and high usability. Modern ES technology matches what Nerur et al. (2005) claim to be a fundamental assumption for the path of agility: "…, adaptive software which can be developed by small teams using the principles of continuous design improvement and testing based on rapid feedback and change." In the Chow and Cao (2008) study, the Technical dimension (agile software techniques and delivery strategy) was found to be the most critical dimension in impacting the success of agile projects.

More Narrowly Defined Projects

According to Standish Group International (2001) there is a trend towards smaller projects. But why are projects turning smaller in time, cost and scope? One explanation is that it currently takes less time to produce each function in a software development project, due to new methods based on modern technology. Another explanation is that top management actively chooses to divide large complex assignments into smaller manageable phases, called projects.

Willcocks and Sykes (2000) have stressed the importance of defining focused and short ES change projects. To run a highly paced project during a long time period is trying for all those involved. To run a long project with a low pace makes it long-winded, tiredness emerges and setbacks appear. Large projects run in global, product-driven markets are often managed through a 'stage-gate' model, enabling high-level management to control the overall project progress, while agile methods are derived from small-scale, contract-driven development projects (Karlström and Runeson, 2005).

Increasing Management Competence

The importance of top management support and commitment has been demonstrated in many studies. Duchessi et al. (1989), in their survey study found that more support is given from top management teams in organizations which successfully implement ESs than what is given in organizations which have been less successful. If the top management team is not aware of how to avoid the pitfalls, then things can go really wrong. Along the same vein, Sumner (2005) advice top managers to aim for reducing the risks associated with ES implementation projects. This requires that top management is capable of identifying the risks and can assess their amplitudes.

The top managers' competence in IT-related questions has most likely increased during the last decades. The trend towards smaller software projects, using modern Internet-based technology which enables project results to be assessed continuously in relation to practical usage – instead of one large long-time, complex project – gives the opportunity to the top management to assess and make decisions in the software projects more often. This helps in overlapping the gap that reflects how the top management lack the understanding of how IT essentially contributes to business value (Morgan, 2004).

PURPOSE AND METHOD

The main purpose of this paper is to identify and discuss new preconditions for established critical success conditions in ES change projects. In this paper we focus on the new type of modern ESs based on user-friendly application generators.

The research design applied in this paper is to use an explorative case study of a change from a traditional ES to a modern ES, after a successful ES development process, to analyse and discuss CSCs enabled by changing preconditions in technology, project size, project management methods and top management competence. The authors of this paper belong to two different academic disciplines, which enables application and combination of the respective perspectives on the problem area. One of the authors conducted the case study of the successful ES change, which is very briefly presented below. Mainly personal interviews and attending project meetings were used as methods for collecting empirical data. Personal interviews were made with top managers, one super user (the co-worker being most knowledgeable about the focal case firm's sales order processes), order assistants, one logistics manager, finance assistants, and with ES vendor representatives. The case study was conducted from early 2006 until June 2008.

CASE STUDY

The ES Vendor

ComActivity, an ES vendor firm based in Stockholm, Sweden, with about 40 consultants, offers solutions belonging to this new modern ES generation, based on open standards such as Java, Eclipse, Web 2.0, BPM and Model Based Applications (MBA). ComActivity's graphic modeling, instead of coding when designing lean and flexible business processes, eliminates 90 percent of the code necessary to represent a business process. One illustration of the difference in level of complexity is that the SAP system consists of about 45,000 tables while the ComActivity system consists of about 2,500 tables (Björkman, 2008a). ComActivity's approach is that new solutions should be implemented step-by-step in relatively limited projects which create business value fairly immediately.

The Focal Case Study Firm

In 2007, the focal firm for the case study, Wermland Paper (WP), chose to change ES from Movex (now renamed to Lawson M3) to ComActivity. WP is a sack paper producer, which holds market leading positions within selected niches for unbleached craft paper, both in Europe and globally. WP has a 90% export share to customers in about 70 countries, and a fragmented customer structure with 800 customers. Its annual turnover in 2007 was about 1.1 billion SEK and the number of employees was around 360. This middle-sized case firm has two paper mills, located in the county of Wermland, in western Sweden. It was concluded that in order for WP to survive in evolving new market conditions, a clear strategy supported by a Web-based ES was needed. Since 2008, WP is part of the Nordic Paper group.

The ES Change Project

Main steps in the ES development project

1. Redesign to a common sales order process for the two mills; 2. Choice of ES vendor to conduct a pilot study; 3. Acceptance-building meetings for the planned customer portal with co-workers and agents; 4. The board's decision to purchase a Web-based ES (modules for order, inventory and invoicing) from ComActivity; 5. Development phase with the main ComActivity developer and two super users.

Business and organizational impacts from ES use after one year

In January 2007, the new Web-based order function, or sales portal, was opened for the internal users. In April 2007, this Sales Portal was opened for the agents. In September 2007 five of its largest agents pre-booked 35% of WP's total sales order volume. In March 2008, 40% of WP's total sales order volume was pre-booked by its larger agents. One year after WP's new ES "went live", the development process of this modern ES and the following implementation process both were perceived by the different stakeholders to have been successful.

New functionality: The agents can all-around-the clock visually access all necessary information via the sales portal; Improved sales order process, which consumes less time and resources; Less errors since orders are placed only once; Full traceability of data when customer complaints are made; Correct inventory data.

All sales order information is now on one screen, compared to twelve screens before the ES change; Since the new ES is much simpler to learn and to use, many more co-workers at WP are placing sales orders than before. The order assistant role is removed; However, the market assistants can not be sure of that the agents have pre-booked their orders correctly via the sales portal. They still have to check the orders. They still have to contact production planning for setting delivery dates.

For WP, the profit margins improved significantly over the 2003-2007 period. In 2007, its profit margin exceeded 10 percent. The CEO of WP comments that "a large proportion of our growth is attributable to the integration and dialogue with our customers. 70 percent of WP's turnover consists of sales to customers to which WP is the dominant seller." Thus, the Sales Portal – offered to its agents in spring 2007 – is an important component in WP's current strategy.

DISCUSSION

The discussion is structured along two perspectives. The first perspective is case specific and focuses on some of the inductive conclusions drawn from the WP case study. Each one of the three general CSCs discussed below are argued to a high degree explain the perceived success for the studied case firm. What are the main conditions explaining the successful ES change process of the case firm?

In the second 'contextual' perspective we relate the observed CSCs in the case study to the described new preconditions (modern technology, agile methods, narrowly defined projects, higher management IT competence) in a general discussion. Which recent changes in preconditions within software development can contribute in realizing the CSCs in ES change projects?

General CSC 1 – High Management Support and Commitment

The number one general CSC in ES change projects, is 'Management Support and Commitment'. There are several ways in which the management can support an internal improvement project. In the WP project, the management played an important role by active participation. The three "heaviest" ambassadors in the top management team – the CEO, the marketing director and the IT director – all had experiences from ES change processes which had turned into failures. In other words, the WP top management had competence about the challenges and pitfalls associated with ES change processes. Therefore, relatively heavy argumentation from the IT director was required in order to convince the CEO and the marketing director about the necessity to make the decision to change ES modules.

The positive side of inertia in organizations is that it makes you think and reflect. The top management team wanted to be sure about a successful ES change process when it made its decision. The insights of the three ambassadors in terms of knowledge about the history and about current ESs, their "bad" experiences, and their support and commitment altogether was an important condition explaining the success of this ES change project. Also, the "ambassadors" became part-owners of the case firm when they were recruited, which very likely strengthened their management commitment.

- New preconditions – high management IT competence

The proposal that support and commitment of managers at all levels are important (e.g., Duchessi et al., 1989) for the success of ES change projects seems almost self-evident. Not many major organizational undertakings would attain their goals without committed managers. But because IT nowadays is a natural part of almost all operations in organizations, the managers' competence about IT-related issues have increased over the last decades. The vast experience from IT project failures, have also made managers more aware of typical pitfalls in ES change projects.

General CSC 2 – High User Involvement

The main ComActivity developer applied a people-centric approach for the development work: short, iterative, test-driven processes that encouraged feedback from the super users and also from the end-users. A small team with highly competent team members was picked: one ES developer/project manager in the forefront (with two developers back-front), two super users (representing system users) and one ambassador (with two more top managers back-front).

In the WP project, the end-users were involved as active participants in the development work. The high competence of the super users was of great importance for the success of the ES change project. Also, the active participation of the market assistants (i.e., end-users of the order system) in the project, which earlier had been critical towards the ES, was another important success condition (cf. Gulliksen et al., 2003). In addition, it is required that the sum of the individuals function as a good project team. There was a good symbiosis in place between highly competent system developers and super users in this ES change project. Such everyday professional cooperation between the participating individuals is obtained if the project members work well together and "swim in the same direction".

Feeny and Willcocks (1998) have stressed the importance of relationship building to establish understanding, trust, and cooperation among the end-users and the IT personnel. The full potential from an ES can not be obtained without a strong coordination of effort and goals across business and IT personnel. As Daghfous (2007) argues, learning alliances is a fast and effective mechanism of capability development. This was an important precondition for the user-driven processes to become successful and to result in positive outcomes.

- New preconditions – modern technology, agile methods and narrowly defined projects

What makes it possible to involve end-users as active participants in ES change projects? An important precondition is the modern technology where user interfaces and functionality can be developed and tested in short cycles of "analysis-development-delivery". This enables the project team to conduct its development and implementation work according to

agile method characteristics (cf. Nerur et al., 2005). It is obvious how well the modern ES development technology supports and works together with agile methods.

Furthermore, in a psychological sense, a small manageable assignment should make project members feel more involved and responsible for the project outcome, compared to a large-scale project, where each team member only contributes with a fragment of the whole picture. The flexibility and simplicity associated with modern ES technology enables for the end-users to have the system designed as they want it to be, avoiding the classical misalignment between the business processes and the ES package (see e.g., Sia & Soh, 2007).

General CSC 3 – Deep Project Management Competence

The IT director of WP was full of faith when it came to choosing the single most important success condition for successful ES changes: "It is enormously important to have the right ES consultant or consultants". To engage a project manager, unable to speak with the end-users, can be disastrous. Communication failures are argued to be one major cause for ES change project failures according to Sumner (2005). Already back in 1983, Block (1983) identified inability to communicate with the system users as one of the cause categories for ES change project failures. The fact that the ComActivity project manager/main developer spoke a language that the super users and end-users at WP could follow was a central success condition. User contact failure risks, such as ineffective user communication and lack of user commitment (Keil et al., 1998), were offset by the communication skills competence of the ComActivity project manager. This, in turn, requires deep business process knowledge and high technical competence of the project manager. Technology failure risks such as, e.g., failure of the information system to meet specifications was offset in the case firm by the flexibility of the new modern ES and the highly competent ComActivity project manager/main developer.

- New preconditions – balancing agile and traditional 'stage-gate' methods

The trend towards agile methodologies and more narrowly defined projects changes the competence requirements on project management. In traditional up-front planned projects, the most important competence seems to be planning skills, follow-up and assessment skills (according to the original plan), and formal reporting to stakeholders. Applying agile methods requires flexibility, informal communication skills and ability to assess and decide how much planning is needed (Baskerville, 2006). The tension between the agility advocated by light methodologies and the perspective advocated by established process improvement frameworks, for instance CMM (Pries-Heje et al., 2004), has created two, at a first glance, contradictive perspectives on ES change.

Recent research indicates that a 'synthesis' between these two contradictive perspectives is emerging. Studies have shown that agile methods can give the traditional 'stage-gate' models powerful tools for micro-planning, day-to-day work control and progress reporting. 'Stage-gate' models give, in turn, a means to coordinate with other development teams and communicate with functions such as marketing and senior management (Karlström and Runeson, 2005). A synthesis of the two perspectives could provide developers with a wide spectrum of tools and options (Boehm, 2002).

Due to the balance needed between traditional 'stage-gate' and agile project management, formal focus on project structure is still required in most projects (Boehm, 2002). The required ability to handle both aspects in parallel – the day-to-day activities in close collaboration with team members, and the structured control of the 'whole project picture' – bring a new dimension to project management competence in ES change projects.

CONCLUSIONS AND FURTHER RESEARCH

'High Management Support and Commitment', 'High User Involvement' and 'Deep Project Management Competence' are considered as three of the most important CSCs for ES change projects. But how are these conditions enabled in practice? This paper proposes that several recent changes in the preconditions for ES change projects contribute greatly to realizing these CSCs.

The increasing experience and competence of managers at all levels regarding IT-related issues, is one important precondition that enables active management commitment and support. Traditional ES technology and traditional project management methods are supporting and matching each other, and are both necessary to handle large-scale projects, but they are not in an effective way supporting the CSCs for ES change.

Supported by the findings from the Wermland Paper case study and recent ES change research literature, we propose that new preconditions, such as modern ES technology, narrowly defined projects and agile methods are matching each other. In other words, modern technology and narrowly defined projects provides the required flexibility which makes it possible to put into practice the agile way of running projects, both for the system supplier and for the customer. We also propose that this combination of new preconditions is more appropriate for supporting the realization of CSCs for ES change projects.

Not all projects are suitable for minimized scope and agile methods, however. There are several advantages in plan-driven, 'stage-gate' project management as well, and voices are now raised for a balance between the two, seemingly contradictive, perspectives. An interesting challenge in future research is to further investigate how different ES change project types, with varying preconditions, require different methods, tools and management support.

REFERENCES

Aoyama, M. (1998) Web-Based Agile Software Development, *IEEE Software*, 15, 6, 56-65.

Baskerville, R. L. (2006) Artful Planning, *European Journal of Information Systems*, 15, 2, 113-115.

Björkman, P. (2008a) CEO ComActivity. Personal conversation on January 14, Stockholm, and telephone conversation on May 18.

Björkman, P. (2008b) SOA – idag och imorgon. Presentation at Computer Sweden's SOA.

Block, R. (1983) The Politics of Projects, Yourdon Press, Prentice-Hall, Englewood Cliffs.

Boehm, B. (2002) Get Ready for Agile Methods, with Care, *Computer*, 35, 1, 64-69.

Boehm, B. (2006) A View of 20th and 21st Century Software Engineering, in *Proceedings of the 28th International Conference on Software Engineering*, Shanghai, China, New York, USA, ACM Publications, 12-29.

Ceschi, M., Sillitti, A., Succi, G. and Panfilis, S. (2005) Project Management in Plan-Based and Agile Companies, *IEEE Software*, 22, 3, 21-27.

Chow, T. and Cao, D.-B. (2008) A Survey Study of Critical Success Factors in Agile Software Projects, *The Journal of Systems and Software*, 81, 961-971.

ComActivity (2008) ComActivity Enables Your Service Oriented Architecture. Retrieved March 13, 2008 from:http://www.comactivity.net/downloads/files/ComActivity%20Enables %20Your%20SOA.pdf

Daghfous, A. (2007) Absorptive Capacity and Innovative Enterprise Systems: A Two-Level Framework, *International Journal of Innovation and Learning*, 4, 1, 60-73.

Duchessi, P., Schaninger, C. M. and Hobbs, D. R. (1989) Implementing a Manufacturing Planning and Control Information System, *California Management Review*, 31, 3, 75-90.

Feeny, D. and Willcocks, L. (1998) Core IS Capabilities for Exploiting IT, *Sloan Management Review*, 39, 3, 1-26.

Gulliksen, J., Göransson, B., Boivie, I., Blomkvist, S., Persson, J. and Cajander, Å. (2003) Key Principles for User-Centred Systems Design, *Behaviour & Information Technology*, 22, 6, 397-409.

Humphrey, W. (1989) Managing the Software Process, Addison-Wesley, Reading, Massachusetts.

Karlström, D. and Runeson, P. (2005) Combining Agile Methods with Stage-Gate Project Management, *IEEE Software*, 22, 3, 43-49.

Keil, M., Cule, P. E., Lyytinen, K. A. and Schmidt, R. C. (1998) A Framework for Identifying Software Project Risks, *Communications of the ACM*, 41, 11, 76-83.

Lyytinen, K. and Rose, G.M. (2006) Information System Development Agility as Organizational Learning, *European Journal of Information Systems*, 15, 2, 183-199.

Mohr, L. B. (1982) Explaining Organizational Behavior. The Limits and Possibilities of Theory and Research, Jossey-Bass Publishers, San Francisco, CA.

Morgan, A. E. (2004) Business Agility and Internal Marketing, *European Business Review*, 16, 5, 464-472.

Nerur, S., Mahapatra, R. and Mangalaraj, G. (2005) Challenges of Migrating to Agile Methodologies, *Communications of the ACM*, 48, 5, 73-78.

Nilsson, A. (2008) Projektledning i praktiken, Doctoral dissertation, Umeå School of Business (in Swedish).

Pries-Heje, J., Baskerville, R., Levine, L. and Ramesh, B. (2004) The High Speed Balancing Game, *Scandinavian Journal of Information Systems*, 16, 11-54.

Rockart, J. F. (1979) Chief Executives Define Their Own Data Needs, *Harvard Business Review*, 57, 2, 81-93.

Shanks, G. and Seddon, P. (2000) Editorial, *Journal of Information Technology*, 15, 4, 243-244.

Sia, S. K. and Soh, C. (2007) An Assessment of Package−Organisation Misalignment: Institutional and Ontological Structures, *European Journal of Information Systems*, 16, 5, 568-583.

Soh, C. and Markus, M. L. (1995) How IT Creates Business Value: A Process Theory Synthesis, in DeGross, J. I. , Ariav, G., Beath, C., Høyer, R. and Kemerer, C. (Eds.) *Proceedings of the Sixteenth International Conference on Information Systems*, New York, USA, ACM Publications, 29-41.

Sumner, M. (2005) Enterprise Resource Planning, Pearson Education, Upper Saddle River, NJ.

The Standish Group International (2001) Extreme CHAOS. Retrieved March 30, 2009 from: http://www.smallfootprint.com/Portals/0/StandishGroupExtremeChaos2001.pdf

Willcocks, L. P. and Sykes, R. (2000) The Role of the CIO and IT Function in ERP, *Communications of the ACM*, 43, 4, 32-38.