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Motivational Factors For IT Compliance With A Mandated IS: The Case Of A University

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MOTIVATIONAL FACTORS FOR IT COMPLIANCE WITH A MANDATED IS: THE CASE OF A UNIVERSITY

Research full-length paper

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Abstract

Theory of IT adoption relies on the concept of users' choice. However, a substantial part of IT implementations is aimed at mandating adoption where usage is compulsory and non-usage has consequences. In these cases, full IT compliance is strived for, but seldom achieved. Previous research suggests that different patterns and relations assert itself in mandated settings. Thus, the factors influencing IT adoption (and IT compliance) in mandated settings are not the same as in voluntary settings. The existing literature however fails in identifying the motivational factors for IT compliance with a mandated IS. So far the discussion has to a large degree been reduced to what works best: carrot or stick? In this paper we extend the current literature of IT adoption for cases of mandated use. We do so by drawing on a case study of a mandated IS in a public university. This paper provides an initial framework for mandated IS that includes three contextual factors and five motivational factors which, in this case study, affected the level of IT compliance with a mandated IS.

Keywords: Mandated IS, IT compliance, Motivational factors, Education.

1 Introduction

The use of Information Systems (IS) is growing rapidly in organizations, and organizations that successfully adopt the right IS evolve their productivity and competitive positions (Dwivedi et al., 2015). Due to the costs associated with systems development, a substantial part of these IS are mandated (Liang, Xue, & Wu, 2013). A mandated IS is one where users perceive use as organizationally compulsory (Brown, Massey, Montoya-Weiss, & Burkman, 2002). However, no system use is totally mandatory as the use of the IS might vary in quality and intensity (DeLone & McLean, 2003). After top management has made a formal decision to adopt an IS, the employees are responsible for integrating the IS into their job routines, and the initiative may fail if the employees refuse to do so or use the IS in unintended ways (Leclerq, Carugati, Giangreco, da Cunha, & Jensen, 2009; Xue, Liang, & Wu, 2011). Therefore, management often seeks IT compliance with the mandated IS and has the prerogatives to enforce it if necessary (Da Cunha & Carugati, 2013). IT compliance, a relatively new concept, can be defined as: *"the extents to which employees follow organizational IT policies to appropriately use the target IT in their job"* (Liang et al., 2013, p. 280). To achieve compliance, employees must use the IS in accordance with policies and standards (Liang et al., 2013).

Mandating an IS does not guarantee compliance in practice (Carugati, Fernández, Mola, & Rossignoli, 2016); the existing literature shows that many factors contribute to the nonuse or misuse of mandated IS (e.g. if the IS is perceived as a threat or if the practices enforced by the IS are at odds with familiar job routines (Liang et al., 2013). Motivation (for using an IS) can broadly be classified as either extrinsic or intrinsic. Extrinsic motivation is reinforcement of the value of outcomes, whereas, intrinsic motivation is the performance of an activity for no apparent reinforcement other than the process of performing the activity (Davis, Bagozzi, & Warshaw, 1992). An example of extrinsic motivation is being told to do something, whereas enjoyment is an example of intrinsic motivation. Motivational factors (i.e. factors enhancing the motivation) have been widely researched within the domain of non-mandated systems (Brown et al., 2002; DeLone & McLean, 2003) for example with the technology acceptance model (TAM) (Davis, 1986). However, the research on mandated systems suggests that different patterns and relations assert itself in mandatory settings due to the higher level of focus on extrinsic motivation; showing that different motivational factors influence the level of IT compliance with a mandated IS (Brown et al., 2002). However only few studies have engaged in this discussion; the literature has so far studied this issue on a high level, focusing largely on whether to use carrot (motivation) or stick (punishment) in order to ensure IT compliance (e.g. Liang et al., 2013; Xue et al., 2011). This paper therefore focuses on the following research question: What are the motivational factors for IT compliance with a mandated IS?

These factors are explored through a single case study conducted at a faculty at a Danish university adopting an administrative IS for digitizing the process of handing in and correcting exam papers. Management considered this IS as an innovative step towards a greener (paperless) and more efficient exam process. Universities are educational institutions where legislation and the government play a major role in goal setting and decision-making, thus being highly influenced by mandated regulations (and mandated IS) (Gross, 1968; Pollock & Cornford, 2004; Seeber et al., 2015). The university is an organization with a bureaucratic structure, where individualism and hierarchy affects the culture and working environment. The individualism among the academic staff members and the high level of intrinsic motivation influencing their work creates a special culture at the University. Therefore indicating, that achieving IT compliance with a mandated IS in a University may be proven to be more difficult than in private settings.

The remaining paper is organized as follows: section 2 outlines the theoretical background of mandated IS adoption. Section 3 describes the case study method and the case, while in section 4 the analysis of the motivational factors found in the case is presented. Finally, the findings are discussed and concluded on in section 5.

2 Mandatory Information Systems

The study of the factors leading to the adoption of IT as prescribed is one of the hallmarks of IS research. Seminal articles as Davis (1986) and DeLone and McLean (2003) became seminal exactly on the promise that tuning a limited number of parameters (chiefly usefulness, ease, system quality, and information quality) would lead to system usage and consequently organizational success. The main feature of these models is voluntarism; managers and organizational sanctions are not part of the models and employees are thus “free to choose”. This freedom may be relevant for systems that users acquire for their own personal use but it is very rare for organizational systems which use is mandated. The TAM has been extended to mandatory systems showing that organizational control and norms are significant factors in the behavioral intention to use a system. They can even be more significant than other system characteristics (Brown et al., 2002). While Brown et al. (2002) opened up this discussion, they do not focus on the origin of control and norms nor did they investigate possible conflicts between the two.

When introducing organizational control and norms in the adoption of IT, the relation between managers, employees, and technology becomes important. Managers assume an important role in the adoption process and have the prerogative to control work and how work is done. Managers can incentivize various objectives about achieving goals or following procedures or both (Da Cunha & Carugati, 2013). They may decide on practices and how these practices support external policies (e.g. laws and regulations) and may also decide how strict or relaxed their control should be and may even trade between achieving objectives and respecting procedures (Ferneley & Sobreperéz, 2006).

Existing norms are likewise important in the adoption of new technology. In an early article, Tyre and Orlikowski (1993) highlighted that alignment between IT, norms, and change style during periods of change is part of the success of an IT implementation. However, norms can also be at odds – and often are – with the practices encoded in the new mandated IT (Kobayashi, Fussell, Xiao, & Seagull, 2005). If there is no alignment, employees can respond with behaviors that deviate from the expected. When there is a mismatch between the practices encoded in IT and norms, employees may respond with workarounds by deviating from set procedures (Ferneley & Sobreperéz, 2006). Kobayashi et al. (2005) define a workaround as: ‘informal temporary practices for handling exceptions to workflow’. While workaround as a response is well documented in the literature, the reasons behind workarounds are less clear. Some literature describe this as response to inadequate IT where operators deceive their managers in order to reach their goals (Sobreperéz, Ferneley, & Wilson, 2005). Other studies (Da Cunha, 2013) conclude that, managers play a key role in actively guiding their employees to perform workarounds in order to obtain their own goals. Both situations are likely, and models of adoption of mandatory IS need to include the relation between managers, employees, and technology to provide a comprehensive picture of the adoption dynamics. This dynamics may change in relation to whether IT records work automatically or not, and on whether managers implement close scrutiny of work and work objectives or not.

One dimension that affects management scrutiny is connected to whether a technology automatically records employees’ activities or not. Some systems are intimately connected with work processes and therefore will both collect information about the work done and the objectives reached. In cases where work is formatted in such way, managers are users of the information that IT produces automatically from work (Shoshana, 1988). This is the typical case of technology to support production systems. Employees use a certain IS during their production work and managers receive reports after the work is completed. In these cases managers can decide to act after the fact to reprimand the employees when needed.

Other systems are used to collect information after the work is completed. The systems are used by the employee to maintain a record of the work done, but this record is created manually by the employee. Systems like these are found in work situations where the execution of work is not dependent from IT. We find examples of this in healthcare and similar (Jensen & Aanestad, 2007). In this second catego-

ry, the managers need to make an active effort to both monitor reporting practices and the results reported in the system (Da Cunha, 2013).

Employees using mandated systems will find themselves juggling multiple demands and demands that are not always visible to them. In the first case, employees will not know how much or when managers look at the data reported in IT. In the second case, employees will be in doubt on how the management style will change from manager to manager or from time to time.

The resulting employee behavior with mandated systems is therefore a complex combination of application of managerial prerogatives, work practices, and technology. Understanding this behavior is one of the core and persistent problems in IS research (Weber, 2003) and further investigation of this question for mandated systems is therefore the objective of this paper.

3 The Case Study Method

This is an interpretive, single case study (Klein & Myers, 1999; Walsham, 1995, 2006) with the purpose of acquiring in-depth insight to the social phenomenon of achieving IT compliance. The case study design was combined with the Grounded Theory Methodology (Strauss & Corbin, 1994) where the purpose is to develop theory based on a thorough analysis grounded in the data. This does not entail a blank slate (Urquhart & Fernandez, 2006), rather an open mind is recommended (Urquhart, Lehmann, & Myers, 2010). Data collection, data analysis and consultation of existing literature were therefore done iteratively in three phases from February to April 2016 (table 1). The search for literature followed the guidelines of Webster and Watson (2002) including a key word search as well as forward and backward search.

Phase	Data collection	Participants	Documentation	Analysis
1	Observation of seminar	15 academic staff members from one department and the Department Deputy Head	Video recording, central passages transcribed	Open coding in Nvivo
2	Questionnaire	89 answers from academic staff members	Google forms was used for setting up the questionnaire	Open coding in Nvivo and statistical analysis
3	4 qualitative interviews	2 associate professors, the Department Deputy Head and 1 IT administrator	Sound recording, full transcriptions	Open, axial and selective coding in Nvivo

Table 1. Data collection and analysis

3.1 Observation of the seminar

Observation of specific organizational situations is a central data collection method within qualitative research assisting in gaining insight in the observed person’s work environment and positions (Eriksson & Kovalainen, 2008). An observation of a seminar was conducted in the first phase of the data collection. The seminar was organized by the Department Deputy Head to inform about the status of the system as well as to gather and share experience after the system had been used for a short period. All academic staff at the faculty received an invitation for the seminar, however only 15 participated.

The observation was designed as obtrusive (the academic staff were aware that they were observed), unstructured (no observation objects were designed), and non-participant (the observers did not participate in the seminar) (Eriksson & Kovalainen, 2008). The purpose of the observation was to identify academic staff members’ positions and attitudes towards the implementation of the IS. The seminar was video recorded, central passages was transcribed and coded using open coding to identify early structures and categories for focus in the further study.

3.2 Questionnaire

The questionnaire was based on the findings from the observation. The analysis of the seminar showed how the majority of the participants were frustrated and argued why they refused IT compliance. The questionnaire was therefore designed to give a broader perspective of the level of compliance and to examine the reasons for compliance or non-compliance in more depth. The target group was academic staff, which all had the possibility to participate anonymously. The questionnaire consisted of 36 mainly unstructured, qualitative questions in order to gain a broad but still deep insight to the issue. An example of an unstructured question is question 8: “Describe your experiences with the process going from handling exam papers manually to handling exam papers digitally.” 11 structured questions were also included with the purpose of covering and showing more general tendencies; an example is question 32: “To what degree do you believe it was necessary to digitize the exam process?”. The respondents were given a five point scale from strongly agree to strongly disagree. The process of conducting and evaluating the questionnaire was carried out iteratively to improve the quality of the questions; this process included four pilot tests of the questionnaire. The questionnaire was drawn up in Google Forms and sent by email to the employees at the faculty, where 89 academic staff members answered the questionnaire. The empirical data was subsequently processed and analyzed in Nvivo through open coding.

3.3 Four Qualitative Interviews

The qualitative interview is the most important and most popular tool for data collection (Myers & Newman, 2007); in this study it was used to gain a deeper knowledge of the tendencies in the questionnaire and also to detect yet uncovered areas. Thus the third phase consisted of four qualitative semi-structured interviews with an IT administrator, a Department Deputy Head, who had taken charge on the adoption process, and two associate professors from two different departments representing the academic staff. Three semi-structured interview guides were created; one for the IT administrator, one for the Department Deputy Head, and one for the two associate professors. The interviews were initiated by open-ended questions to create a greater wealth of detail (Eriksson & Kovalainen, 2008).

This data was coded in Nvivo. First, by open coding identifying overall challenges of the adoption process. Second, by axial coding to create categories consisting of the factors influencing the IT compliance (e.g. communication and ease of use), where these categories were based on the rich amount of unique codes developed. And finally, selective coding was used to identify the different types of factors (e.g. contextual and motivational), and describing these factors influencing the level of IT compliance.

3.4 The Adoption Process in the Case

This is a case study of how a Danish university implemented an IS to innovate the handling of exam papers. This was initiated by the Danish Agency for Digitization developing a digitization strategy for public institutions in Denmark, including the universities. They did this in order to respond to the environment and to support progress and development in the public sector. A key objective of this strategy is that universities must offer exams that match the digitized society, hence adapting exam forms to fit the future work that the students will encounter in their careers, and thus prepare them for the challenges they face. The Danish Agency of Digitization therefore aims at making the administration of exam papers digital and at providing software enabling university teachers to correct the papers directly on their computer or tablet (The Danish Agency of Digitization, 2016).

In order to comply with the digitization strategy a faculty at a Danish university decided to implement an administrative IS for handling digitized exam papers ahead of the strategy. The faculty consists of seven departments with approximately 1,050 employees, of which 700 have the title Academic Staff. This faculty has 13,600 students while the entire university has 36,500 students. The academic staff

members do both research and teaching; a significant part of their work was therefore affected by the adoption of the IS and the changes in the exam process.

The decision to be the first faculty to implement the IS was made due to a disagreement with the rest of the university about the time schedule for the implementation. The original plan was to implement a streamlined IS at five of the top universities in Denmark, but due to the long-term project plan the faculty believed that this plan was unrealistic and that the implementation and the need for change in the exam process were urgent. Hence, the faculty decided to implement and adopt an already tested IS to match the digitized society as soon as possible.

The IS was developed to handle digitized exam papers, both the process of students handing in the papers and the process of the academic staff correcting them. The system was aimed at providing an efficient, modern way of handling exam papers and at enabling an automatic plagiarism check at the same time while reducing the amount and use of paper. The system allows correcting and commenting papers in two ways. One way is that each exam paper can be opened in the built-in annotation tool for reading and commenting where comments are saved in the document. Another option is to download one or several PDF files containing the exam papers saving them on a computer and/or tablet. The files can then be printed or read in a tool of the user's choice. The annotation tool in the first version of the IS was very low on functionality, and management therefore distributed tablets to the majority of the academic staff members. A specific application for download was recommended; this could be used for reading and commenting the papers. Another key functionality of the IS was the grading of the papers and/or oral exams. The academic staff members had to enter each student's grade into the IS thus reporting the grades through the system. However, at the very beginning there was a significant need for grading on paper besides using the system due the fact that the system did not support all types of exams, e.g. group exams. These insufficient functionalities were continuously solved.

4 Findings: Motivational Factors for IT Compliance

The analysis showed how several factors have influenced the level of IT compliance in the case, resulting in a framework (figure 1) that shows how three contextual factors influence five motivational factors. The first motivational factor: 'a mandatory IS and managerial pressure' influenced the level of IT compliance directly, while the rest of the factors focus on intrinsic motivation, which influence the attitude towards the IS. The attitude then influenced the level of IT compliance.

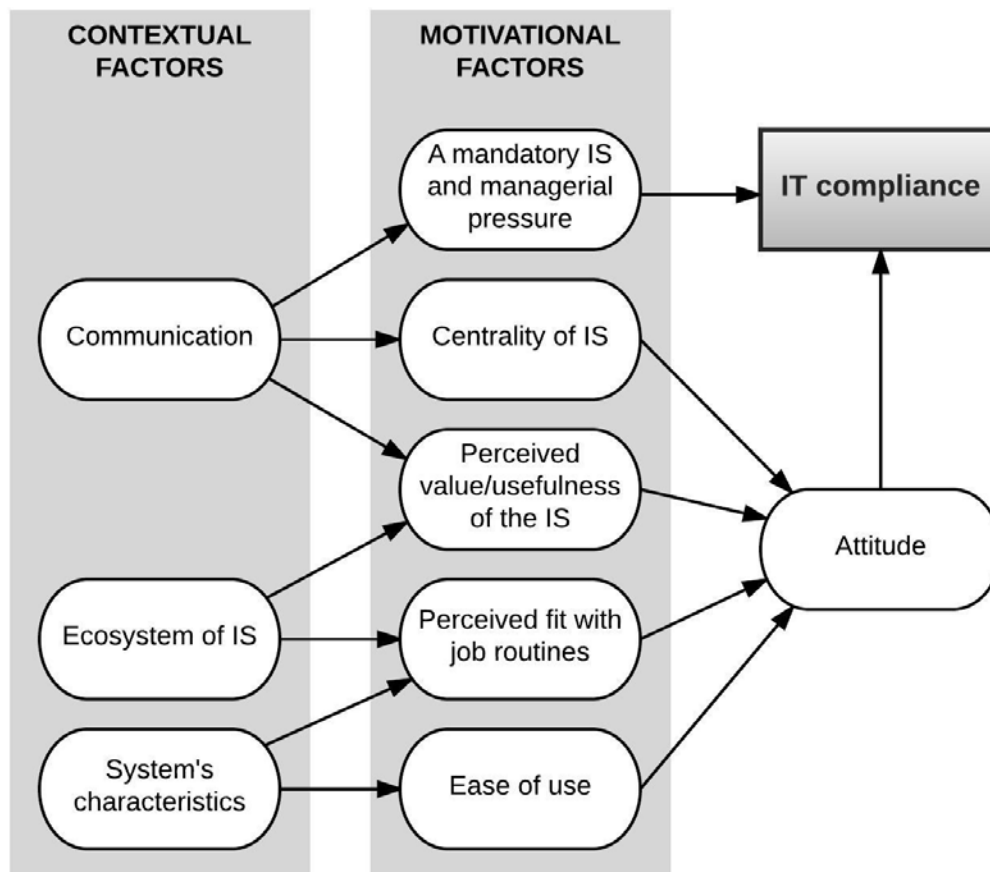


Figure 1. The Motivational Factors Identified in the Case of a Danish Public University.

The following section presents the analysis of the case in terms of level of IT compliance achieved, the motivational factors and the contextual factors.

4.1 IT Compliance in the Case Study

The Department Deputy Head, who had a central managerial role in the adoption process at one department, expressed general satisfaction with the way the IS had been received by the academic staff. However, he also referred to a group of staff who was averse to the IS and likely would never use the IS as intended. From his point of view, the biggest resistance towards the new system was reflected in the fear of existing job routines being changed, and in some of the academic staff members needing to acknowledge that the system supposedly offers a much more effective and cost-minimizing way of correcting and assessing exam papers. One quote describes this: “Some people just jump into it and says; well okay, that is how we do today, without any doubts and then we have the individuals, who will never be a part of the progress and in ten years they will probably still talk about the good old days where everything smelled of ink.” (Interview with Deputy Head of Department).

The analysis showed how the majority of academic staff members perceive the IS as a great initiative, where 57% answered that they agree or strongly agree that it was a necessity to digitize the exam process, and how they in general feel motivated using it – but also how the level of compliance varies substantially between individuals. A very few individuals are unconditionally positive and see the digitization as totally unproblematic, only 30% percent agree or strongly agree that the new system fit their work tasks. The positive arguments for the IS and digital exam papers, found in the data, are: 1) it is easier to access the papers online both new and old papers and it removes the piles of papers in the

offices 2) the automatic plagiarism check makes it easier to catch cheating, and 3) forces more structured comments, which makes the feedback session more efficient. However, at the other end of the scale 29% of academic staff members had a negative or very negative attitude towards the system after it was implemented, showing great resistance. The questionnaire showed three general reasons why a significant amount of academic staff members found it easier to print the exam papers. 1) It is perceived more difficult to gain an overview of longer exam papers 2) too much time is already spent in front of a screen doing other work tasks, which may result in physical pain, and 3) the time for reading and annotating a paper is increased. One quote describes how a respondent focuses on the increase in time: *“I would like to underline, that it is not an unwillingness to read electronically that demotivates me, but my experience that shows that it takes longer to read digitally and the fact that it is frustrating that I am not able to use my preferred learning preferences.”* (Respondent of questionnaire).

Several academic staff members for example still prefer printed versions of the exam papers and chooses to print them (either themselves or by having a secretary doing it) before grading the papers. In total 41.8 % of the respondents of the questionnaire answered that they prefer to print the exam papers and correct them manually. They do this despite the fact that printing the papers is time consuming and that they overall expresses motivation for using the system. This also despite the purpose of the IS that strives for a digital, paperless exam process and despite the managerial directive to read and annotate the papers either by using the functionality incorporated in the IS or by using the tablet and application provided. This conflicts with the purpose of the system and shows how full IT compliance has not been achieved. Based on these findings we did an analysis focusing on which factors that has influenced the different level of IT compliance in this case.

4.2 Motivational Factors

Table 2 summarizes five motivational factors identified in the case and their influence on the IT compliance. Each motivational factor is then described in further detail.’

#	Motivational Factors	Influence on attitude and IT compliance
1	A mandatory IS and managerial pressure	High, positive
2	Centrality of IS	Slight, negative
3	Perceived value/usefulness of the IS	High, positive
4	Perceived fit with job routines	High, negative
5	Ease of use	High, positive

Table 2. Motivational factors in the Case.

1. **A mandatory IS and managerial pressure:** This factor proved to influence the level of IT compliance positively. As there was no alternative provided, the academic staff members were forced to try using the IS and several staff members, who preferred to read papers manually, realized how it was possible (and reasonable) to do it electronically. Answering a question why one read and annotate in their way of choice (in this case digitally), several have answered in the following way: *“There was no other alternatives than to use it”* (respondent of questionnaire). Some of these persons would not have tried reading papers electronically if the IS had not been mandatory. The IS also entailed new control mechanisms enforcing university rules: e.g. that exam papers must be graded within four weeks after the exam. The IS enforces this rule, as the exam papers only are available during a set period and the academic staff members are not able to change these dates themselves. They must therefore apply for a prolonging of deadline at higher university levels. This process can both entail shaming and threats if they tend not to comply with this rule, a rule that had not been uphold as fiercely before the IS was implemented. This forces the academic staff members to act within the policies of the university to a higher degree. There is no evidence in this case showing that this factor influenced the staff members’ attitude towards the IS.

2. **Centrality of the IS:** The work tasks of the majority of the academic staff members include both research and teaching. Though, many of them enjoy teaching and take great pride in giving high quality teaching, the majority see research as their main work task and do not want to spend more time on teaching-related activities than necessary. The Deputy Head of Department said: *“Some of my colleagues, they do well in teaching and such, but to them there are many other more fun things to do”* (Interview with Deputy Head of Department). The culture at the faculty is characterized by individualism and focus on own interests more than focus on the interests of the university as a whole. The fact that the IS supported teaching activities rather than aspects of the research that the staff found interesting had a slightly negative effect on the attitude towards the IS.
3. **Perceived value/usefulness of the system:** In this case the value of the IS and its advantages are highly acknowledged and the majority of the academic staff members believe that the IS can help enhance parts of the job performance. Especially the fact that the system makes it possible to do an automatic plagiarism check will enhance the exam evaluations. The digital papers are furthermore easier to transport and to gain access to from several different locations (e.g. the home office). In the questionnaire the advantages were summarized by one of the respondents: *“I think it's much easier to have everything available online whenever you want to access it. We're no longer storing huge piles of old exam papers in our offices. It's easy to access old exams. There are automatic plagiarism checks. Comments to use during feedback are structured and readily available.”* (Respondent of the questionnaire). The overall perceived value of the system can therefore in this case be categorized as high. Even the staff members who are resisting the system still see the benefits of it showing how this factor does not influence the IT compliance directly, but only influences the attitude.
4. **Perceived fit with job routines:** Several academic staff members believe that the IS and the digitization of the exam papers require radical changes in their job routines. For some the digital papers entail a new way of making annotations and notes. It takes longer for several academic staff members to read and to annotate the papers digitally and they find it much harder to gain an overview of the papers; this however depends on the type of exam paper. Shorter papers (typically from 3 or 4 hours onsite written exams) are not that difficult to read digitally as they are faster to go through and do not require much annotations for feedback. However, longer papers (such as bachelor and master theses) pose a greater challenge as cross-references through the papers are needed and the annotations must be elaborate in order to prepare for the oral defense and feedback session. An associate professor said: *“a main problem is, that we don't distinguish between types of exam papers. There is great difference in correcting a master thesis written by 2, 3 or 4 people, 120 pages and 500 pages of appendix and then correcting a short written assignment or a for example 4 pages essay”* (interview associate professor 2). Some staff members even state that there is a higher risk for making mistakes and that it is more inconvenient to handle digital papers during an oral exam. The fact that job routine changes are required is not surprising as the purpose of this IS was to revolutionize the handling of exam papers rather than supporting the existing job routines. This factor has proven to highly influence the staff members' attitude towards the IS in a negative direction.
5. **Ease of use:** The overall complexity of the system is low; use can be reduced to downloading one or more files with the exam papers in PDF and then open it in one's preferred software for reading and annotating. Very little training in using the new IS was offered, however, the academic staff showed no interest in such training finding it unnecessary due to the low complexity of the IS. One respondent of the questionnaire wrote: *“I cannot remember being offered any training, but I would not have participated because I did not find the system difficult to use.”* (Respondent of the questionnaire)

4.3 Contextual Factors

The analysis also indicated how three contextual factors affected the motivational factors: 1) communication, 2) ecosystem of IS and 3) system's characteristics.

- The **communication** from management influenced the perceived value/usefulness of the IS, the perceived fit with job routines, and was used to emphasize that the system was mandatory. Though several academic staff members argued that they had not received enough information about the system from management. A cross reference of the answers in the questionnaire showed that the academic staff members who were satisfied with the level of communication tended to be highly motivated for using the IS.
- **Ecosystem of IS:** The interplay between the various possible systems gives users a greater opportunity to use the system as they wish, however still within the policies laid down by management. Several of the academic staff members chose to add other tools such as tablets and appertaining applications (as recommended by management) to enhance the fit with existing job routines, creating an eco-system of IS. This factor also had a positive influence on the perceived value/usefulness, as it is the interplay with another system, which makes the plagiarism check possible.
- The **system's characteristics** (e.g. complexity and quality of the IS) influence the perceived fit with job routines and ease of use. The overall quality of the IS in the case was satisfactory, but as the faculty was first mover on implementing the IS, the implementation gave rise to some challenges. For instance, the IS was not equipped for the many different types of exams (e.g. group reports). Some of the resistance towards the system arose due to these issues. However, as the overall complexity was low, the ease of use was very high.

5 Discussion and Conclusion

This paper studies the motivational factors that are likely to influence the level of IT compliance in the adoption of a mandated IS. The main contribution is the framework (figure 1) describing potential motivational and contextual factors, which in the case study of the adoption of a mandated IS in a Danish university influenced the level of IT compliance. In this section the relevance of the key factors are discussed according to findings of previous studies.

The well-known Technology Acceptance Model (TAM) states that the factors *perceived usefulness* (and value) and *perceived ease of use* influences a user's intention to use an IS and will influence usage behavior (Davis, 1986). The TAM has been widely used and evaluated in the domain of voluntary system adoption where its validity has been acknowledged (Brown et al., 2002; DeLone & McLean, 2003). One study, which focused on the relevance of TAM for mandated IS, found that different patterns of relationships assert themselves, that the TAM relationships provide limited explanation of acceptance and that the model may be misleading (Brown et al., 2002). In line with this Xue et al. (2011) found that the perceived value/usefulness was insignificant in mandated settings. Our case study supports this fact, as the perceived value/usefulness of the IS was high, even among the staff members who showed low IT compliance. The case study also showed how the ease of use had an insignificant influence on the IT compliance, as the ease of use was very high, but the level of IT compliance rather low. The case study thus showed how the two factors of the TAM were high, but the full acceptance of the IS was low, proving that these factors are not as central in mandated settings as in voluntary settings. The findings of this paper therefore suggest the following:

Proposition 1: Perceived value/usefulness and perceived ease of use are not the key motivational factors for IT compliance with mandated IS.

The fact that the IS in the case study was mandated and that management pushed the use of the IS (and policy compliance) influenced the level of IT compliance directly. Previous research on the adoption of mandated IS also suggests that extrinsic motivation such as punishment is the main factor ensuring IT compliance (Liang et al., 2013; Xue et al., 2011). Punishment and ‘punishment expectancy’ are found to be more effective than motivation (Liang et al., 2013). Xue et al. (2011), however conclude, that the perceived justice of punishment (that is, employees perceive the policies of the organization to be fair) is more important than punishment expectancy. This case study showed how most of the academic staff members found the policies and the implementation of the IS fair, but this was not enough to ensure full IT compliance, thus in this case the punishment expectancy had a higher influence. Nevertheless, the findings of this paper suggest the following:

Proposition 2: The fact that an IS is mandatory and the managerial pressure to use the IS influence the IT compliance directly, suggest that extrinsic motivation is central in mandated settings.

The other factors identified in the case study influenced the attitude towards the IS, the staff members were reluctant towards using the system primarily because of a perceived low fit with job routines. The attitude towards the IS therefore indirectly influenced the IT compliance. Previous studies has argued that the attitude only to a low degree influences the behavior of the users (Brown et al., 2002). We suggest that while these factors may not be primary in mandated setting, they do still have a substantial influence. (Brown et al. (2002)) suggest that the role of these factors is to encourage positive attitudes about use and that a negative attitude may influence an individual’s perception of the whole organization, thus the consequences may be far reaching.

Proposition 3: Factors enhancing intrinsic motivation influence employees’ attitude towards the IS, management and organization, thus having an indirect influence on the IT compliance.

Studying the adoption of a mandated ERP system Amoako-Gyampah and Salam (2004) focused on extending the TAM and found that training and communication influenced the perceived benefits of the system and indirectly the acceptance of the IS. In line with these findings, this paper also found that communication about the project may influence several motivational factors. Due to the very low complexity of the IS in this case, training was not an issue. We do however acknowledge that training plays a role when adopting a more complex IS such as an ERP. Besides from communication, two other contextual factors were identified: 1) system’s characteristics and 2) ecosystem of IS. In the case study flexibility of use were created through an ecosystem of IS which mitigated negative issues of the IS (e.g. low fit with job routines). The eco-system of IS gives the user the choice of preferred tool or tools and ways of solving the work tasks. Thus, suggesting the following:

Proposition 4: Implementing an eco-system of IS can enhance flexibility of use and strengthen the fit with job routines as well as the perceived value/usefulness of the IS.

This study therefore shows that the motivational factors for IT compliance in mandated settings cannot be explained by previous models (such as TAM). The extrinsic motivation in the form of management pressure plays a key role and influences the level of IT compliance directly. The attitude towards the system (influenced by the factors creating intrinsic motivation) proved to play a smaller, but still a substantial role. We therefore suggest that future research engage in understanding different aspects of how to exert extrinsic motivation in an efficient way. How to create an effective eco-system of IS which supports the attitude and behavior of the employees is also an area, which has not been researched.

References

- Amoako-Gyampah, K., & Salam, A. F. (2004). An extension of the technology acceptance model in an ERP implementation environment. *Information & Management, 41*(6), 731-745.
- Brown, S. A., Massey, A. P., Montoya-Weiss, M. M., & Burkman, J. R. (2002). Do I really have to? User acceptance of mandated technology. *European Journal of Information Systems, 11*(4), 283-295.
- Carugati, A., Fernández, W., Mola, L., & Rossignoli, C. (2016). My choice, your problem? Mandating IT use in large organisational networks. *Information Systems Journal*.
- Da Cunha, J. V. (2013). A Dramaturgical Model of the Production of Performance Data. *MIS Quarterly, 37*(3), 723-748.
- Da Cunha, J. V., & Carugati, A. (2013). *Systems of transfiguration and the adoption of IT under surveillance*. Paper presented at the International Conference on Information Systems (ICIS), Milan, Italy.
- Davis, F. D. (1986). *A technology acceptance model for empirically testing new end-user information systems: Theory and results*. Massachusetts Institute of Technology.
- Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1992). Extrinsic and intrinsic motivation to use computers in the workplace. *Journal of applied social psychology, 22*(14), 1111-1132.
- DeLone, W. H., & McLean, E. R. (2003). The DeLone and McLean model of information systems success: a ten-year update. *Journal of management information systems, 19*(4), 9-30.
- Digitization, T. D. A. o. (2016). Digital Universities. Retrieved June 8th, 2017
- Dwivedi, Y. K., Wastell, D., Laumer, S., Henriksen, H. Z., Myers, M. D., Bunker, D., Srivastava, S. C. (2015). Research on information systems failures and successes: Status update and future directions. *Information Systems Frontiers, 17*(1), 143-157.
- Eriksson, P., & Kovalainen, A. (2008). *Qualitative Methods in Business Research*. London: Sage.
- Ferneley, E. H., & Sobreperéz, P. (2006). Resist, comply or workaround? An examination of different facets of user engagement with information systems. *European Journal of Information Systems, 15*(4), 345-356.
- Gross, E. (1968). Universities as organizations: a research approach. *American Sociological Review, 5*18-544.
- Jensen, T. B., & Aanestad, M. (2007). Hospitality and hostility in hospitals: a case study of an EPR adoption among surgeons. *European Journal of Information Systems, 16*(6), 672-680.
- Klein, H. K., & Myers, M. D. (1999). A set of principles for conducting and evaluating interpretive field studies in information systems. *MIS Quarterly, 23*(1), 67-93.
- Kobayashi, M., Fussell, S. R., Xiao, Y., & Seagull, F. J. (2005). *Work coordination, workflow, and workarounds in a medical context*. Paper presented at the CHI'05 Extended Abstracts on Human Factors in Computing Systems.
- Leclercq, A., Carugati, A., Giangreco, A., da Cunha, J. V., & Jensen, T. B. (2009). *A sociomaterial view of the scaffolding of work practices with information technology*. Paper presented at the International Conference on Information Systems (ICIS), Phoenix, Arizona.
- Liang, H., Xue, Y., & Wu, L. (2013). Ensuring employees' IT compliance: Carrot or stick? *Information Systems Research, 24*(2), 279-294.
- Myers, M., & Newman, M. (2007). The qualitative interview in IS research: Examining the craft. *Information and Organization, 17*(1), 2-26.
- Pollock, N., & Cornford, J. (2004). ERP systems and the university as a "unique" organisation. *Information Technology & People, 17*(1), 31-52.
- Seeber, M., Lepori, B., Montauti, M., Enders, J., De Boer, H., Weyer, E., Mathisen, G. N. (2015). European universities as complete organizations? Understanding identity, hierarchy and rationality in public organizations. *Public Management Review, 17*(10), 1444-1474.
- Shoshana, Z. (1988). In the age of the smart machine: the future of work and power. *New York: Basic*.

- Sobreperez, P., Ferneley, E. H., & Wilson, F. (2005). *Tricks or trompe l'Oeil? An examination workplace resistance in an information rich managerial environment*. Paper presented at the Proceedings of the European Conference on Information Systems (ECIS) Regensburg, Germany.
- Strauss, A., & Corbin, J. (1994). Grounded theory methodology *Handbook of qualitative research* (pp. 273-285): Sage.
- Tyre, M. J., & Orlikowski, W. J. (1993). Exploiting opportunities for technological improvement in organizations. *Sloan management review*, 35(1), 13.
- Urquhart, C., & Fernandez, W. (2006). Grounded theory method: The researcher as blank slate and other myths. *ICIS 2006 proceedings*, 31.
- Urquhart, C., Lehmann, H., & Myers, M. D. (2010). Putting the 'theory' back into grounded theory: guidelines for grounded theory studies in information systems. *Information Systems Journal*, 20(4), 357-381.
- Walsham, G. (1995). Interpretive case studies in IS research: nature and method. *European Journal of Information Systems*, 4(2), 74-81.
- Walsham, G. (2006). Doing interpretive research. *European Journal of Information Systems*, 15(3), 320-330.
- Weber, R. (2003). Still desperately seeking the IT artifact. *MIS Quarterly*, 27(2), iii-xi.
- Webster, J., & Watson, R. T. (2002). Analyzing the past to prepare for the future: Writing a literature review. *MIS Quarterly*, 26(2), 13-23.
- Xue, Y., Liang, H., & Wu, L. (2011). Punishment, justice, and compliance in mandatory IT settings. *Information Systems Research*, 22(2), 400-414.