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Institutionalization as a Rhetorical Process and its Effect on Appropriating ERP-technology: A Case Study

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ABSTRACT

This thesis will explore an ongoing change process in a large Norwegian Railroad Corporation (NRC). The corporation has recently implemented an Enterprise Resource Planning (ERP) system in order to integrate human resource processes across all units and divisions in a well-organized and consistent manner. We sought to explore how organizational agents within the different units appropriated the new technology, and how institutionalization at the micro level could influence these appropriation patterns.

To carry out our research agenda, we pursued a social constructivist approach, with structuration theory as a central tenet. Through a series of depth interviews we inquired into the argument structure applied by the organizational agents with the aim of exploring to what extent the practice of implementing ERP-systems was institutionalized. Our inclination was that the degree to which the application of ERP-systems had been taken for granted amongst organizational agents, it would be related to how the agents appropriated the technology. Appropriation highlights the importance of the agents' understanding of the technology's goals, as well as how well their use of the system supports these goals.

Our findings suggested a relationship between the two constructs. An argument structure which indicated a partial institutionalization of the practice was found to be related to an appropriation pattern which bolstered the technology's intent. However, a discursive style which suggested institutionalization to the extent where the practice had been taken for granted, was related to a less faithful appropriation of the system. This is in congruence with the „institutional argument“. In the event where no evidence of institutionalization was established, the least faithful patterns of appropriation were found.

TABLE OF CONTENT

INTRODUCTION	1
PREVIOUS RESEARCH ON THE IMPLEMENTATION OF ERP- SYSTEMS.....	4
Information Technology and Organizing.....	5
Appropriation.....	7
Institutionalization	9
Institutionalization as a rhetorical process	10
EXPLORING LINKAGES BETWEEN INSTITUTIONALIZATION AND APPROPRIATION	13
CHANGING TECHNOLOGY IN NRC: A CASE DESCRIPTION.	15
Defining the technology's spirit through iterations.....	16
Ironic Appropriation	17
METHOD.....	19
Interpreting the Interviews.....	20
FINDINGS	21
Unit A.....	21
Unit B.....	22
Unit C.....	24
Unit D (respondent 1 and respondent 2).....	25
Unit E.....	29
Unit F	31
Unit G.....	32
Table of findings.....	34
DISCUSSION	36
Institutionalization and how it is related to appropriation	37

Organizational Sensemaking in the change processes.....	40
LIMITATIONS & FUTURE RESEARCH.....	42
CONCLUSION.....	43
REFERENCES	44

TABLE OF FIGURES

Figure 1 Example of a Syllogism	11
Figure 2 Argument structure in Unit A	21
Figure 3 Argument structure in Unit B	23
Figure 4 Argument structure in Unit C	24
Figure 5 Argument structure in Unit D (Respondent 1)	26
Figure 6 Argument structure in Unit D (Respondent 2)	27
Figure 7 Argument structure in Unit E	29
Figure 8 Argument structure in Unit F	31
Figure 9 Argument structure in Unit G	33
Figure 10 Table of results	34

INTRODUCTION

In order to meet the heightened rigors of global competition, most organizations have sought to reap the full potential and unique capabilities in new and advanced technology (Zuboff, 1988). The need for control and information within the modern organization is further spurred by complex supply chains, exceeding demands from clients and customers, and continues efforts toward cutting superfluous costs. The great challenges in integrating the scope of cross-functional chains of business processes has been an important drive towards holistic process oriented IT platforms (Al-Mashari, 2001; Lyons, 1997). In this respect, Enterprise Resource Planning-systems (ERP) may be seen as one of the most important developments in the corporate use of information technology (Davenport, 1998; Akkermans & van Helden, 2002).

ERP-systems are large-scale, integrated application software packages with the aim of supporting business processes, information sharing, and reporting purposes within and between organizations (Seddon et al., 2010; Lee et al. 2010; Ke & Wei, 2008). ERP-systems further seek to streamline business processes and eliminate duplication of effort and data (Kwahk & Ahn, 2010). Because the functionality and logic of business processes inherent in ERP-systems are essentially developed on industry „best practices“, the ERP-systems are often implemented as a standardized solution package without much local adaptation, making the organization fit the ERP-system rather than the other way. The potential redesign of pre-existing business processes and communication flows entailed by ERP-systems requires substantial planning and training which makes ERP implementations a rather expensive form of organizational change (Rothenberger et al., 2009). ERP-systems can further alter job roles, redistribute informational power and change social structures – depending on the size and scope of the ER solutions (Al-Mashari, 2001; Kim & Kankanhalli, 2009; Morris & Venkatesh, 2010). In 2009 the overall market for ERP-systems was valued at USD 20.1 billion in total software revenue (Hesterman et al., 2010). Isolated, a number of corporations have spent several million dollars in order to acquire and implement more sophisticated enterprise systems (Seddon et al. 2010). The industry of ERP software vendors is rather homogeneous and consists of a few large companies. With an overall market share of 25.5%, SAP is the leader in the

worldwide ERP market, according to the 2012 report issued by Gartner Inc. (2012). Among large corporations with a revenue exceeding USD 1 billion, SAP is the indisputable vendor of preference (Panorama Consulting Group LLC., 2011).

We can understand the implementation of ERP-systems to both support organizations in their efforts to compete in a changing business environment, but also simultaneously catalyze organizational change. By reviewing past endeavors in implementing ERP-systems, many organizations are likely to experience the implementation to be excruciating in terms of costs and efficiency (Seddon et al., 2010; Davenport, 1998; Peslak et al., 2007). As an example, FoxMeyer indicated their initiatives of implementing SAP R/3 to have led the company to bankruptcy (Davenport, 1998). To this end Kwahk & Ahn (2010) estimated more than two thirds of ERP-system implementation projects to have resulted in failure.

The great impact that ERP-systems can have on the organizational working environment, and the relatively high risk of failure associated with the implementation have pertained to both researchers and practitioners, accumulating a substantial body of research on the topic. Previous research on ERP-systems and its implementation have identified and addressed several factors which are proposed to determine the success of implementing ERP-systems (Ngai et al., 2008; Ke & Wei, 2008; Akkermans & Helden, 2002; Seddon et al., 2010). However, by reviewing the past efforts in predicting and identifying success-factors in ERP implementations, we find much ambiguity concerning the conception of “success” (Infinedo et al., 2010). Success can for instance be assessed by the organization acquiring the ERP-system, and how well the system supports the organization’s operations (Seddon et al., 2010; Thong et al., 1996; Brazel & Dang, 2008), by the IT developers in terms of deliverance being within budget and on time (Davenport, 1998), by the level of satisfaction among the technology users (Morris & Venkatesh, 2010), or a combination of the above parameters (Rothenberger et al., 2009; DeLone & McLean, 2003).

The great ambiguity in defining success is severely hampering researchers in identifying and agreeing upon any universalistic success factors in ERP implementations. Much of the research seeking to identify success factors, we will argue, is not taking into account the complexity and distinctiveness of

implementing an ERP-system. These systems are to be comprehended by human agency in order to be effectual, and will ostensibly be open for more than one interpretation. Within an organizational setting, it would be myopic to ignore the social interaction and communication among the participants, and the how they construct knowledge for one another. Adding to that, we believe the widespread application of ERP-technology could to some extent have manifested itself to the organizational agents' underlying belief pattern regarding the ERP-system's applicability. Hence, the ERP-system could already have attained a set of presuppositions which are taken for granted, i.e. being institutionalized among the organizational agents. Based on this knowledge we will pursue a social constructivist research agenda in order to inquire into the ambiguous field of organizational change as both spurred, and supported by the implementation of ERP-systems. Our inclination is that the degree to which the corporate use of ERP-systems institutionalized will have ripple effects in the consecutive phase of putting the system into use.

In this study we will conduct a series of depth interviews with managers in a large Norwegian Railroad Corporation (NRC). NRC commenced the implementation of a SAP package solution circumscribing the company's human resources (HR) practices in 2011, and is currently seeking to put the system into use. We will apply Toulmin's analytical framework to interpret the rhetoric used by the interviewees in our study, as we believe this could help us understand to what the extent the practice has been institutionalized, and further how the level of institutionalization is related to consecutive appropriation of the ERP-system.

PREVIOUS RESEARCH ON THE IMPLEMENTATION OF ERP-SYSTEMS

The Technology Acceptance Model (TAM) is by far the most applied model to predict the success of organizational efforts in implementing new technology, which ostensibly has guided subsequent research on ERP-systems to follow the same tradition of applying TAM. The model assess behavioral intentions towards interacting with technology based on belief patterns regarding the technology's perceived usefulness and perceived ease of use (Davis, 1989). Perceived usefulness refers to the beliefs concerning the technology's capability to support work related goals, and perceived ease of use refers to a subjective evaluation of necessary effort required to use the technology. This mental calculation of cost and utility will result in an intention to use the technology (Davis, 1989). The model is resting on the theory of reasoned action proposed by Ajzen and Fishbein, in the respect that behavioral intentions are spurred by attitudes directed towards the behavior (Ajzen & Fishbein, 1972). TAM has received empirical support and catalyzed a considerable amount of research, probing for relevant antecedents and mediators to further enhance the model fit (Venkatesh et al., 2003; Marler et al., 2006; Barki, et al., 2008).

However, we identify several critical limitations in applying TAM in the domain of implementing ERP-systems. Firstly, there are important differences between intention to use and actual usage. Turner et al. (2010) found that the majority of studies which applied the technology acceptance model are measuring intentions to use rather than actual usage, and further found some of the variables in the model to be less than significantly related to actual usage. Secondly, we find the concept of acceptance to be severely constricted by the idea that IT can only be used in one way only – congruent with the intended purpose. We will argue that novel information technology will be subject for individual interpretation and sensemaking, and thus attain a wide variety of „meanings“ relating to how the new technology can best be applied (Weick, 1990). The third weakness of applying TAM in the domain of ERP-systems is that we find TAM best suited to predict use of new technology in a context in which usage is volitional. Usage in the domain of ERP-systems stands in sharp contrast to this presupposition, in which

the individual user would not have a mandate to choose whether or not to use the technology. The potential benefits the ERP-system seeks to promote hinges on the employees in the manner in which they engage with the system (Leonardi & Barley, 2010; Huy, 2001). An organization which endorses deep structural alterations in workflow mediated through ERP-systems on a voluntary basis would most likely find itself in ferment and confusion. Hence, intentions to use or not to use new technology, as predicted by TAM, are of less importance in a mandatory setting, and the process of interpreting and the subsequent interaction with the technology becomes prominent. We, in consent with Schwartz and Chin (2007), find it more interesting to assess variation in use-behavior rather than acceptance. We will therefore reject TAM, and treat the impact of technology on the adapting organization as socially constructed. In doing so we seek to capture the holistic conjunction of a user's actual interaction with the ERP-system and the user's psychological interpretation and understanding of the goals the system seeks to affirm (Schwartz & Chin, 2007; Leonardi, 2007). In the next section we will visit a social constructivist perspective on information technology and how organizations are putting it to use.

Information Technology and Organizing

In the realm of information technology, Robbins-Gioia found that 46% of the responding employees in an organization with a newly implemented ERP-system did not believe their organization understood how to use the system in a way that improved business conduct (as cited in: Ifinedo et al., 2010). When the uncertainty regarding the system is as prodigious as in Robbins-Gioia's study it would be unrealistic to expect identical patterns of usage within an organization.

Much research on information technology has carried out a quite object-centered research agenda, in which technology is seen as a determinant for organizational structure and behavior (Fulk & Steinfield, 1990). This view harmonize well with that of early contingency theorists (e.g. Thompson, 1967; Lawrence & Lorsch, 1967; Perrow, 1967), postulating that "technology is an independent variable, and structure [...] as a dependent variable" (Perrow, 1967: 195). This view was later challenged by social constructivists, rejecting the hard forms of technological determinism. Although they acknowledged that technology could greatly affect organizational work processes, they argued "that social dynamics shaped the

adoption, implementation, use and meaning of technology...” (Leonardi & Barley, 2010: 5). Hence, technology will often be developed with features to restrain and encourage different patterns of interaction with the system, but “even the most „black box“ technology has to be apprehended and activated by human agency to be effectual” (Orlikowski, 1992: 408).

In stark contrast to Perrow’s (1967) propositions of technology as a determinant of structure, based on observations in U.S. hospitals, Barley (1986) found two different hospitals to show significant variation in how they applied similar radiography scanning technology. In a related study, Orlikowski (1996) found people to gradually invent new use of technology after implementing it in order to adapt it to the agents’ specific needs. This point is emphasizing both technology as an equivocal (Weick, 1990), and organizational change as „situated“ (Orlikowski, 1996). “What could from the outside be seen as a mere episode of technical change, whereby one tracking system replaces another, became, from the perspective of ongoing change, an increasing momentum, a flow of opportunity-driven choices, and unanticipated changes.” (Tsoukas & Chia, 2002: 578). Pentland and colleagues has also provided support for the notion of information technology as a source for variation in routines, rather than automation and giving further valance to the situated view of organizational change (Pentland et al., 2010; Pentland et al., 2011).

In order to avoid determinism of either technological or social nature, researchers of information technology has resuscitated Giddens’ theory of structuration for understanding the duality in the relationship between structure and agency (Giddens, 1984). Human agents will in Giddens’ structuration theory use social structure to guide actions, and simultaneously, will those actions serve to produce and reproduce social structure (Jones & Karsten, 2008). Structuration theory accounts for social phenomena at a high level of abstraction, which has later spurred great interest amongst information system (IS) researchers (Jones & Karsten, 2008; Salisbury et al., 2002). In the same way Giddens rejects the notion of objective and social structures dictating human agency, adaptive structuration theory in IS research, rejects the idea of technology as an objective force dictating human interaction with the system (Orlikowski, 1992; Fulk, 1993). “Communication structure and uses of organizational media shape each other in

an emergent of mediated and non-mediated social interaction” (Contractor & Eisenberg, 1990 In: Fulk, 1993: 922). Although Giddens’ work was not explicitly intended to explain social phenomena relating to use of technology, the analogy seems adequate. Indeed, Giddens does make a claim that “Technology does nothing, except as implicated in the actions of human beings” (Giddens & Pierson, 1998 In: Jones & Karsten, 2008: 131). Hence, the ERP-system’s design and features can guide interaction, but only insofar the technology user complies.

Although most researchers within the field of technology and organizing agree with the underlying premise of social constructivism, there are several co-existing conceptions of what is implied regarding the effect of technology being a social construction (Fulk et al., 1995; Leonardi & Barley, 2010). The different perspectives diverge in regards to their level of analysis, what social phenomena they inquire into, and different phases in the implementation of technology (Leonardi & Barley, 2010). For the purpose of our study, we found the appropriation perspective to be best suited as it investigates actual usage of the information technology, and is the only constructivist approach to acknowledge the underlying intent of technology. The appropriation perspective allows the users to interact with the IT system in both anticipated and unanticipated ways. However, since ERP-systems are implemented to affirm specific goals within the adopting organization, variations in usage will most likely have an impact on how well the software is able to fulfill those requirements. Thus, the technology user’s interaction pattern with an ERP-system is accordingly not to be regarded as neutral.

Appropriation

Research on appropriation of technology was initiated by Poole and DeSanctis (1992), as an alternative to the more traditional deterministic models of explaining humans’ interaction with IT (Leonardi & Barley, 2010). The process of appropriating technology is seen as a social process in which structural features of the technology is produced and reproduced by human agency, drawing on Giddens’ structuration theory (Poole & DeSanctis, 1992). Salovaara and colleagues illustrated the appropriation of IT as facilitated by social learning amongst individuals (Salovaara et al., *accepted for publication*). They explored the many variations in which digital cameras was appropriated by the user to

serve as a mirror, a scanner, a memory stick, a source of light, or a periscope amongst other functions. All of these are excellent examples of how information technology is appropriated in manners which are deviating from its original purpose.

In concert with theorists advocating the concept of appropriation, we seek to emphasize the important role which technology user's actual interaction with the features of a novel ERP-system plays in achieving the intended organizational goals (Poole & DeSanctis, 1992; Chin et al., 1997). The distinction between users' appropriation and the developers' intent, leads us to an understanding of the technology's „spirit“. The technology's spirit augments beyond the structural features of novel technology, and captures the original intention held by the adopting organization (Poole & DeSanctis, 1992; Leonardi & Barley, 2010; Orlikowski & Robey, 1991). The apprehension of the spirit allows us to further evaluate the technology user's interaction with the ERP-systems in a bipolar scale measuring the deviation between actual use and the technology's spirit. This scale was proposed by Poole and DeSanctis (1992), and later developed by Chin and colleagues (1997) in order to capture the faithfulness of an appropriation, whereupon a large deviation would be an „ironic appropriation“ and a minor or no deviation would be a „faithful appropriation“.

Chin et al. (1997) recognized that there will be an objective spirit of technology, as defined by the adopting organization, and a subjective spirit of the technology, as interpreted by the technology user. Although the process of interpreting the technology will ostensibly to a large extent be guided by social process (Salisbury et al., 2002; Griffith, 1999, Weick, 1990; Fulk, 1993), we firmly believe there will be several conceptions of a technology's spirit co-existing within the organization and within organizational subgroups. Technology users could either have a limited understanding of the new software in general, constrict their attention to some elements of the complete ERP-solution, or they could inflate the magnitude of the system. Since the spirit of the technology is such an integral part of comprehending appropriation (Chin et al., 1997), too much variation owing to a subjectivity defined spirit could make any comparison between individuals or subgroups difficult. We have therefore taken the liberty to complement the subjective

interpretation of the ERP-system with other sources of knowledge through iterations. We will elaborate on this process when we are outlining the research case.

By employing the measurement scale „faithfulness of appropriation“, researchers have gained knowledge that augments beyond the decision of using or resisting novel technology. Appropriation recognizes the way users infuse alternative meanings to the technology, and consequentially use the technology in unanticipated ways (Leonardi & Barley, 2010; Griffith, 1999), similar to the findings made by Salovaara and colleagues (*accepted for publication*) in their study on repurposive use of digital cameras.

After the establishment of the faithfulness of appropriation measurement scale, subsequent studies have sought to explore organizational conditions which can function as antecedents for faithfulness in appropriating new IT solutions (e.g. Anson et al., 1995; Contractor & Seibold, 1993), but still there is much ambiguity in regards to why people appropriate technology as they do. We believe research on institutionalization could contribute to this end.

Institutionalization

Similarly to appropriation, institutional theories builds on social constructivist approach, and refers to the process where „templates of organizing“ receives support and legitimacy within a given institutional environment as being both appropriate and necessary components of rational organizing (Tolbert & Zucker, 1983). Templates for organizing could encompass organizational structure, routines and practices, patterns of actions embedded in human agency as well as technology and the use of corporate IT systems. The underlying idea is that any contemporary organization is part of an institutional environment, in which they are depending on legitimacy in order to “survive and thrive” (Scott & Meyer, 1994; Heugens & Lander, 2009). DiMaggio and Powell assert that “organizations compete not just for resources and customers, but for political power and institutional legitimacy [...]” (DiMaggio & Powell, 1983: 150). Legitimacy could be understood as a „license to operate“ and can be achieved by conforming to the prescriptions of powerful or influential actors in an institutional environment (Heugens & Lander, 2009). Hence, the search for acquiring legitimacy would over

time make populations of organizations increasingly isomorphic, as they are collectively defining and implementing more or less standardized templates for organizing (DiMaggio & Powell, 1983; Kostova & Roth, 2002). Constrained by a limited search space and a pressure to conform to the existing norms within the institutional environment, Birkenshaw and colleagues (2008) find managers to frequently acquire the most progressive and legitimate solution rather than tailor a solution to their specific requirements. This observation echoes the findings made by Meyer and Rowan, stating that isomorphism within an institutional environment will make organizations “[...] incorporate elements which are legitimated externally, rather than in terms of efficiency.” (Meyer & Rowan, 1977: 348). Furthermore, King and colleagues (1994) holds institutional forces to be a central tenet in understanding the diffusion of information technology innovations.

Institutionalization as a rhetorical process

The process of institutionalization can be salient on several organizational levels, including the individual micro-level. In this perspective, institutionalization is the process in which practices come to be cognitively and normatively taken for granted amongst organizational actors (Scott & Meyer, 1994). At the micro-level, institutionalization is essentially a rhetorical process, where organizational agents construct their reality through communication and interpretive/cognitive schemes (Heracleous & Barrett, 2001; Iederan et al., 2011). The cognitive schemas are a set of expectations toward a particular context, which guides the agents’ sensemaking process. According to structuration theory (Giddens, 1984), “[...] the interaction between communicative action and interpretive schemes is central to the construction of social reality, and thus to agents’ actions that are based on this reality.” (Giogia, 1986, as cited in: Heracleous & Barrett, 2001: 758).

The rhetorical processes is not constrained to how organizational agents communicate in a social setting, but also come into the way they think (Watson, 1995). Green et al. (2009) put forth that institutionalization is being embodied in the structure of agents’ argumentation used to justify the application of a practice at a given point in time. Changes in these argument structures can reflect to what extent the practice has been institutionalized (Green et al., 2009; Heracleous & Barrett, 2001). As Green and colleagues write, “[...] to rationalize is to give

discursive reasons for practices; to legitimize or institutionalize is to accept and take those reasons for granted.” (Green et al., 2009: 11). Following this strain of thought, the agents’ use of rhetoric related to explaining the application of a highly institutionalized practice would assume the existence of shared beliefs and leave out the underlying assumptions, as it would be redundant to state the obvious. By studying the content and structure of agents’ argumentation relating to the implementation of novel practices, it can enable researchers to discover how language and symbols reflects and shapes institutionalization (Green et al., 2009).

Toulmin (2003) expounds on the work of Aristotle which proposes a „syllogism“ as the fundamental way to understand argumentative structure. A syllogism consists of a major premise which is the overarching understanding, and a minor premise to explain the relation of the major premise to the particular situation, thus resulting in a claim. Similarly, Toulmin (2003) delineates between „ground“, „warrant“ and „claim“. Here the claim rests upon a particular ground, which may be normative, technical, or have other features that are warranted in some sort of ethos.

Ground	Large corporations benefit from integrating cross-functional business processes.
Warrant	ERP-systems streamline and integrate the scope of business processes
Claim	Large corporations benefit from implementing ERP-systems

Figure 1: Example of a syllogism

The main distinction made by Toulmin when compared to Aristotle is that Toulmin recognizes the mundane nature of everyday arguments. He proposes that not all arguments rests upon the syllogistic structure, but can rather have multiple structures, secluding central elements in the argument, such as grounds and warrants, leaving only the claim (Toulmin, 2003; Berente et al., 2011).

This change in structure of an argument supporting the application of practice should be observable in situations where a practice is gaining legitimacy and its application is becoming increasingly institutionalized (Green et al., 2009). An

argument structure in which the „warrant“ is not made explicit would indicate a moderate degree of institutionalization, as the speaker withholds information considered to be general knowledge. Arguments in which the warrant is omitted are called „enthymemes“. “Identification and analysis of enthymemes, and particularly their unstated and assumed premises, therefore, can enable researchers to uncover the taken-for-granted values and beliefs of actors in a particular social context” (Heracleous & Barrett, 2001: 762). Hence, a speaker’s preference for arguing in terms of enthymemes rather than syllogisms should emerge as the practice is becoming institutionalized.

Should the practice be highly institutionalized, the enthymeme is expected to be further broken down. The relationship between the claim and ground would diminish, leaving only an unsupported claim left (Green et al. 2009). The claim is assumed to be understood without any further rationalization (Berente et al., 2011), as the practice, at this point, is taken for granted to the extent where the claim has become a part of „endoxa“ – encompassing the commonly held beliefs and opinions of a discursive community (Green et al., 2009).

EXPLORING LINKAGES BETWEEN INSTITUTIONALIZATION AND APPROPRIATION

A highly institutionalized practice has acquired a position in which it is viewed as the legitimate and rational way of pursuing organizational effectiveness, and the system should therefore ostensibly be perceived as less equivocal. Researchers have found that when a practice is perceived as being revolutionary by virtue, organizational agents will have difficulties in adequately explaining in what way the practice can benefit the organization (Green et al. 2009). In fact they are more likely to express skepticism and unwillingness when they are arguing the value of a practice. Humans are often said to be animals of habits and order, and would protect themselves from elements which could upset this balance (Kreps, 1986 as cited in: Scott & Davies, 2007). However, if the practice is viewed as a “best practice” or normative in the immediate institutional environment, organizational actors can to a much greater extent formulate why an organization is adopting the new practice (Green et al., 2009). Standardized solutions based upon industry best-practices could in this sense guide the appropriation of the system to be more faithful to its intent, due to reduced ambiguity.

However, there is an alternative interpretation on how institutionalization could affect appropriation of an ERP-system. Several theorists have postulated that early adopters of innovative solutions emphasize the technical merits of a novel system, seeking to address a particular problem faced by the organization (e.g. Kostova & Roth, 2002; Green et al. 2009; Meyer & Rowan, 1977). Whereas, later adopters are found to be less prone to take an eager interest in the technical specifications of the practice, and will place greater emphasis on acquiring legitimacy by implementing the practice (Zbaracki, 1998; Lawrence et al., 2001). For late adopters, just acquiring the practice can become an end by itself, with little or no emphasis on how the practice will be incorporated later on, and to what extent it support business processes. In this respect the symbolic value of the practice can be seen as having supplanted the technical merits of the practice (Zbaracki, 1998).

Expounding on institutional theories, we believe the extent to which the application of ERP-systems are institutionalized will be related to how the system is being appropriated. To conclude, our theoretical review led us to formulate the

following research question. It is exploratory by virtue as the relationship between the constructs could be argued to be both negative and positive:

Can degree of institutionalization of ERP-systems at the micro-level explain variance in consecutive appropriation of the system, and will the degree of institutionalization be positively or negatively related to faithfulness of appropriation?

CHANGING TECHNOLOGY IN NRC: A CASE DESCRIPTION

NRC is a large Norwegian public corporation with more than 10.000 employees, responsible for most domestic passenger train operations. During the autumn and winter of 2011 NRC commenced the implementation of a SAP package solution circumscribing the company's HR practices across all its units and subsidiaries. We followed the change process as it emerged in NRC from early spring 2011 and throughout the summer of 2012.

The choice of ERP-vendor and solution was selected after a tender process where NRC evaluated each alternative in terms of price and how well the solution aligned with specified requirements. A project committee consisting of 20 managers and HR leaders, representing the corporation's different units and subsidiaries, was constituted already at this point to develop the requirements. The corporation chose to implement a standardized SAP HR solution and engaged an international IT consultancy company (ICC) to develop and implement the ERP-package solution. We had the privilege to collaborate with the ICC consultants and conducted several meetings where issues regarding the SAP HR project were discussed.

The HR module of SAP is encompassing features for registering payment, workforce planning, vacation planning and incumbents' knowledge and skill development which were all previously conducted manually. A large proportion of NRC employees are working non-regular office hours and shifts, placing high demands on the managements' ability to plan the employees' work schedules. Further, all train conductors and employees working within train maintenance must have up to date certified knowledge in order to carry out their work. The different processes were previously scattered throughout different support and leadership functions, leaving managers with a vast amount of processes to follow up. In addition, the previous procedures did not support a holistic HR strategy where data could be stored and reports could effectively be produced on demand.

By understanding the functionality of SAP HR we can start to approach an understanding of the technology's spirit in the concurrent implementation project.

Defining the technology's spirit through iterations

The process of defining the technology's spirit could in our case best be described as a hermeneutical process. We constituted an initial understanding of the technology's spirit by reviewing internal information such as presentations, documentation and progress reports. In the consecutive phase we used this knowledge when we discussed further the ERP-solution with the ICC consultants. This gave us an initial impression of the spirit of the technology, which was then applied as a baseline for assessing the respondent's appropriation as communicated in the interviews. During the interviews, new knowledge was attained, complementing our more objectively defined spirit of the ERP-system. We used this knowledge to adjust our own definition of the technology's spirit through iterations, constituting an inter-respondent understanding of the system. In total, this way of establishing the SAP-system's spirit can be considered as triangulating the construct as to elevate our understanding of the technology.

In the first step, we gained an understanding of the spirit through discussing with the implementation consultants from ICC. Here, an emphasis on uncovering technical specifications of the system and the goals it sought to affirm was imperative. The consultants described that the new SAP HR system had three central goals. Firstly, the system should reduce the application of manual processes, and replace them with automated processes. Secondly, the system should improve the quality of personnel data. Lastly, this data should be easily accessible for the management team and function as a baseline for decisions.

The increased use of automated processes facilitated by the SAP-solution was accentuated to reduce the amount of paper work, and avoid delays related to postal services. It would further give both the employees and the managers more transparency in the workflow and simplify the approval process. The SAP HR system was configured to follow a two-step decision-making system, where employees enter the data in the SAP-system, and their immediate manager review and handle the inquiries. As all data are being entered and maintained directly in the SAP-system, this should improve the data quality. The data will always be updated, and the employees are thought to take greater ownership to their

information in the system due to increased accessibility and a user-friendly portal interface. The data entered and maintained in the SAP-system should be easily accessible for all managers. The data will be standardized and enables data to be shared among the corporation's units and constitute a basis for management decisions.

Through the interviews, several individual conceptions of the technology's spirit were voiced constituting an inter-subjective spirit. We did allow this inter-subjective spirit to recursively adjust our underlying assumptions as stated above, thereby calibrating the technology's spirit to leverage the analytical integrity of appropriation as a construct. By triangulating the meaning of spirit, potential biases as held by either the consultants or the researchers would thereby be reduced.

Ironic Appropriation

The desirable outcomes of SAP HR will, as it has been argued, be contingent on a faithful appropriation amongst the technology users. With an ironic appropriation, we could expect adverse effects such as proceeding with the original manual process and use SAP HR in a somewhat ceremonial manner. This will not only lead to twice the work, but could also lead to more errors in pay-roll and increased uncertainty in vacation and staff planning. If the employees treat the data which is entered in the SAP application carelessly, the department which utilizes the information would then need to post validate the data – an additional ad-hoc activity which would render much of the potential gains of the IT solution obsolete. Relevant examples, as accentuated by the IT and transformation consultants leading the SAP HR implementation project, include situations in which pay-roll files have been processed twice, and the employees received one month's salary two times. The features of SAP HR which encompass employee skills and certificates would be of little value for workforce planning if the employees do not update their profiles with the relevant information.

The finalized SAP HR solution was rolled out in the corporation in a gradual approach, one unit at the time. The roll-out commenced in August 2011 and was implemented throughout all units and subsidiaries in December 2011. The committee which was constituted by NRC met frequently during the technical

implementation to share knowledge and concerns, and played an important role in engaging and involving the employees in their respective units to support the implementation of SAP HR.

METHOD

In May and June 2012, when some time had passed since the technical roll-out of the system, we started interviewing members of the project committee in order to understand the implementation process of the ERP-system, and how the system had consecutively been appropriated throughout the corporation. Reissman (1997) described narratives to “offer windows into personal experience, specifically human agency in the face of live events” (as cited in: Dutton, 2003: p.8). By encouraging the interviewee to speak relatively freely about the change process we were able to unravel some of the mystery circumscribing the implementation of ERP-systems.

In all, we conducted eight semi-structured interviews with members of the NRC project committee. All of the eight committee members we interviewed had managerial responsibilities in different units and subsidiaries within NRC. The interview was structured to encompass three major topics. The first topic revolved around the interviewee and their role in NRC and the committee group. The second part of the interview sought to explore NRC’s reasons for implementing SAP HR and the goals the system seek to promote, as perceived by the interviewee. In the last section of the interview, the interviewee was encouraged to tell freely about their interaction with the SAP HR system. The questions used in the two latter sections of the interview were grounded in theory on appropriation and institutionalization (See Appendix 1 Intervjuguide).

To assess the appropriation of the SAP HR software, we incorporated the items in the proposed measurement scale developed by Chin and colleagues (1997). The scale was empirically validated in an experiment setting where the group of respondents were engaged in utilizing a group decision making system, and subsequently were asked 11 questions capturing the appropriation of the technology. The survey sought to provide an accurate measurement of the appropriation, and the authors postulate that the questions can be used in both cross-sectional survey studies as well as a basis for a qualitative interview guide. In our interview design phase we choose the most relevant appropriation question from Chin et al. (1997) study and fitted them to our purpose.

We sought to establish the nature of appropriation through analyzing to what degree the respondent is utilizing the software in a way that is in concurrence with the technology's spirit. To this end we were particularly interested in the interviewees' stories relating to usage of SAP HR within their department, and how they reflected upon that usage. A central question was to ask the respondents if their units' interaction with the system could be categorized as ideal.

In order to analyze the degree of institutionalization at the micro-level, we applied Toulmin's (2003) analysis to capture the structure of the respondents' arguments. In line with our previous discussion we sought to recognize the use of syllogisms, enthymemes and independent claims when the respondents are arguing the benefits of SAP HR. By juxtaposing the interviews we detected variation in how the respondents structured their arguments. What was being said during the interviews carried great importance, but what was not articulated carried even greater importance.

Interpreting the Interviews

All interviews with members of the project committee were recorded and transcribed in its entirety. All the transcribed interviews mounted to 64 pages.

The process of coding the interviews was done in a cyclical manner to decrease potential individual biases (Silverman, 2008; Fisher, 2010; Berente et al. 2011). The transcriptions were scrutinized, and argument structures were highlighted and interpreted according to Toulmin's framework. Here we searched for clues in the interview where the respondents were discussing and contemplating what goals NRC sought to affirm by implementing SAP HR. Appropriation was established through a discussion of relevant experience and examples provided by the interviewee, and then juxtaposed to the defined spirit of the technology.

FINDINGS

In the following sections we will present the main findings from each of the interviews in a unit-centered analytical approach in order to acquire a holistic understanding of each interview and its embedded meaning. The eight respondents in our study represent seven different units within NRC. In order to ensure the anonymity of the respondents the units are named Unit A, Unit B, and so forth. In the discussion we will summarize the findings and discuss overall patterns, to see if we can draw any inferences across the sample.

Unit A

The first interviewee was conveying a story of a transition process from the perspective of a fully owned subsidiary within the corporation. The interviewee, being a member of the project committee, projected a picture of her organization deliberately choosing to seclude itself from the process. When we asked the respondent if she were involved in the process of designing the requirements of the system, she replied to have taken no part in the process due to lack of time.

The respondent emphasized that when they purchased the new SAP-system, it was predominantly motivated by the need for a new system to replace the old one. The organization was in her opinion, not seeking to realize some economic or efficiency goals, rather they were hoping to standardize their human resource processes with a system which was relatively widespread. Mainly, this was due to the difficulties experienced in maintaining the old system as the organization was too dependent on a small number of experts.

Claim	“Since nobody were maintaining the old system, a new system had to replace it”
Ground	[Explicit] By not having a widespread system, the organization became too dependent on external suppliers to operate the former HR system.
Warrant	[Implicit] By implementing what the respondent is calling a “standard” system, maintenance difficulties as previously experienced could be circumvented. The system is viewed as standard in large corporations, and should therefore be easier to operate.

Figure 2: Argument structure unit A

The argument structure applied by the employee in this interview was characterized as an enthymeme rather than a syllogism, due to the warrant being implicit, and hinges on some shared beliefs between the speaker and the audience. She is thus expecting the listener to intuitively understand SAP HR to be a widespread solution, and how this again should transcend to a less cumbersome process of maintaining the system's functionality. We can thus interpret a partial institutionalization relating to the practice of implementing SAP HR.

After describing the process which led up to the acquisition of SAP HR, the respondent avidly explained how the subsidiary organization had managed to put the system into use. Being a focal point for the employees in her organization, she had several stories relating to the reception of the system.

“Most of our employees were very happy when they first logged on. They had so much information available! I think once you get people in, they will find that this new tool is very useful”

She described the new processes as carried out in SAP, and expressed great satisfaction in how the HR processes became more streamlined. When we inquired into her interpretation of the aims the system was implemented to affirm, she claimed that the benefits of having SAP HR were predominantly realized in other NRC units, leaving the role of her organization to simply make use of the system. Within her organization she could not recall any events of unexpected nor overly passive interaction with the system. The appropriation of the system can thus be said to be faithful towards its intent.

Unit B

In line with the respondent in Unit A, our next interviewee was also a member of the project committee and had volunteered to meet us in order to discuss the concurrent transition to SAP. After observing the impressive scenery from the building's top floor, our interviewee quickly traced the conversation to the implementation of SAP HR. She expressed great interest in the interplay between the different systems utilized in NRC, and discussed the integration between the new HR system and their existing finance solution. The respondent accentuated some concerns regarding the approach taken by NRC, which was to some extent in contrast to what she considered to be the normal approach.

She postulated that NRC would benefit greatly by having both the HR and yhe Finance solutions integrated in one packaged solution. To this account NRC is using two different ERP vendors. The interviewee drew parallels to other companies, suggesting that the norm is to have one ERP-system covering most applications needed by the organization. “Most companies that have SAP HR are also using SAP Finance [...]”. The respondent further proposed the implementation of ERP software to follow a typical pattern in organizations, starting with the HR module, and subsequently expanding to encompass an increasing number of processes. We found that the respondent often referred to what is considered normal amongst other large corporations, which could be understood as NRC’s institutional environment, and that ERP solutions are representing the norm.

Claim	“Often SAP HR is only the beginning, and then you add on more and more modules of SAP.”
Ground	[Implicit] Integrated cross-functional SAP systems are the norm amongst large corporations.
Warrant	[Implicit] A larger and more integrated system generates positive outcomes for large corporations. The same positive outcomes should be expected in our organization.

Figure 2: Argument structure unit B

The argument structure used to promote the advantages with SAP HR is fragmented and obligates the listener to provide the underlying ground and warrant. The argument is resting, implicitly, upon the comparison of how other large corporations are reaping benefits from having implemented holistic and integrated SAP solutions to cover most business processes. The seclusion of both a ground and a warrant proposes the practice of implementing SAP HR solutions to be highly institutionalized.

The interviewee explained the goals of the system is to allow managers throughout the company to have greater control and access to information in all HR related issues. However, she did not agree to the accentuated aim of achieving greater organizational effectiveness as promoted by the system.

“Are we really becoming more effective overall by deleting central governing bodies for sick leave and pay-roll? Now the line managers have to assume more administrative roles, so overall I think we are just moving work around.”

We found that the respondent was torn with respect to degree the system delivers on the goals which it should. On the one hand she has found SAP HR to provide increased control and access to information, but she does not consent that the system promotes overall efficiency to NRC. However, the intent of the system is in stark contrast to her observations relating to the movement of administrative work. The system seeks to provide the managers with personnel responsibility greater flexibility in carrying out their concurrent personnel responsibilities and streamline the approval process. The respondent is ostensibly not realizing the full potential of the system.

The appropriation we found to be partly faithful to its design as the depicted process is followed by all incumbents, without any exceptions to circumvent the new workflow.

Unit C

The conversation in our next interview stood in stark contrast to the image of SAP HR as being a widespread solution to deal with information requirements in large corporations. The interviewee explained the process as he had experienced it, and crafted an image of a successful implementation.

“I think SAP is working well. I use it frequently and I believe that”s the clue. Then there is no problem.”

The interviewee was aware that organizations sharing a comparable task-environment are using similar solutions as SAP HR, but the respondent was not under the impression that it is common, or in any way that the application of SAP constitutes the norm for how large corporations handle their information requirements.

Claim	“We save ourselves a lot of manual routines and paperwork.”
Ground	“Instead of writing, sending, and filing paperwork, I can approve overtime and vacations, sick leave etc, in the system. Then the rest of

	the process will be directed to payroll without any paperwork at all.”
Warrant	[Explicit] SAP HR benefits the organization by standardizing routines and thereby eliminates several potential sources of error. At the same time it is flexible enough to give the manager greater convenience in following up pending approvals in a timely manner.

Figure 2: Argument structure unit C

When we analyzed the discourse by applying Toulmin’s framework, we found little evidence of SAP HR acquired qualities which are taken for granted. Rather, the respondent explains thoroughly how the system is contributing to his organization by emphasizing its technical attributes. The argument is structured as a syllogism, where both the ground and warrant is stated explicitly supporting the claim.

After describing his work environment and the responsibility he has been delegated in the SAP transition, the interviewee poured himself another cup of coffee and explained how he had been interacting with the system. He has urged his unit to follow the new process as stipulated by the SAP system, and explained how he did not permit any of his employees to carry out the old process. He indicated some minor resistance to the change within his organization immediately after the technical roll-out, but that the resistance subsided as soon as the employees got used to the new system. They are now accessing the SAP-system actively to download pay-checks, apply for vacation and submit work-hours.

In accordance with the system’s spirit, he has appropriated the system in a faithful manner.

Unit D (respondent 1 and respondent 2)

“Obviously, with more than 5000 employees there will be deviations.” Our first respondent in unit D was stressing the importance of delineating between essential and less essential processes as promoted by SAP HR, and postulated that it would be unrealistic to expect a faithful appropriation across all features encompassed by the system. The respondent was positive towards the implementation of SAP HR, but would have preferred to see more results.

“One has created some solutions which may not be quite ... they are not quite functional.”

The respondent was well aware of the technical possibilities an ERP-system can offer, and expressed disappointment in that NRC chose to implement the standard solution, which in his opinion was a bit too simplistic to meet the organization’s demands.

“I am critical towards our choice to implement only a limited version of SAP. When you first go ahead and buy an ERP solution you should go all the way.”

Claim	“We have finally decided to implement an ERP-system to handle this kind of processes [...]. It’s an excellent idea – to have all processes in one system.”
Ground	[Implicit] An ERP-system which encompasses all processes related to human resource management and interrelated information management produces superior outcomes compared to non-integrated systems.
Warrant	[Implicit] The technical specification of the system enables the superior performance for the conditioned processes, provided that the organization manages to integrate different modules in the ERP-system. Success is not bound to crown the efforts of simply acquiring the system.

Figure 2: Argument structure unit D (respondent 1)

The interviewee is using a rhetoric argument structure, which leaves out all but the claim itself. The argument has collapsed into a self-explanatory claim without any need for further extrapolation. The practice seems to have acquired a status where its application is taken more or less for granted, and can thus be said to be institutionalized.

The interviewee emphasized that although the system in his opinion have superior technical merits as opposed to the older systems they were using, NRC is not fully capable of reaping the full benefits provided by SAP HR. He believed that the organization needs to implement more modules encompassing financial control, maintenance, customer relationship management etc. Although the respondent rejects the idea that his organization is using the system in an optimal manner, he

emphasized that it is owing to technical limitations rather than the manner in which his unit appropriated the software solution.

Our understanding of the technology’s spirit and the provided features in the SAP HR-system suggests that the respondent, to some degree, is inflating the scope of the concurrent solution. He continued the interview by describing how the system provided positive changes in the task-environment he shares with the other employees in his unit. The technology contributed to up-skilling the employees’ roles and they were accordingly willing to appropriate the majority of the system’s features in a faithful manner.

Our second respondent within Unit D holds a management position and has been a part of the SAP HR committee since the technical implementation phase commenced in August 2011. During the interview he shared his concerns regarding the direction the project has taken.

“...I am experiencing a lack of commitment, both in terms of long-term goals, and in that one has chosen not to explore technological solutions in order to understand the possibilities residing within the system.”

Claim	“Frankly speaking...I think the approach taken here was more like; <i>This is very elegant, we want it</i> ”
Ground	[Explicit] Compared to what similar organizations are doing, there has not been done enough research to formulate the intention of acquiring the SAP HR portal in NRC.
Warrant	[Implicit] NRC has hastily bought a much too complex system, which they do not comprehend well enough to use as efficiently as similar organizations.

Figure 2: Argument structure unit D (respondent 2)

When we discussed the commonality of ERP-systems amongst large corporations, the HR leader agreed to the widespread use of such systems. To this he added:

“[...]but, then they [other corporations] implement it [SAP HR] is because of a strategic goal. They implement the portal because they want to achieve something...I do not observe the same approach here.”

The quote is interesting in that he regarded the use of SAP HR to be fairly common amongst other organizations, and secondly, because he claimed that NRC acquired the system ostensibly without any strategic goal. The respondent frequently used „similar organizations“ as a benchmark to evaluate the implementation of SAP HR in NRC, indicating that system is fairly common in NRC“s institutional environment.

When we further encouraged him to share his beliefs as to why he thought NRC acquired the SAP HR-system, he responded that he has not perceived any clear vision or intention with the system. Seemingly, the system“s symbolic value can be interpreted as having supplanted the technical merits of the system, to use Zbaracki“s (1999) terminology. The interviewee observed much work to have been placed down during the technical implementation of the system, followed by an absence of ownership after the technical roll-out. This could signalize a motivation for acquiring legitimacy by adopting the system, but a lack of interest in reaping the benefits of the system in the consecutive phase.

“I think the intention was to acquire a payroll system. In that case we have the certificate to ride a light motorcycle and bought a Ferarri”.

Although the interviewee had great difficulties in pointing towards explicit goals for the SAP HR system, he was certain that NRC is not using the system in an optimal manner. He claimed rash decisions were made during the initiation of the project, and that the consequences of those decisions were only discovered after the technical roll-out. For this reason, Unit D is facing some difficulties in reporting, due to a constricted set of available accounts. Some extra work is also being done as the transmission of data is not properly validated from SAP HR to the corporate finance system. The respondent used the metaphor of acquiring a really nice garden, but at the same time ignoring any need for maintenance. At which point the garden will live a life on its own. Without any further involvement in the SAP-system and visible ownership to the solution he fears the system too will live a life on its own, and that technological opportunities will be left unused.

The concept of a technology“s spirit can seem to be an elusive concept when the drive for achieving legitimacy is more prevalent than any technical goals. That is, when the goal is fulfilled by the mere acquisition of the technology, rather than by

utilizing it for organizational benefits. However, we still find the concept of appropriation to be a meaningful construct to assess, by asking the respondent whether he believed the SAP HR system is used in an optimal manner. To this question he answered without any hesitation that he believed the system could offer NRC much more than what is the current state of affairs. However, it would be unjust to categorize the appropriation as being ironic, as the technology is not used in unexpected ways, or in ways which are at odds with the spirit of the technology. In this case, there is rather a lack of willingness to explore all the possibilities the system provides, and it would in this sense be premature to label the concurrent appropriation as being either faithful or ironic.

Unit E

The respondent in Unit E has been part of the project committee since the initiation of the project.

The respondent explains that throughout the process, the project group responsible for purchasing an ERP-system was skewed towards choosing SAP as a preferred system. Amongst others, she described this as being due to SAP having standard solutions that enables rapid deployment of the system without making individual adjustments to account for the variation in different departments. This was a prevalent problem in their previous HR solution, where any upgrade would entail large costs related to these individual adjustments.

Claim	“We had to become more effective. [...] We have too many systems scattered around, and I think it is unfortunate for an organization of our size”.
Ground	[Implicit] SAP HR will make large organizations more effective and streamline business processes.
Warrant	[Implicit] By implementing SAP, NRC will experience enhanced effectiveness and standardized process among all units. As other large corporations are reaping these benefits, the same must be true for NRC as well.

Figure 2: Argument structure unit E

When we probed further into NRC's reasons for adopting the system, she articulated the need for standardization and indicated that SAP is a rather widespread mean amongst large corporations to organize their processes.

"[...] and I think it was about time that we introduced a self-service portal. Seemingly ... it is just the way it has become".

We interpret the meaning of this statement to indicate that by the implementation of the SAP-system, NRC will be able to acquire legitimacy in its institutional environment, and meet internal expectations.

When she later on extrapolated on the benefits SAP provides the organization, the discourse seems to indicate that the benefits are somewhat taken for granted, and requires little supportive argumentation. Hence, she expected these benefits to be a shared conception, and part of our endoxa. She regarded the solution as being "standard", or to be configured upon best-practices for the industry.

The main goals as stated by the respondent were to modernize the processes related to human resource management. Previous processes were largely manual by nature, utilizing pen and paper blanks to apply for vacation or registering overtime payment. The paper diagrams were subsequently manually entered into the old payroll system by a separate department. The respondent expressed the frustration the old system could evoke within the administrative unit: "We were literally drowning in application blanks!". An additional and equally important goal for the new SAP HR system was to increase information accessibility and standardize data for reporting purposes across organizational units and subsidiaries. The respondent reflected over the information availability for the employees in the following manner:

"People are gradually becoming more and more familiar with always being able to access mail and other stuff online, so I think it's in due time that we also offered a self-service solution to our employees for their HR data. I think people have come to expect this type of information availability".

Throughout the interview the respondent demonstrated a thorough understanding of the goals the new system sought to realize. She further expressed great satisfaction towards the way the new system handled these tasks:

“I use the system every day [...] SAP has become my primary tool in my job, and of course it is a challenge to learn a new system entirely. But I really like it!”

On the other hand, when she discussed the challenges they encountered throughout the implementation process, the interviewee described an appropriation pattern which was at odds with the technology’s spirit. The respondents outlined many cases where managers entered data in the system on behalf of their employees, in accordance with the old routines. This would obsolete the potential gains in terms of process efficiency.

The overall goal congruence between the technology’s spirit and the self-assessed usage can be characterized as fairly faithful to its design.

Unit F

In the following interview, the process of acquiring the system could best be described as an organization conforming to a centralized decision. The consecutive appropriation of the SAP system was sometimes in direct conflict with the intended goals of the system. The interviewee, being a member of the project committee and a manager within Unit F, expressed frustration when she summarizes the series of events which constituted the change process as it unfolded.

Due to the lack of involvement and ability to influence, she found the new SAP HR system to be ill-suited to cover areas as necessitated by her organization.

“How are we supposed to use SAP HR to do work-force planning on our operating personnel? The system does not have a good enough module for this type of planning.”

Ostensibly, Unit F implemented SAP predominantly to avoid sanctions, as the interviewee postulated that her organization would be better off upgrading the former system rather than implementing SAP HR.

Claim	“Well...in our case this [implementing SAP HR] will be more expensive, and I am certain that we will lose money. ”
Ground	“When we realized how „big-business oriented“ this system was, we realized we had to transfer many tasks to our payroll unit”

Warrant	“We pay for the services we are outsourcing to the payroll unit”
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Figure 2: Argument structure unit F

The respondent made very few insinuations pointing toward a commonality of using SAP HR, and she explained that there were no expectations internally in favor of replacing the old system. The interviewee based her claims regarding the negative utility SAP HR brought to her organization, by assessing the technical merits of the system. We find no evidence in her discourse, suggesting that the practice has been institutionalized. The subsidiary manager criticizes the lack of necessary features in SAP HR to carry out their processes in an efficient manner, and seem to find relatively few positive aspects associated with it.

“The goals? I think they were communicated, but the decision was made from the top of the hierarchy, we did not have a say at all.”

When we further probed into the appropriation of the system, and asked her if she thought the system was used in an optimal manner, she ardently replied that “It is not possible for the leader to follow up the employees in the way the system proposes.” Delineating from the intention of the system, this particular organization has chosen to let the incumbents run old processes simultaneously, thus avoiding the new two-step decision-making process as stipulated by SAP HR. Circumventing features and processes as proposed by the system is in direct conflict with the spirit of the technology. They have rather engineered a way to work around the new reporting lines rather than appropriating the system according to its original intent, which could foster both additional work, and potential payroll related errors. The appropriation is therefore characterized to be of rather ironic nature.

Unit G

In unit G concerns were being voiced, that the SAP HR system was not living up to its full potential. The interviewee has been part of the project committee since the constitution of the group and agreed to meet us to discuss the progress of implementing the SAP-system. She experienced substantial resistance towards the new system in the initiation period, but it subsided shortly after the roll-out. However, the personnel manager reveals a sense of disappointment toward the

finalized solution, as it did not quite meet her expectations in terms of functionality.

The respondent made several references to the importance of being in pace with technological advancements in the environment. In this respect she regarded ERP-systems as a relatively widespread solution for managing HR activities in large corporations. “We must keep pace... and it is contemporary to have it [SAP HR]”.

Claim	“We were supposed to move from a payroll-system to a HR-system. And, if you are implementing a HR-system according to the natural development of technology, you should then have a portal [...]”
Ground	[Implicit] Following the recent development of sophisticated and novel IT solutions, ERP-systems represent the natural choice for future-oriented organizations to manage their human resources.
Warrant	[Implicit] New IT-solutions are superior to old IT-solutions.

Figure 2: Argument structure unit G

The argument structure used by the interviewee has collapsed from a syllogism into an independent claim. As we have argued, the seclusion of any ground or warrant in the argument structure could suggest that the practice of having a SAP HR solution is institutionalized to the extent where the speaker sees no point in providing support to her claim.

The interviewee made it evident from the very beginning of the interview that the SAP HR system was far off from meeting her expectations. As a large proportion of her workforce are shift workers, the unit has for many years used combinations of excel spreadsheets, different IT-systems, and tools to manage the workforce planning, and reporting of work hours. SAP was meant to obsolete the need for all these ad-hoc tools and make the portal the only entry point for both employees and managers. However, the subsidiary is now situated in a situation where SAP HR is complementing rather than replacing an already large variety of systems. She explained with animation and frustration that the system is not capable of handling the more complex procedures of registering and schedule shift-plans. Neither is the system meeting her demands regarding a competence database.

“It [SAP HR] has become a quite advanced payroll system as it is now. Not much more than that. We have to make much progress in order to get a real HR-system”

The subsidiary is currently only making use of the electronic distribution of paychecks and requesting vacation. All work time registration is outsourced to another division in direct contrast to the purpose of self-service software. However, this is owing to the technical attributions in the SAP-software, and not the unanticipated use of the IT solution. Again, we find an example where the interviewee reports the utilization of the portal to be curbed from its full potential, although, the technology users are interacting with the technology according to the technological spirit. The only evidence of ironic appropriation stems from reporting difficulties within the new system. She explained the many difficulties of using the information from SAP HR for reporting purposes, as the information is yet not accurate enough to support any strategic decisions.

Table of findings

In the following table we have summarized the relationships between the degree of institutionalization and nature of Appropriation across our sample. The constructs have for the purpose of comparison been standardized into four point continuums, ranging from no institutionalization – low degree of institutionalization – moderate degree of institutionalization – high degree of institutionalization, and ironic appropriation – partly faithful appropriation – fairly faithful appropriation – faithful appropriation. Ambiguous appropriation is in this comparison used to depict usage that have not yet crystallized itself, and could thus not be standardized into one of the categories.

Unit	Institutionalization	Appropriation
Unit A	Moderate degree of institutionalization	Faithful
Unit B	High degree of institutionalization	Partly faithful
Unit C	Low degree of institutionalization	Faithful
Unit D (respondent 1)	High degree of institutionalization	Fairly faithful

Unit D (respondent 2)	High degree of institutionalization	Ambiguous
Unit E	High degree of institutionalization	Fairly faithful
Unit F	No institutionalization	Ironic
Unit G	High degree of institutionalization	Ambiguous

Figure 2 Table of findings

DISCUSSION

In congruence with previous findings by Barley (1986) and later Orlikowski (1996), we find the ERP-system in our study to have spurred a variety of differing interaction patterns across units and agents within the Norwegian Railroad Corporation. When we analyzed the interviews conducted with members of the project committee, the interpretation of the technology's spirit deviated greatly, and has ostensibly guided the technology users to interact with the technology in different manners. The different appropriation patterns are salient in terms of which functions in the SAP-system the technology users are applying for data entry, and how this data is used for reporting purposes and decision making.

“We can not trust the data...trust that the sick-leave numbers are correct [...]”
- *Manager in Unit G*

“I observe people register vacation days twice, and mix up dates in a way that affects the balance. It is a challenge getting the managers to read and validate the data in an efficient and correct manner.” - *Manager in Unit E*

The concerns which are voiced in regards to the accuracy of reports could be a result of human error as described by the manager in Unit G, or reflect general skepticism toward the reporting utility in SAP HR. Other interviewees have accentuated reporting difficulties due to poor integration between SAP HR and other corporate systems. However, this concern was not shared across our sample of interviewees. A manager in a different NRC unit explains how the input in SAP HR is effectively integrated with the corporate e-mail system, to submit automatic e-mail notifications.

“We receive automatic notifications when employees' certificates are close to expiration, directly to outlook” - *Manager in Unit D (respondent 1)*

In the process of entering data into the SAP-system, we found the different units to apply different methods. Some respondents communicated that their unit were following the new reporting-lines and entering data according to new procedures, while others had engineered novel ways of operating the system, and thus circumventing its original purpose. The new two-step validation of data, where the technology users enter the information and their immediate manager reviews and handles inquiries, is an integral part of the change in procedures following implementation of SAP HR.

In our study a SAP HR system was implemented with the intention of integrating the scope of cross-functional HR processes within the corporation. And, as a process oriented IT platform the aim of integration will to a large extent hinge on the extent to which these processes are carried out in a rather homogeneous and reliable manner. Consequently, usage will not be neutral. Appropriation of technology is unique in this respect as it allows us to compare use-related behavior in relation to the system's intent. To this end, interviewees proved to be well suited to capture stories of how technology-users are explaining and reflecting upon how they are interacting with the system.

The wide variety in use-related interactions with the new ERP-system suggest appropriation of technology to be a useful construct in order to evaluate how the system is put to use. While all units are using the system due to corporate requirements, the routines and practices connected to the usage of the system is carried out in different ways.

Institutionalization and how it is related to appropriation

Our aim of this study was to investigate the viability of using institutionalization as a rhetorical process to explain variation in consecutive appropriation. It has been argued in our literature review, that the institutionalization of a practice, which in our study refers to the corporate use of ERP-systems to facilitate HR-related processes, holds the potential of influencing the consecutive appropriation of the system by two contrasting means.

As argued, practices which are highly normative and legitimate within an institutional environment may be adopted by an organization without any specific goals, other than meeting internal and external expectations (Green et al. 2009; Kostova & Roth, 2002; Zbaracki, 1999). On the other hand, the widespread use of a highly institutionalized practice may reduce the ambiguity concerning the application of that specific practice.

In our study, we did not find strong support for either of the relationships, but some patterns emerged in our findings. In the event where the practice of using SAP was highly institutionalized, we found examples which could indicate the implementation to be an end in itself.

“[...] but, then they [other corporations] implement it [SAP HR] because of a strategic goal. They implement the portal because they want to achieve something...I do not observe the same approach here.” - *Manager in Unit D (respondent 2)*

In this particular interview, the respondent expressed frustration regarding the lack of corporate ownership to the SAP HR system. While the implementation was carried out in a prompt and agile manner, he calls for more leadership embodiment in the consecutive phase of putting the system into use. Similar concerns were voiced in other interviews:

“It is evident, that there perhaps has been a small void after the project was completed”.
– *Manager in Unit D (respondent 1)*

“Standard, standard, standard [...]. We had one goal at hand, and that was to implement a standardized package solution”
– *Manager in Unit E*

These stories correspond well with the „institutional argument“, putting forth that early adopters tend to customize new technology, whereas late adopter tend to conform to new technology (Zbaracki, 1999; Westphal et al., 1997). In addition to the shared perception of implementing a highly institutionalized practice, these respondents also shared the idea of NRC not being able to realize the full potential in the SAP HR system.

“[...] And that’s why I expected more. That this would not only be a payroll-system. We already had that. Now we were supposed to implement a HR system to guide our efforts of improving organizational development.”
– *Manager in Unit G*

“We are a small group of persons within this unit who can make use of SAP HR to its full extent. It has been an expensive investment for our use.”
- *Manager in Unit F*

“I think the intention was to acquire a payroll system. In that case we have the certificate to ride a light motorcycle and bought a Ferrari”
– *Manager in Unit D (respondent 2)*

The general trend across our findings suggests that respondents who indicate the practice of corporate ERP-systems to be highly institutionalized are prone to appropriate the technology in a less faithful manner than the other units in our sample. This is not to say that they appropriated the SAP system ironically, but

that the degree was rather partly faithful or fairly faithful to its design. This reflects interaction patterns where some processes are omitted or carried out somewhat inefficiently.

In contrast, when the degree of institutionalization was low or moderate, indicating a commencing process of institutionalizing the practice of corporate ERP-systems, we found the appropriation to be faithful. This was evident in Unit A and Unit C, where the respondents argued the value of an ERP-system in terms of syllogisms and enthymemes, leaving less of the information implicit. We believe this could provide further support for the institutional argument.

“Instead of writing, sending, and filing paperwork, I can approve overtime and vacations, sick leave etc, in the system. Then the rest of the process will be directed to payroll without any paperwork at all.”

– *Manager in Unit C*

The manager argued explicitly how his interactions with the system supported the technology’s spirit. In the above quotation we can see how he is reflecting on the system’s utility and how it gives him flexibility to efficiently execute any pending actions in the system. He explains how this reduces potential errors, previously posed by the use of manual routines and paper blanks. The reduction of manual processes, and the improvement of data quality are both central in the defined spirit of the system.

In Unit F, we found the only appropriation of the SAP-HR-system to be ironic. Correspondingly, this was also the only unit where the respondent did not at all perceive the practice to be institutionalized. During the interview the respondent described the implementation process to have been somewhat forced upon them, which could also influence the consecutive phase of putting the system to use. The respondent rejected the idea of SAP being a common solution for corporations to facilitate HR-practices. The respondent made several references to the former system, and expressed dissatisfaction with replacing it. This observation supports the idea of institutionalization as a mean to overcome inertia. However, to draw any conclusions based on only one observation of an ironic appropriation pattern would obviously be premature.

When a practice receives legitimacy in its institutional environment this could reduce the agents' skepticism towards the novel practice. On the other hand, when a practice becomes highly institutionalized it could potentially hamper the organization's ability to appropriate the system in an optimal manner. This is in accordance with observations made by Zbaracki (1999), Green and colleagues (2009), Westphal et al. (1997), and Meyer and Rowan (1977).

Organizational Sensemaking in the change processes

Initiating organizational change is often accentuated to be a virtue of leadership, both in order to reduce the ambiguity rising in the wake of change and serving as a sensegiver providing meaning for the employees (Gioia & Chittipeddi, 1991). Enactment theory holds interlocked behavior to be an important mean of reducing equivocality, highlighting the importance of understanding how social dynamics can illuminate attitudes towards organizational change and its outcomes (Weick, 1969). Furthermore, the rhetoric utilized is heavily contingent on the inherent sensemaking present in any organization. Technological advances have often entailed change, and new ERP-systems are no exception. Winner notes: "The point at which technology is introduced is the point at which it is most susceptible for influence." (Winner, 1986 in: Weick, 1990: 21). The respondents in our study have spent considerable amounts of time together through their participation in the project committee. This interaction should consequently present opportunities for interlocking behavior and converge the sensemaking process. In turn, the rhetoric utilized in our sample may be more homogenous through this process, reflecting strong influence from sensegivers or dominant coalitions. Leaders have been found to affect the subordinates attitudes and commitment to major changes in an organization (Leonard-Barton & Deschamps, 1988; Yukl, 2010; Bennebroek Gravenhorst & Boonstra, 1998), including organizational changes relating to ERP implementations (Bingi et al., 1999; Lewis et al., 2003). Here we believe that the role of sensegiver may entail a huge influence over the process of creating conception of goals towards the appropriation of technology, and converging institutional rhetoric. This effect was observed in Berente and colleagues (2011) study on sensemaking on second-world software, where the respondents strongly converged around two particular argumentative warrant characteristics.

Lüscher and Lewis (2008) explored the role of middle management in sense-making for an organization re-engineering business processes. They found that middle management often is expected to function as catalyzers for the change processes. This role entails both making sense of communication from executives, while simultaneously directing and providing sensegiving for their subordinates. The researchers find that this can prove to result in anxiety, and attenuate decision making related to conditioned processes (Lüscher & Lewis, 2008). One of our respondents summarized her role in similar fashion:

“We have received little information from the decision-makers of what the new solution will handle. In our role we are supposed to transmit these inputs into our own unit, seeking to create the right expectations for our organization.”
- *Manager in Unit G*

In all, the members of the project committee are expected to both make sense of the strategic intent instilled upon them by executive management, while serving as catalysts for the overall progress of the implementation. As postulated above, their role will by virtue enable them to influence their subordinates’ sensemaking process by functioning as sense-givers.

LIMITATIONS & FUTURE RESEARCH

As previously stated, our intended contribution of this study was to investigate the viability of utilizing the rhetorical process of institutionalization to explain consecutive variations in appropriation. Due to the nature of the study, we cannot conclude any causal relationship between the constructs, or quantify any covariance measures.

Our research project was conducted in collaboration with ICC. Although this cooperation yielded a unique opportunity to grasp both the intention and the actual usage of the new software, our ability to freely select respondents were somewhat hampered. This resulted in a convenience based, rather than a randomized sample. Moreover, the respondents voluntarily participated in the study, and useful information from those who elected not to participate was potentially lost. In review, these features of our sample may have skewed the results.

To fully understand the process of appropriating new ERP-technology, future research would benefit from conducting longitudinal studies. Further research on appropriation of ERP-technology should also seek to understand the process of sensegiving within the organization, and inquire into how the perception of an institutionalized process can be transmitted and shaped by organizational agents.

CONCLUSION

In this study we carried out a social constructivist research agenda, seeking to explore how institutionalization as a rhetorical process could influence appropriation patterns of ERP-technology. In our case study, we found a tendency, in support of the „institutional argument“, proposing that the symbolic value of a highly institutionalized practice could supplant the technical merits of the practice. As the acquisition becomes an end in itself, we found consecutive appropriation to be less faithful towards its intent. However, when the practice was not at all institutionalized, it appeared that the organizational actors were even less prone to faithfully appropriate the new technology, and assumed a position of skepticism and inertia. The organizational actors who conveyed stories of a faithful appropriation were seemingly those who perceived the practice as being partly institutionalized. That is, the organizational actors are providing discursive reasons for rationalizing the application of the ERP-system, which has yet not been taken for granted.

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Appendix 1 Intervjuguide

Intervjuguide for NRC

Vi ønsker å undersøke den pågående endringen som påfølger en teknisk innovasjon. Det betyr at vi er interessert i høre mer om hvordan jobbportalen til NRC blir benyttet i ulike sammenhenger og hva du opplever som verdiskapende med systemet.

Dette trenger ikke å begrense seg til tekniske spesifikasjoner, men hva slags elementer ved systemets utforming du kan ta i bruk i din jobb. Systemets tekniske utforming kjenner vi til, og ønsker å forstå hvordan dette blir tatt i bruk.

Nye tekniske løsninger medfører endringer, noen umiddelbare endringer og noen endringer som skjer gradvis.

Hva er din rolle i NRC?

- Hva er din rolle i referansegruppen for implementeringen av jobbportalen SAP HR?
- Hvordan fikk du denne rollen?
- Hva er referansegruppens funksjon som helhet?

Kan du fortelle mer om hvordan du har opplevd overgangen til jobbportalen?

- I dine egne ord, hvorfor mener du NRC iverksatte implementeringen av jobbportalen SAP HR?
- Hva slags reaksjoner på jobbportalen har du observert i din avdeling?
- Er det noen grep dere har gjort i endringsprosessen som har vært spesielt nyttige?
- Hva var de største utfordringene med å implementere jobbportalen?

Hvilke tekniske utforminger av systemet har du brukt?

- Føler du at disse funksjonene i jobbportalen støtter NRC sine mål for å implementere systemet?
- Kunne du bruke systemet i henhold til målene til NRC?
- Kunne det vært brukt på en bedre måte?
- I din avdeling, føler du at selvbetjeningssystemet blir brukt på en optimal måte?

English translation:

Interview guide for NRC

We seek to explore the current ongoing change that follows a technical innovation. This means we are interested in hearing more from you on how the NRC „job portal“ is being utilized in different context, and what you experience as value driving in the system.

These drivers are not necessarily technical specification, but also what elements of the system design that you feel contribute to your job role. We have already a fairly good conception of the technical features of the system, and now we want to learn how you have put it to use.

Typical for implementation of new technical solutions is that it entails some sort of change, some occurs immediately and others are more gradual in nature and emerge as the system is put to use.

What is your role in NRC?

- What is your role in the project committee?
- How did you get this role?
- What is the function of the project committee?

Could you explain how you have experienced the transition to SAP HR?

- In your own words, what do you believe is the reason that NRC purchased SAP HR?
- What kind of reactions have you observed towards SAP HR in your unit?
- What has been the biggest challenge when migrating to the new solution?

What technical specifications of the system have you used?

- Do you find these functions to support the goal that NRC had for implementing SAP HR?
- Are you able to utilize SAP HR in accordance with the goals that NRC has set for the system?
- Could the system have been used in another way?
- In your unit, do you think you are using SAP HR in an optimal manner?