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Merja Mattila

Helsinki School of Economics, merja.mattila@student.hse.fi

Joe Nandhakumar

Warwick Business School, joe.nandhakumar@wbs.ac.uk

Petri Hallikainen

Helsinki School of Economics, petri.hallikainen@hse.fi

Matti Rossi

Helsinki School of Economics, matti.rossi@aalto.fi

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Emerging Role of Enterprise System in Radical Organizational Change

Merja Mattila

Helsinki School of Economics, Finland

Joe Nandhakumar

Warwick Business School, United Kingdom

Petri Hallikainen

Helsinki School of Economics, Finland

Matti Rossi

Helsinki School of Economics, Finland

Abstract

In this paper we analyze the role of Enterprise Systems (ES) in shaping a company's transformation process by conducting an in-depth case study in a large European high-tech company. Although there are previous studies concerning organizational transformation and ES implementation process, the role of ES as an instrument for de-institutionalization is not well understood. By drawing on the framework of neo-institutional theory we seek to understand how ES facilitates discarding of the old ways of doing things and the simultaneous forming of the new institutional arrangements. This paper seeks to provide valuable insights into the de-institutionalization process and the role of ES in a company's re-organization. The findings show how ES in use serves as an agent and a platform for de-institutionalization and later as a powerful force in forming the new institutional arrangement.

Keywords: Enterprise Systems, Organizational transformation

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Emerging Role of Enterprise System in Radical Organizational Change

Abstract

In this paper we analyze the role of Enterprise Systems (ES) in shaping a company's transformation process by conducting an in-depth case study in a large European high-tech company. Although there are previous studies concerning organizational transformation and ES implementation process, the role of ES as an instrument for de-institutionalization is not well understood. By drawing on the framework of neo-institutional theory we seek to understand how ES facilitates discarding of the old ways of doing things and the simultaneous forming of the new institutional arrangements. This paper seeks to provide valuable insights into the de-institutionalization process and the role of ES in a company's re-organization. The findings show how ES in use serves as an agent and a platform for de-institutionalization and later as a powerful force in forming the new institutional arrangement.

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1. Introduction

Faced with environmental uncertainty and the need to improve organizational efficiency, and ultimately performance, large international companies have been seeking to implement standardized processes and practices across borders and divisions. Localized business practices have been increasingly forced out by general rules and uniform practices, often implemented through integrated enterprise-wide information systems (e.g. Enterprise System (ES), and its primary form Enterprise Resource Planning (ERP) system). A uniformly implemented enterprise system facilitates standardization of

processes and satisfies needs for management control by concentrating all information into one system and making it available in real-time (Davenport, 1998). However, a more integrated organization structure combined with ES and common procedures does not necessarily guarantee intended outcomes and the ES might actually adopt roles which have never been anticipated before.

In this study we seek to understand the roles that the ES play during an organizational change, where old institutional practices are being replaced by new ones. Extant research has sought to understand either this de-institutionalization process itself, or the process of implementing an ES into an environment, but there is limited research on the role that the ES plays during and after the change.

To study the change process we outline a model for understanding organizational change (Greenwood and Hinings, 1996). We analyze a case company's transformation to gain insights into how a radical organizational change is implemented partially through deployment of an ES. The new organization and ES in the case company are aimed at enhancing the efficiency and control of their global project delivery. We analyze the roles that ES is adopting during organizational transformation by studying employees' own subjective experiences and perceptions on transformation processes and ES. This study was conducted during the post-implementation stage (Markus and Tanis, 2000).

The relationship between information technology and organizational change has been widely recognized (Gurbaxani and Whang, 1991, Leavitt and Whisler, 1958, Robey and Boudreau, 1999). This study draws on neo-institutional theory (Powell and DiMaggio, 1991) and a model for understanding organizational change (Greenwood and Hinings, 1996), and investigates a company in high-tech sector. The high-tech sector may also be considered to be less mature and homogeneous, and loosely coupled and permeable. Further, we study how the case company responds to market and institutional pressures and focus on the role of ES in the change process by adopting a context-aware

perspective with the recognition that ES is a social and physical artifact that is continuously transforming.

The research follows how the case company creates a new institutional order by transforming from a “silo” type organization into a horizontally integrated company with fewer organizational units and stronger company-wide competence centers. We gathered in-depth case data from different managers, specialists and ES users within this publicly quoted company and refined issues of radical organizational change and enterprise systems in certain organizational context. The findings show that the case company is implementing a radical organizational change, in which the use of enterprise system acts as an instrument or even as an agent for transformation by providing tools for restructuring, controlling and decision-making as well as performance measuring.

The remainder of the paper is structured as follows. Background and theoretical framework is presented in section 2. Section 3 introduces the research approach and process. In section 4, we outline the case description. Section 5 contains the case analysis. And finally, sections 6, 7 and 8 include the discussion, conclusion and implications as well as future directions.

2. Background and theoretical framework

Enterprise systems have been defined in many ways in prior research (e.g. Davenport, 1998, Dery et al, 2006, Shanks et al., 2003, Shields, 2001). In this paper we consider enterprise systems (ES) to include the enterprise resource planning (ERP) system functions and all the other applications providing an integrated information system for most functions of a company. According to Davenport (Davenport, 1998) an ES seamlessly integrates all the information flowing through the company (e.g. financial, accounting, HR, SCM and customer information) into a centralized database. Thus enterprise system provides a technology platform that enables a company to integrate and coordinate

business processes and to share information across the company. Enterprise systems also allow allocating and coordination of resources across time zones and geographical locations, while keeping the data available and centralized. In Zuboff's words, "activities, events, and objects are translated into and made visible by information" (Zuboff, 1988). Thus ES aims to organize information processing in an organization around standardized processes or best practices and offers uniform tools to access the data (Davenport 1998, Benders et al., 2006).

Although enterprise systems are seen to increase organizational efficiency (Newell et al., 2003), this depends on the context and whether the associated changes in business processes or efficient control can be achieved (Dechow and Mouritsen, 2005, Grabski and Leech, 2007). The benefits of ES are linked with, for example, the experience cycle (Markus and Tanis, 2000, Shanks et al., 2003), where the majority of possible benefits are supposed to be captured on the later phases of the ES utilization (Davenport and Brooks, 2004, Poston and Grabski, 2001). Organizational change either before or during the implementation is seen as beneficial for the implementation. In this paper we see ES in use as a change agent and a way of enforcing the changed practices.

During a company's organizational transformation enterprise systems may adopt different roles. In studying these roles we adopt concepts from neo-institutional theory by defining enterprise systems as institutions, which are "multifaceted, durable, social structures, made up of symbolic elements, social activities, and material resources" (Scott, 2001). Enterprise system in use may be seen as encoded in the scripts (patterned behavior) used in a specific setting through a socialization process (Barley and Tolbert, 1997). The usage of ES may transform a script and (re-)institute the script through reproducing continuously. After a while the usage of ES becomes taken-for-granted and finally users may not even realize that their behavior is in fact partially shaped by ES. In conclusion, ES influences the actions of its user, but at the same time ES is an outcome of these actions. We consider that this institutionalization of ES is a non-linear process influenced by various forces (Currie, 2009).

In this research, we draw on Greenwood and Hinings (Greenwood and Hinings, 1996) model for understanding organizational change and develop this further. According to Greenwood and Hinings the organizational transformation is defined by applying concepts of radical and convergent change as well as revolutionary and evolutionary change. Radical organizational change involves moving away from an existing orientation and the transformation of the organization. On the contrary, convergent change is fine-tuning the existing orientation. Revolutionary and evolutionary changes are defined by the scale and pace of upheaval and adjustment. Whereas evolutionary change occurs slowly and gradually, revolutionary change happens swiftly and affects virtually all parts of the organization simultaneously. Greenwood and Hinings' model combines market and institutional context with intra-organizational components such as interest dissatisfaction, value commitments, power dependencies (roles) and capacity for action (Figure 1).

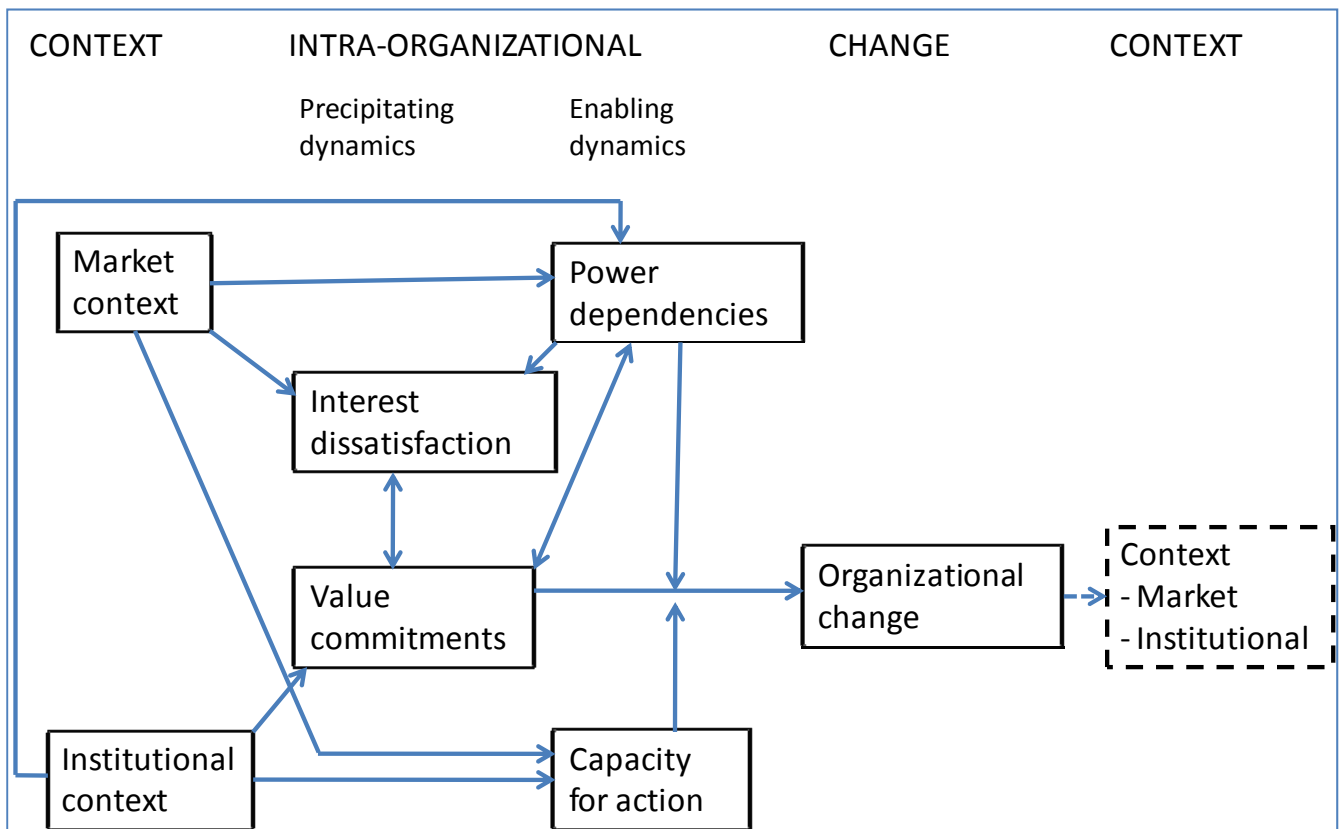


Figure 1. Model for understanding organizational change (Greenwood and Hinings, 1996)

In analyzing the use of enterprise system as an instrument or even as an agent of organizational change, we combine perspectives from the social construction of technology (Kline and Pinch, 2002) and from a human agency perspective (Boudreau and Robey, 2005). We consider that different interest groups in the company associate different meanings with enterprise systems, which leads to interpretive flexibility appearing over the ES. In spite of the mandatory use of ES, users may also be relatively free to enact ES in different ways. In addition, certain features of ES may set opportunities or boundaries for organizational change. Due to these issues, the use of enterprise system may enable organizational transformation and build capacity for action but it can also set certain limits or even prevent re-organization.

3. Research approach

In the research an in-depth case study approach (Walsham, 1993) was employed to generate theoretical constructs (Eisenhardt and Graebner, 2007). The approach was chosen mainly to develop a better understanding of the role of ES in shaping the new institutional order. This was facilitated by researcher access to a company implementing radical organizational change.

3.1. Data collection

The in-depth case study was carried out in a large high-tech company within Europe. The data gathering took 10 months from December, 2008 to September, 2009. During the data gathering, we conducted 12 focused interviews on participants' own subjective experiences and perceptions about enterprise system and organizational transformation process. The face-to-face interviews lasted for 40-80 minutes and they were recorded to MP3 and later transcribed for subsequent analysis. Our first interviewee, who was responsible for the ES development, provided a comprehensive view of how the enterprise system was used in the company and how the company's processes and tools (i.e. enterprise system) were aligned together. Next, we conducted an interview with a vice president who

had been involved in assessing the primary objectives of ES in 2003 and who had also been involved in formulating the latest corporate strategy. Subsequently we widened our knowledge by interviewing managers, ES designers and ES users with different backgrounds at various levels of organizational hierarchy. The selection of the interviewees was based on their positions in the company or the recommendations of other interviewees (Table 1).

Table 1: Interview topics and interviewee's position		
Date	Interview topic	Interviewee's position
9-Dec-08	ES use	Director
8-Jan-09	Primary objectives of ES	Vice President
15-Jan-09	ES use (reporting)	Template Owner
30-Jan-09	ES use	Manager
5-Mar-09	ES use	Senior Consultant
17-Mar-09	ES use (staffing mgmt)	Staffing Manager
18-Mar-09	ES use (project mgmt)	Director
19-Mar-09	ES use (project mgmt)	Director
4-Jun-09	ES use	Template Owner
8-Jun-09	ES (implementation)	Executive Advisor
9-Jun-09	ES use (project mgmt)	Team Leader
18-Sep-09	ES use	Director

In order to ensure data integrity and to capture different points of view, we interviewed participants from different businesses such as customer-specific industries and service lines or support functions. These businesses and functions were at different stages of ES post-implementation. The interviews were conducted by two researchers at a time. Furthermore, an extensive review of company documents, such as annual or financial reviews, Intranet and training (e.g. e-Learning) materials was carried out. During the field study phase we had access to project documentation and other materials regarding the project.

3.2. Data analysis

As the research progressed, we sought to verify the emerging constructs by employing qualitative analysis. The analysis and interpretation of the data continued throughout the research in order to

assure that the results and findings were grounded in the empirical data. Tape recordings and interview transcripts were imported into NVivo, a computer-aided qualitative data analysis software. NVivo was used for organizing and sharing data, but analysis was mainly performed by using a tool for drafting concepts. During the data analysis we sought to focus on the process of generating theory and building theory rather than testing theory. The research themes that emerged from the data were categorized. During the initial coding phase we defined codes such as Training, Reporting or Common metrics. These codes were joined together into categories such as Capacity for action, Restructuring, Controlling, or Performance measurement. As these patterns emerged, we started to view them in more abstract terms (Miles and Huberman, 1994) in order to develop our conceptualization. In this process we used Greenwood and Hinings', (Greenwood and Hinings, 1996) model as a sensitizing device (Walsham, 1993). During the thorough analysis two core categories emerged from the data. These two core categories were "ES as an instrument" and "ES as an agent". The shaping of the first category "ES as an instrument" was quite obvious as interviewees expressed that the company's transformation would not have been possible without a company-wide ES. Also the other core category, "ES as an agent", was based on these observations as we realized that while ES increased the capacity for action, it also adopted unanticipated roles by decreasing the capacity for action gradually becoming an agent for change.

4. Case description

Neon (a pseudonym) is a large multinational high-tech company; being among the leading high-tech companies in its main markets in Northern Europe. Compared with a more traditional context, high-tech sector is seen as less mature, less homogeneous and loosely coupled institutional sector with permeable boundaries. There were interactions between this sector and other institutional sectors: typically through high rotation of personnel and close customer relationships. This interaction also

enhances the creation of new solutions and circulates them to high-tech companies within high-tech sector.

During the last decade the company has experienced a rapid growth through acquisitions, mergers and strategic alliances and has become more international in step with its customers. For the last few years the market environment has been challenging for Neon as well as its customers. Neon's revenues have declined and the company's shareholders received a public tender offer during spring 2008. Major changes in the financial markets and prudent IT investment by customers were seen as major challenges for Neon in the future.

At the beginning of 2009, Neon announced a new steering model and a matrix organizational structure. This was aimed at transforming Neon into a more horizontally integrated company. Previously the company structure had been based on business areas (customer-specific industries) and it had operated in small, industry- or customer-specific teams, which had taken care of every phase of customer projects. The interaction between business areas had been inefficient as one interviewee described:

"We definitely had quite strong process owners in Finance and in Sales. However, business areas were so independent that there was not such process owner, whose position would have been so strong and legitimized that he or she would have been capable to telling how we have to do things." (Director)

The team heads had been responsible for resource management by exchanging employees between teams according to project and customer needs. During the last few years, Neon had gradually been transferring employees from teams to larger industry- or customer-specific competence groups located in business areas (Figure 2: A. Business Area Structure).

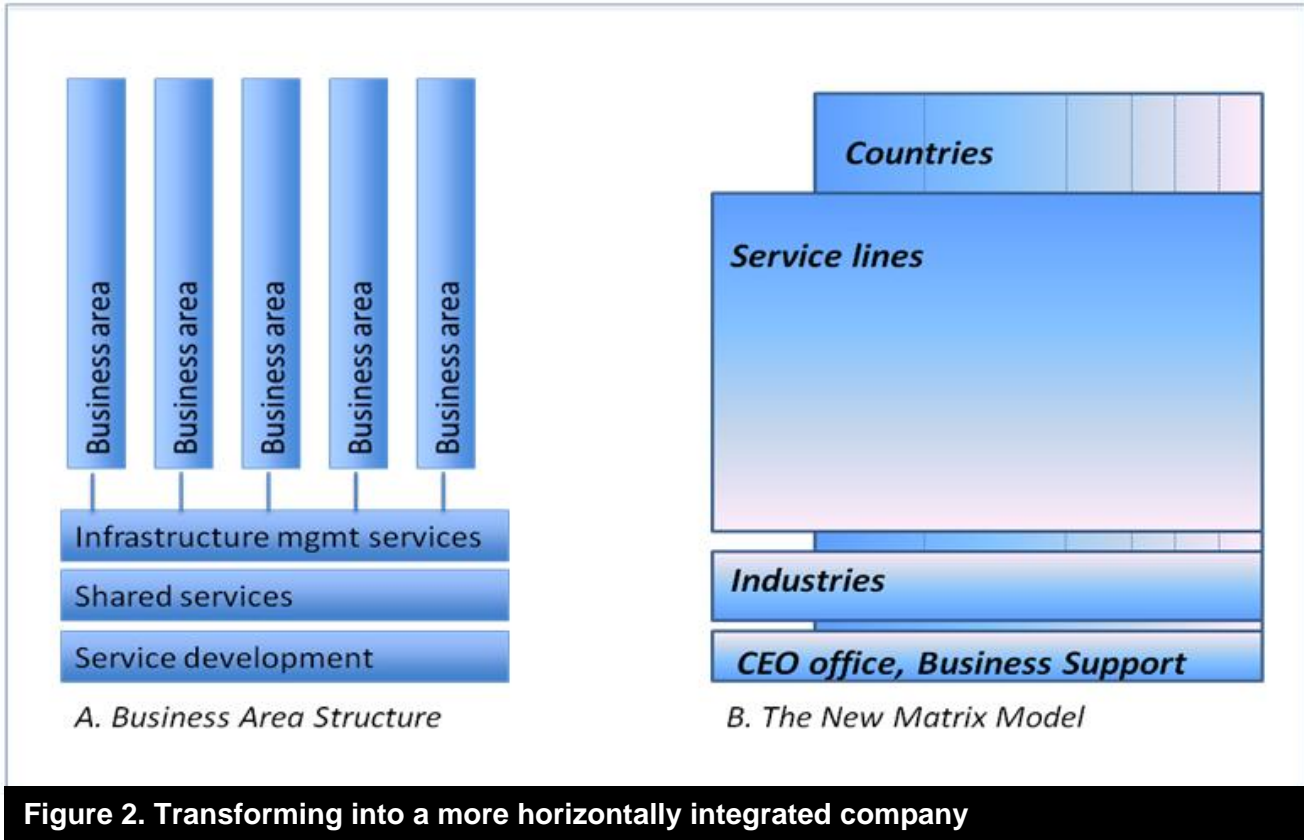


Figure 2. Transforming into a more horizontally integrated company

In the new matrix model most of the employees were located in service lines and industries diminished in size and in power. The new organization structure had a stronger focus on countries, fewer organizational units and stronger company-wide competence centers (Figure 2: B. The New Matrix Model). In order to increase global service capabilities and to respond to intense competition in high-tech sector, the company implemented a global delivery model. According to the company's Annual Report, (2008) 40% of its employees would work in the global delivery centers in the future.

Neon has many newly appointed executives, such as the CEO, Head of Service lines, Head of Country and Head of HR, and some of them came from non-high-tech sectors. There was also a shift in values resulting from the new executives attempting to emphasize more on human resource management and corporate culture change, and also refocusing the organization to be more customer oriented. They regarded a company's work force as vital to its economic competitiveness. Neon also

recruited executives with deep experience in the outsourcing services and familiarity with the market situation in strategically important locations. It was hoped that this would enable the organization to act in a fundamentally different way. The new management considered ES an important tool for this transformation.

Neon's enterprise system was based on a commercial product and it was integrated with local banks, local payroll systems, common invoice center system and common reporting and budgeting system, and it had the basic operational functionalities for an expert organization. The ES project started in 2003. Currently, over 90% of Neon's staff uses ES daily in nine countries.

In the background of the ES project was a need for corporation level process harmonization and reporting. Because Neon had a fragmented IT system history with different systems and versions in daily use, ES was aimed to provide a common service for the whole organization. Furthermore, the ES implementation sought to improve control over the company's international businesses. As a result, ES provided efficiency improvements in financial processes:

“A need for cost-efficiency led to the situation that we got sort of as a by-product a possibility to relocate accounting activities. First we centralized accounting activities and second we re-located them in a lower-cost country.” (VP Finance)

The primary objectives of ES were defined in such a way that they favoured the interests of support functions (such as accounting, HR) instead of interests of businesses. The ES was seen as a tool for unifying new processes and making the consolidation of data across units and countries easier. To facilitate this no local or industry specific customization was allowed. Project management designed the features and procedures of ES with limited end-user consultation. Many of the interviewees reported that ES, which offered standard functionalities only, replaced their sophisticated best-of-the-breed local systems. Therefore, ES acted as an extension of accounting control and was seen as an

invoicing tool governed by accounting function (ownership, access management). Because the ES supported centralized decision-making authority and control many felt that the business areas could not realize its benefits. The ES was resisted by users and its reputation as an enterprise-wide information system suffered. Also the quality of information was poor.

5. Case analysis

The analysis mainly focuses on the intra-organizational dynamics and the roles of ES during transformation. Next we illustrate Neon's change and the roles of ES during transformation.

5.1. Interest dissatisfaction

As noted in the case description Neon had been structured according to business areas, which served customers in different institutional sectors. These institutional sectors differed from each other due to, for example, maturity or strategic importance. Business areas were only loosely integrated and they had clear boundaries. Definition of process owners was aimed to increase interaction between business areas, but they were usually not strong enough and organizational situation did not legitimate their position. Without transparency and common metrics between units, Neon's resources were not utilized efficiently. Decision-making authority was delegated to business areas and corporate management required only some common procedures and ES reporting. In short, business areas had their own sub-cultures and operating practices, and ES was mainly considered an invoicing tool providing information for support functions.

The internal complexity of the organization was rather high and there were different interest groups structured by, for example, management level, industries, geographic locations, and roles or competencies of employees. The staffing management group was a new agent in the organization.

Previously resource management had been handled between certain units, but in the new organization structure staffing managers and staffing management group were acting as an internal, global platform combining external customer needs and internal competencies. The use of ES might have served this process by providing a crucial module for project resource management (RM-module). However, it was evident that the module had not been implemented and thus the resource management process did not work as designed. It was also unclear how global project resource management process would work in practice and how ES would serve this process as one staffing manager described:

“We are waiting for a tool for staffing management. But how the process (global delivery management process) really works and how it can be made to function depends on project managers and process owners, who are supposed to do another side of this process, requirements.” (Staffing Manager)

According to the interviews the use of ES served the transformation by providing reporting structure and tools for both vertical and horizontal reporting needs. Neon also implemented some new corporate level metrics concerning internal processes and increased the reporting frequency. Faster and more transparent decision-making created a potential pressure for change or inertia, because interests of different groups conflicted at all events. This caused resistance to ES use or unwillingness to provide more accurate information. For example employees perceived forecasting of personal workloads frustrating in a turbulent market situation.

5.2. Value commitments

In order to create a collective meaning to strategy and the way of organizing, 1000 employees joined the strategy formulation process in 2008. We found that there were several competitive commitments in the organization, where some groups supported the template-in-use, whereas others preferred the emerging matrix model. These value commitments varied between and within different interest groups.

Because of the challenging market situation (a decline in revenues, a public tender offer) Neon had searched opportunities to become more horizontally integrated. The aim of the new steering model and matrix model was to make it easier for Neon to utilize competencies and to release full potential to become more agile and to serve customers more efficiently. This assisted Neon to balance demand between different functions in the organization and to increase employee's utilization rates. Due to this Neon was eager to respond to the market requirements by implementing the new matrix model.

Neon had previously rearranged its operations several times and it had grown through acquisitions and mergers. The complexity of the organizational arrangements had produced a large product and service offering. Also the portfolio of activities had been changed and some activities had been re-located during the last few years. In addition, the composition of the workforce had diversified and different parts of the organization had been specialized into silos of expertise. It was evident that in order to respond to this fragmentation and to utilize all of its competencies Neon needed a new structure. The emerging matrix model was seen as this new structure.

Although Neon is a global leader in selected segments, it is not centrally located within its institutional sector due to its peripheral local main markets. The peripheral location within its institutional sector made Neon less committed to existing practices and readier to develop new ones.

5.3. Power dependencies

As discussed earlier, Neon had different interest or power groups, which varied in their ability to impact transformation. Many employees had not worked in a matrix organization before and they were not sure about their roles and responsibilities. Organization had also new managerial roles (e.g. staffing managers), whose impact on others' decision-making authority was unclear. Staffing managers' role was to allocate resources across projects and former business sectors. Because

groups had different level of power, they varied in their ability to influence re-organization. For example some well-performed directors or well-known gurus in certain key focus areas were listened to more keenly than others and thus they had more potential for enabling or resisting change. In addition, some major changes, such as downtrend or postponed projects in certain customer base, in a market context may have impacted the relative power of groups within the organization.

The allocation of decision-making authority among interest groups or individuals in a company is determined by the costs associated with acquiring, storing, processing and disseminating information. It also depends on other organizational and environmental factors such as the role of ES in the company, characteristics of the information flows, and the organizational culture. On one hand, ES may have supported decision-making authority and control among the interest groups and individuals in Neon by centralizing some decision-making authority rights and by decentralizing others. Further, ES may have moved the location of centralized decision-making authority and control. On the other hand, users had the power to define the importance of ES by using or ignoring it. In short, ES influenced the allocation of decision-making authority among interest groups or individuals, but at the same time ES was an outcome of this allocation.

5.4. Capacity for action

Neon's new steering model and matrix organization seemed to emphasize HR processes and a unified corporate culture. The company tried to change organizational culture so that employees would feel that employer makes an investment in their expertise and competencies. Rewards were increasingly based on individual performance. This emphasis on individualism meant a cultural shift, which altered the work environment and was intended to support Neon to achieve the new objectives.

The company sought to increase investments in employees to achieve skills and competencies required to function in the new matrix model. Although the transformation process was communicated

continuously through the company's intranet, interviewees found the mobilization of the new matrix model problematic. The role of ES in the transformation process was considered essential, but the tools were not available yet. Also the implementation projects were considered difficult. This lack of clarity helped to promote almost experimental steps and influenced the speed of change. Interviewees had a lot of experience of recent organizational changes and ES was believed to be rather immune to any future reorganization within the company, which increased the capacity for action. ES also helped to influence the development of a corporate-wide organizational culture replacing different sub-cultures. Further, the difficult market context had an impact on the level of capacity for action by increasing the possibility for radical change.

The analysis indicates that Neon underwent a radical change, which disregarded the previous organizational structure. The institutional and market context had led to shifts in the organizational structure and strategy to respond to competition and cost-efficiency requirements. The newly appointed executives were seen as the precipitators of change. Obviously Neon was transforming from an old project organization to a more industrialized model in which project tasks were divided into small parts. Staffing managers took an important role in managing resources and increasing utilization rates. Different ES implementations and industry-based procedures were replaced by one enterprise-wide implementation and process model. This created the new way to perform things in ES.

6. Discussion

Our analysis indicates that the ES played a dual role of both de-institutionalization by providing tools for re-structuring, controlling and decision-making as well as performance measuring and gradually becoming an agent in re-institutionalization process (Figure 3). Based on the description of the forces of de-institutionalization above we discuss the role of ES in implementing the change and reinforcing the new structure.

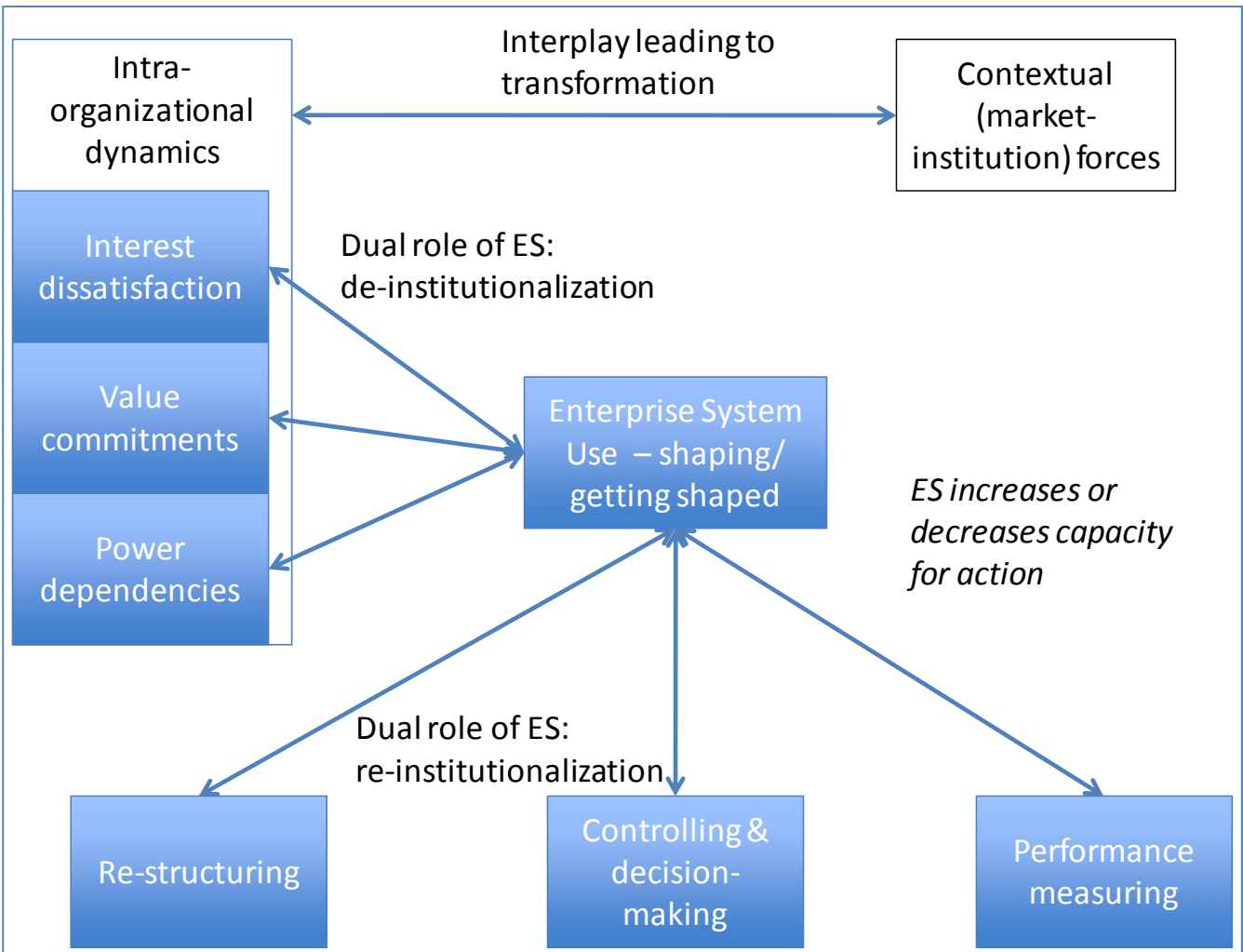


Figure 3. Dual role of enterprise system

6.1. Re-structuring

In the new matrix model the competence pools were larger than earlier and managers had more subordinates located globally. The use of ES decreased fragmentation of the workforce and unified different sub-cultures. In this situation the use of ES served as an instrument for re-structuring by helping to introduce common procedures and stabilizing them through reproduction of these procedures over time. It may also have had potential in finding out synergies between business units. However, working within the matrix structure was new to many employees and they were unsure of their roles and responsibilities. Also increased transparency, measurability and comparability between units and competence centers linked with implicit off shoring objectives caused resistance towards ES.

This combined with the complexity of ES usage caused employee frustration and difficulties in communication process. In addition, the transformation process itself caused inefficiencies, when old tools and procedures were ignored even they were efficient and workable and the tools for transformation such as ES's project resource management (RM) module were not available. In addition, units were going through different phases in the ES life cycle and the perceived benefits differed accordingly.

As described above, ES was an important instrument for the change initiative by providing multidimensional organizational structure and tools for transformation. Interviewees believed that the new matrix structure and the global delivery model would have been impossible to implement in this schedule without enterprise-wide information system.

6.2. Controlling and decision-making

Previously, when benefits were not realized, ES was seen as a black box at Neon. The usage of ES varied with business areas and the “one company and one tool” –principle did not work in practice. The new matrix model was setting more requirements for e.g. information quality, forecasts, or common processes than the previous organizational structure. The usage of ES was seen as mandatory and advanced usage would create more benefits for users and the company. The relationship between the new matrix model and ES was reciprocal: ES served as an instrument for transformation by increasing capacity for action, but at the same time the transformation shaped the usage of ES.

ES also acted as an agent for change by relocating and tightening centralized decision-making authority and operative control. Previously resource management was handled between small teams, but in the new global delivery model service line management was responsible for staffing management. ES's project resource management (RM) module was the main tool for resource

management. We argue that in the new matrix model the control of ES was not decentralized but rather re-located to staffing managers and service line management in order to achieve company's off shoring objectives.

6.3. Performance Measuring

The use of ES acted as an instrument in company's cultural shift towards individualism by providing tools for e.g. individual performance measurement. The new model emphasized individual measures such as utilization rate or competence development instead of employee's customer invoicing or team results. This is somewhat contradictory to the espoused values of seeing team and project performance as the key to company success. Also high emphasis on utilization rate in the managers' short-time incentives may lead to ignoring the off shoring objectives, which are seen critical for the company's long-term competitiveness.

However, the project resource management module was not yet implemented at the time of the research and in that sense the ES decreased the company's capacity for action in the transformation process. For resource management and utilization this module is critical.

7. Conclusion and implications

In this paper we analyzed the role of ES in the organizational transformation process. We used the model of Greenwood and Hinings (Greenwood and Hinings, 1996) as the theoretical basis for our analysis and developed a new conceptualization of the role of ES in the organizational transformation process. It was found that the ES has a dual role in the transformation: it helps both to implement and to sustain the change. Moreover, the ES will affect the power balance in the organization. Finally, since an ES is instrumental for the change, it can also decrease an organization's capacity for action if the implementation of the ES modules is delayed.

7.1. Theoretical implications

Our results show that the ES played a dual role in the transformation process: 1) it helped to implement the change initiatives and 2) it helped to sustain the new organizational structure.

The ES acted in an instrumental role in establishing a platform for the new matrix organization. Moreover, it acted as an agent since implementing the ES relocated decision-making power in the organization. In helping to sustain the new organizational structure the ES acted in an instrumental role in providing tools for the reproduction of the new practices over time.

In addition to playing the dual role of enabling the change and reinforcing the new form, there is a reciprocal influence between the ES and the organizational change. While the ES enabled and helped to sustain the change it was also getting shaped by the organizational change and eventually as the implementation progressed the ES was shaped by the organizational objectives.

Finally, there was also a reciprocal influence between the deployment of the ES and power (cf. Jaspersen et al., 2002). Our analysis indicated that there were profound changes in power relationships in the emerging matrix organization; however Greenwood and Hinings' model offered a limited conceptualization of this dynamics. Organizational actors tried to influence the way the ES was implemented while the ES in-use affected the sources of power through altering the ability to control over allocative resources. This issue is highlighted by the system's ability to balance work load across time zones and old "islands" of specific project competence, by allowing the new roles of staffing managers and competence centers to distribute work in a globally optimized way. At the same time the current incentive structure reinforced local utilization of capacity but the operation of this power relationship relies upon the compliance of local project managers. The individual project managers

might choose not to update capacity availability into the system, thus demonstrating dialectic of control (cf. Giddens, 1986).

7.2. Practical implications

Many of the previously identified problems, such as resistance to change and problems related to role changes and ambiguity were present in our case. However, our results provide a new understanding of the role of the ES in the organizational transformation process.

Furthermore our analysis highlights the importance of planning the deployment order and timing of ES in such a way that it helps the change process instead of hindering it. In this case the delay in implementation of the resource allocation and project monitoring (PM) modules clearly caused resistance for the whole change, as the benefits and burden of the new tasks were distributed unevenly (e.g. project managers had to input far more detailed planning information, but they did not get advanced project reporting before the PM module would be implemented).

The management expectation that the system could act as a control structure by itself seems theoretically problematic and practically much challenged. For the change to succeed knowledge workers need to understand and be well motivated to use the system according to the new processes. If the system does not support the users in their daily routines, it is unlikely they will utilize it, thus rendering the sought management coordination obsolete.

7.3. Future research

In order to understand the dynamics of changes to the organization we seek to elaborate our theoretical framework by drawing on Giddens (1986) concept of power. Giddens sees power as a capability manifested in action rather than just a form of action or resources. Giddens view of power is

'relational' and the working of the power relationship depends on the compliance of those subject to it. Giddens therefore states that "all forms of dependence offer some resources whereby those who are subordinate can influence the activities of their superiors" (Giddens, 1986, p.16). The study will use Giddens concept to extend the theoretical development by exploring the changes in the roles, responsibilities and influences in this context. The data collection at Neon continues and we expect to uncover power relations and changed organizational patterns that are caused by the implementation of the ES and its use.

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