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# A Work System Theory Perspective on User Satisfaction: Using Multiple Case Studies to Propose a Work System Success Model

*Completed Research Paper*

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## **Abstract**

*In this paper we use multiple case studies and apply work system theory to them to better understand user satisfaction in each case. Based on the IS success model and the three case studies we conclude that beside the classic investigated objects information and technology as proposed by the IS success model also additional component of a work system influence user satisfaction. In particular we identified that work practices and also the relation between work practices, information and technologies have an influence on user satisfaction. We also revealed products/services and customers as potential drivers of user satisfaction and analyzed individual, environmental, strategical, and infrastructure characteristics as important contextual factors. Therefore, we suggest a work system success model for an extended understanding of user satisfaction that should better guide organizations when designing and implementing information systems.*

**Keywords:** Work system theory, IS success, user satisfaction, technology acceptance

# **A Work System Theory Perspective on User Satisfaction: Using Multiple Case Studies to Propose a Work System Success Model**

## **Introduction**

Information systems (IS), which are accepted by employees, have a higher probability of being used and thus of being successful for organizations than IS that are not accepted (Agarwal and Prasad 1999; DeLone and McLean 2003; Devaraj and Kohli 2003). Therefore explanations for individual acceptance of IS and IS success are one of the most intense researched fields in the area of IS research (Benbasat and Barki 2007; Venkatesh, Davis and Morris 2007). Although numerous studies have investigated IS acceptance (Williams, Dwivedi, Lal and Schwarz 2009) and IS success (Petter, DeLone and McLean 2012), organizational IS projects still often fail due to the lack of user satisfaction. This induces that IS projects do not generate the expected value in terms of profitability, efficiency, or organizational performance (e.g. Alter 2013; Devaraj and Kohli 2003; Hendricks, Singhal and Stratman 2007; Melville, Kraemer and Gurbaxani 2004; Nelson 2007; Sabherwal, Jeyaraj and Chowa 2006).

In the view of work system theory (WST; Alter 2013) the main reason for this is that an IS is rather defined as a technical artifact so that user satisfaction researcher treat an IS as “a technical artifact – a thing that is used” (Alter 2013, p. 73). This leads to restricted views of user satisfaction as only the technical aspects of an IS are considered (Alter 2013). For shifting away from the technic-centric focus to a more business centric focus of IS where the emphasis is not on the IS but on producing business results WST provides a framework such that IS in organizations can be analyzed and discussed through the lens of employees.

We therefore intend to extend the current state of user satisfaction research by applying WST (Alter 2006, 2008, 2013). Thus user satisfaction is according to a WST lens not only determined by the IS itself, but also by other components of a work system because participants use IS as part of a work system to produce products and services for customers. Hence, WST can be used to investigate user satisfaction in organizations as especially employees rather discuss the IS as part of a work system than just the IS itself (Alter 2013). Therefore, our research question of this paper is

*Which work system components influence user satisfaction?*

In order to provide an answer to this research questions and to further theorize on user satisfaction we rely on the IS success model (DeLone and McLean 2003), which assumes user satisfaction and the corresponding usage and net benefits equivalent to its success. We conducted three in-depth case studies in which we analyzed work systems implemented in organizations and focused especially on user satisfaction. These case studies enable us not only to analyze the perceptions of different work system components determining user satisfaction, but also to compare them with the well-known determinants of the IS success model. As we observed that user satisfaction in the three case studies is not only explained by technology, information, and service quality as proposed by the IS success model we conclude the analysis with a work system success model that explains user satisfaction not only from a technology perspective but rather from a general work system perspective.

The remainder of the paper is as follow. We will present in section two the research background about user satisfaction. We will also give a brief overview of the WST. The details about our methodology are presented in section three. Section four illustrates the results. Finally, the results will be discussed in section five deriving the work system success model and an agenda for future research.

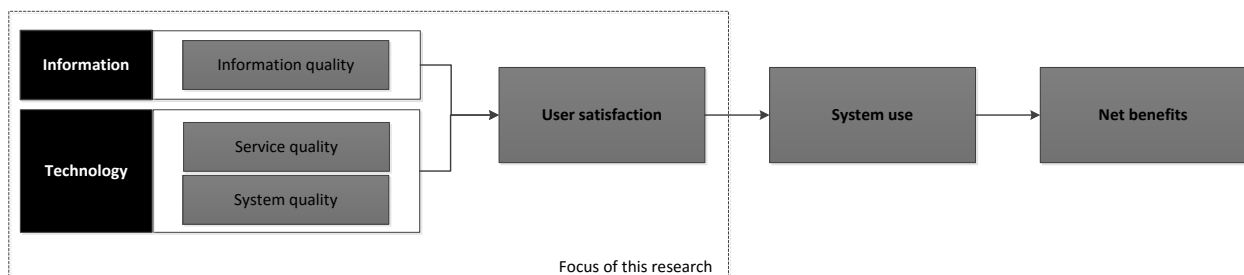
## Research background

In this section we briefly introduce the theoretical background of user satisfaction by describing the IS success model (DeLone and McLean 2003). We also give an overview of WST and describe its components.

### *IS success and user satisfaction research*

The IS success model as illustrated by Figure 1 (DeLone and McLean 1992, 2003) is intended to explain the success of an IS, which is reflected when the users of an IS are satisfied. The model assumes that the success of an IS can be evaluated in terms of information, system, and services quality, whereby these characteristics affect subsequent user satisfaction, which influences use or intention to use and the corresponding net benefits (DeLone and McLean 2003). Hence, on a more general level the model assumes that individual behavior in relation to an IS is influenced by several factors and has consequences for both the organization and the individual (see Figure 1). Therefore, the IS success model applies an object-based approach for measuring user satisfaction (Wixom and Todd 2005). This means that beliefs about an object determine user satisfaction, which in turn influences usage and net benefits. The IS success model includes the technology and the information as objects and beliefs about the characteristics of these objects as determinants of user satisfaction (Wixom and Todd 2005).

From a technology point of view, the IS success model proposes two quality dimensions. System quality constitutes the desirable characteristics of the technology itself. These measures focus on usability aspects such as ease of use, efficiency, navigation and reliability (Petter, DeLone and McLean 2008; Petter, DeLone and McLean 2012). Service quality represents the quality of the support the users receive from the IS department and IT support personnel in using the IS, such as training, a hotline, or a helpdesk (Petter, DeLone and McLean 2008; Petter, DeLone and McLean 2012). From an information point of view, the IS success model proposes one quality dimension. Information quality refers to the desirable characteristics of information as the output of an IS and includes measures focusing on the quality of the information that the system produces, such as accuracy, completeness, consistency, precision, or relevance (DeLone and McLean 2003).



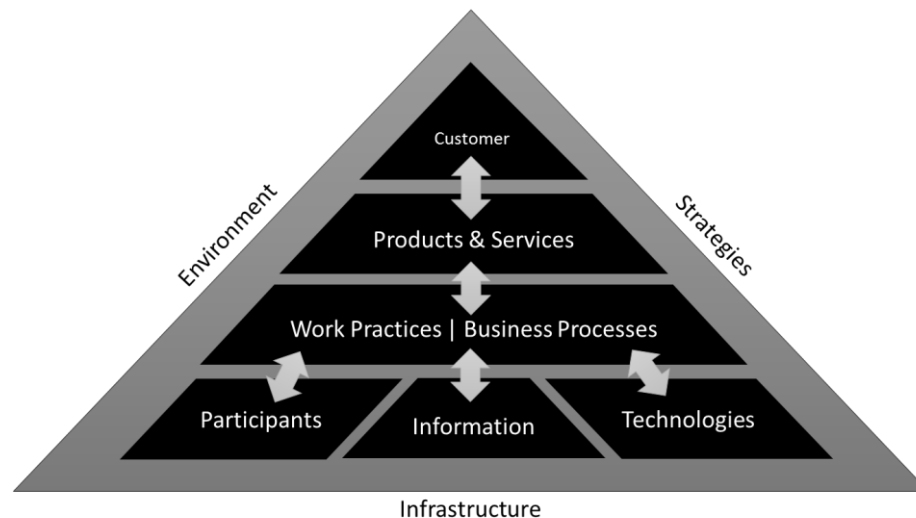
**Figure 1: IS success model (DeLone and McLean 2003)**

### *Work system theory*

With the WST the focus is not on the IS itself, but on the generation of products/services through work practices (Alter 2006, 2008, 2013). In the WST the term “system” does not describe the IS itself but a whole “work system” which is defined as “a system in which human participants and/or machines perform work (processes and activities) using information, technology, and other resources to produce specific products/services for specific internal and/or external customers” (Alter 2013, p. 75). Additionally, all components of a work system need to be aligned. The work system framework (Alter 2013, Figure 2) illustrates the work system as proposed and defined by the WST. In the following we will briefly present the particular components of a work system and discuss a linkage to user satisfaction research.

**Participants** are doing the actual work in work systems i.e. they are performing the work practices and must not be equated with IS users. Some participants may use IS, whereas others may not, although the majority of the participants are usually using IS (Alter 2006). They also need to be aligned i.e. participants

need for example the specific abilities and knowledge to perform the work practices. In relation to user satisfaction this component of a work system subsumes all factors that are based on an individual such as age, gender and personality (Agarwal and Prasad 1999; Laumer, Maier, Eckhardt and Weitzel 2015).



**Figure 2, Work system framework, based on: (Alter 2013), p. 78**

Work systems use or create **information** by storing, transferring, retrieving, updating, representing, producing and/or deleting them. Since work systems can hardly work without information it is important to classify, describe, and use them in the right way, and to examine the fitness between work practices and information (Alter 2006). In relation to user satisfaction this component of a work system subsumes all beliefs that are based on information as an object and which are usually assessed for example through information quality (Alter 2006).

**Technology** consists of tools and techniques (Alter 2006) and subsumes all factors that are related to information technology (IT). Using the definition of Thong and Yap (1995) IT can be seen as soft- and hardware which supports participants to perform their work practices. Taking this component of a work system in user satisfaction research it can be used to sum up all factors which are connected to the characteristics of the technology as an object and are usually be modelled as system or service quality (DeLone and McLean 2003).

**Work practices** represent all the activities in a work system such as “information processing, communication, decision making, coordinating, thinking and physical actions” (Alter 2006, p. 15). In the WST the term work practices is used instead of business process due to the fact that in reality not all work practices are as highly structured as a business process (Alter 2006). In the area of user satisfaction research this component of a work system can be used to combine all beliefs which bear on characteristics of work practices as an object. For example, Bala and Venkatesh (2013) examines work process characteristics to explain changes in employees’ job characteristics and job satisfaction during an IS implementation.

As a result of the work practices **products/services** are produced. Examples for products/services are physical goods, information products or services (Alter 2006). Products/services also need to fit with the demand of the customers since they represent the individuals who consume the products/services. The products/services component of a work system can be utilized to take all factors that are based on characteristics of products/services as an object and might influence user satisfaction.

**Customers** are the individuals who receive, use, or benefit directly from the produced products/services. They can be divided into internal customers inside an organization and external customers outside an organization. Usually they are also the group of people who assess the quality of the produced products/services (Alter 2006). In the field of user satisfaction this element of a work system can be used to examine all factors that are related to customers as an object relevant for user satisfaction.

Each work system is part of an **environment** that affects its operation (Alter 2013). It includes the organizational, cultural, competitive, technical and regulatory aspects. These environmental factors affect the work system and also employees' beliefs about the different components of a work system even though the work system does not rely directly on them (Alter 2006). In the field of user satisfaction these environmental factors can be subsumed as contextual factors which have been investigated for example in terms of the impact of culture on technology acceptance (Straub, Keil and Brenner 1997).

Each work system has an operational **strategy** (Alter 2006) which consists of the guiding rational and high-level choices within a work system are designed and operates. In terms of user satisfaction research this component subsumes those factors which affect the design of a work system or an IS from a strategic perspective. For example, the design of a work system can change when a financial service provider decides to switch to an online sales strategy and consequently all changes of the related work systems are attributed to this new organizational strategy.

Each work system relies on an **infrastructure** that includes human, information, and technical resources available for the performing work practices within the work system. Human infrastructure includes services like trainings, information infrastructure includes available information to be used to support work practices and the technical infrastructure includes the available computer networks, hardware, etc. (Alter 2006). In terms of user satisfaction research this component of a work system can be used to subsume those factors provided to support the usage of a new IS such a trainings, documentations, manuals, etc.

In the following we will use these components of a work system to analyze whether beliefs about these objects are important for determining and explaining user satisfaction. We will use a case study approach, which will be described in the following section.

## **Research method**

In order to develop a work system success model we conducted three in-depth case studies. In line with Yin (2009), case study research is suitable for answering the hows and whys of phenomena as it provides “a source of well grounded, rich descriptions and explanations of processes occurring in local contexts” (Kaplan and Duchon 1988; Eisenhardt and Graebner 2007). Therefore case studies are chosen to analyze the phenomenon of user satisfaction through a work system theory lens and to finally provide and discuss a work system success model. In the following we will give an overview of our overall case study research design and the different case studies conducted.

### ***Case study research***

Our case study research is conceptualized as a multi-case design such that we focused on different work systems in different organizations and used several interviews to capture different opinions and perspectives on each work system analyzed. For each case we conducted interviews. At least one researcher of our group conducted interviews, which lasted between one and three hours. In each case study a different interview technique was used which will be explained in the respective case description. For analyzing the data we systematically structured the statements provided by our interviewees according to the different components of a work system as suggested by the work system theory. With this technique we were able to identify those components of a work system as objects employees talked about when interviewed about an IS used in a specific work system. Moreover, based on the classified and encoded interviews we are able to discuss the relationship between different perceptions of the work system and the information system, and user satisfaction. The researchers revised and checked the identified categories, concerning the reliability of the research model, in a feedback loop.

We next describe the case studies, interview techniques and interviewees.

### ***The case studies***

In total we conducted three in-depth case studies which are summarized by Table 1 and further described in the following sections.

**Table 1: Overview of the three case studies**

|            | Case study A                             | Case study B                         | Case study C        |
|------------|--|--------------------------------------|---------------------|
| Technology | Financial and banking information system | Enterprise content management system | E-Recruiting system |
| Employees  | 11                                       | 24                                   | 14                  |
| Interviews | 15                                       | 34                                   | 21                  |

### Case study A: Implementation of a financial and banking information system

The company, in which we conducted case study A, is located in Germany and is a financial service provider. Within its target market the company is the market leader with total assets of more than € 2 billion and has more than € 600 million of inserts. The organization is responsible for 716 employees who work in more than 50 distinct branches. The observed project within this organization is the implementation of a new financial and banking information system, which started in 2008 and was finished in 2009. The organization introduced a new information system, replaced the legacy system, modified employees' tasks and changed the underlying processes. The legacy system was shut-down on a Friday night in 2009 and the new system was running on Monday. Everybody in the organization had to use the system on this day. The new financial and banking information system changed the work system it was used in. The financial products and services provided to external customers are the outcome of several processes and activities including consulting, information and service processes. Therefore, the work system processes and creates different types of information, including product information, process information, case-related information and core data, which includes information about customers, business partners and employees. The working system uses different technologies to facilitate offering the desired product or service, including decentralized purchased applications, email, intranet and the new financial and banking IS, whereby this IS acts as the central component in handling orders and processing information. The implementation was conducted under various environmental influences. For example, a merger led to a large number of organizational procedural changes which were not accepted by the staff at first. Moreover, a new process strategy was developed. This has changed the process landscape and established a new business relationship that has to be maintained. The actual strategy points overwhelmingly to lowering costs, increasing efficiency.

We conducted our interviews after the new system was implemented and employees had to use the system for a couple of months in their daily work already. In this case study we used the qualitative approach of narratives which are “*a series of events in a specific order – with a beginning, a middle, and an end*” (Bennett and Royle 2004). By using narratives we focused on eliciting “stories” or “plots” of how and why specific events happen such that we can explain how one event happens and how it is connect to another (Pentland 1999; Schwarz, Chin, Hirschheim and Schwarz 2014). Hence, during the interviews employees talked about their experiences when the new IS was implemented, how it changed the work systems employees participate in, how they used the system and how their perception of the work system changes and the usage of the new IS changed over time.

Altogether, we interviewed 11 individuals, for a total of 15 interviews. One interviewee was the project manager for the implementation and another one was the organizations business manager, who also served as vice project manager. We also interviewed the head of the sales and the CIO. In, three service employees performing rather back office work and four sales employees were interviewed. The age varies between 27 and 63 years.

### Case study B: Usage of an enterprise content management system

Our case study B observes phenomena occurring related to an enterprise content management (ECM) system. In general, ECM users use an ECM system to access information which is required for work routines to perform work that directly or indirectly provides a product or service to a customer (Laumer, Beimborn, Maier and Weinert 2013). The ECM system investigated by our case study is used by a financial service provider<sup>1</sup> with approximately 900 employees and total assets of EUR 3.2 billion. The

<sup>1</sup> The financial service provider of case A and B are different ones.

organization has implemented a web-based ECM system to support organizational processes and employees' working routines, providing content not covered by the banking and financial IS but required in support of sales talks and other work routines. The work system of the financial service provider of case B is similar to the one of case A. In the context of the ECM system it is important to notice that participants' supplies information through ECM system. Within the work system different types of information, including product information, process information, or case-related information, are processed and used by employees. Case related information is provided by the financial and banking IS, whereas product and process information is made accessible through the ECM system. Hence, the work system uses different, whereby the ECM system acts as the central component in providing additional information that is not covered by the banking and financial IS.

The interviews were conducted when the system was used for almost ten years. Each interview followed a two-step approach. First, we used the critical incident technique (Flanagan 1954) to capture satisfaction, beliefs and the resulting behavior of the interviewed persons. This technique suggests asking our interview partners about major positive or negative reactions and critical occurrences in relation to the work system the ECM system is used in. Based on these insights, the second part of the interview started. Here, we tried to identify how and why these occurrences occurred. Additionally, we tried to identify how the organization and employees behaved under these circumstances.

In total we interviewed 24 employees, for a total of 34 interviews. We interviewed the CEO and his two deputies. Moreover, we interviewed the head of sales, the process manager of the organization, the CIO and two managers of rather back office departments. From the back office departments we interviewed altogether six employees. We also interviewed three branch managers and seven sales employees. The age varies from 22 to 65 years. The CEO and some of the back office and sales employees were interviewed more than once.

### **Case study C: E-recruiting system implementation**

In our case study C we accompanied one of the world's leading automotive suppliers throughout the implementation of a new e-recruiting system. The organization has tens of thousands of employees at about 200 different locations globally, and generates several billion euros in revenues each year. The IS we focused on was a new e-recruiting system. The work system is designed to provide recruiting services to other organizational units which have a vacancy to fill. And the main objective of adopting the new IS was to enhance technology support for the recruiting process. The implementation of the new IS introduces new work practices that would make it possible to manage tasks faster and improve the perception of the organization in the job market. The work system is designed to integrate the recruiting activities at five different plants. Hence, from a technology point of view the new recruiting system is the core technological component of the work system, whereas additional technologies like e-mail and websites are used. From an information perspective, participants of the work system mainly process information related to either a vacancy or to an application. Participants are the recruiter, HR specialists and HR managers such that 150 HR managers all have access to the new e-recruiting system. The project began at the start of 2008, when the company intended to replace its legacy system and optimize and standardize the company-specific recruiting process.

We gathered employees' opinions about the new e-recruiting system and the changes described above before the implementation and "go-live" phases of the project in June and July 2010, ensuring a pre-implementation focus (Meissonier and Houzé 2010). In this case study made again use of the critical incident technique as described above to capture employees' beliefs and behaviors when the new e-recruiting system was implemented. This enables us to discover major positive and negative reactions when the new IS was implemented.

The interviewed employees were selected, in order to get a cross-sectional view on the acceptance of the new e-recruiting system in the organization. The interviewees work at different branches and are at different hierarchy levels (e.g. Recruiter, human resources (HR) specialist, HR manager (responsible for both the process in general and the induced changes in particular). The age of the interviewed employees varies between 26 and 53 years of age. In total, 17 employees (11.3 percent of the total change recipients) have been interviewed in 22 interviews.



## Results

In the following the results of the three case studies are presented by analyzing the satisfaction and its causes as pointed out by the employees interviewed. We will summarize the interviews by illustrated one statement for each category and by highlighting the number of similar statements observed in the interviews. Based on this analysis we describe the pattern of different work system components observed in each case that determine user satisfaction.

### Case A: Work practices as an object causing user satisfaction

The acceptance of the implementation of the new banking and financial IS can be summarized by a quotation by the organizations CIO: *“It was a question of user satisfaction. The acceptance of all the different changes of employees’ daily work requires time and a lot of change management efforts”*. In more detail the CIO explains that *“we had to realize that the user satisfaction was not only based on the new system itself. Employees complained about several components of their daily work”*. Also the business manager being in charge for the implementation pointed out that *“we realized too late that the system implementation was not only a technical change. Instead, a lot of non-technical changes were induced by the new system. We did not consider the dimension of changing work systems and the impact on employees. Therefore a lot of employees were dissatisfied”* These quote illustrate that user satisfaction is not only based on the technology or information component of a work system, but even more on other aspects. Table 2 summarizes employees’ statements and the number of occurrence of similar statements in the interviews. In this context the analysis of the interviews revealed that customers, products and services, work practices, the work practices technology fit, the technology, participants and the environment are important objects employees talked about when they expressed their satisfaction or dissatisfaction with the work system the IS is implemented in. All statements reported are related to one of the work system components and the beliefs about these components are always linked to the general acceptance of either the work system in general or the IS in particular.

Case A illustrates that user satisfaction is not only driven by technology or information aspects, but also by additional components of a work system. Moreover, case A especially illustrates that work practices and the fit of work practices with the technology but also with the products and services provided to customers are important objects when analyzing user satisfaction. In the interviews it was mentioned several times that the technology does not fit the work routines and that using the system would especially hinder employees from providing good service quality to customers. In addition, the case illustrates that environmental factors such as the general change history of the organization and its demographic structure are important contextual factors.

**Table 2: A work system perspective on user satisfaction for case A<sup>2</sup>**

|   |   |
|---|---|
| Customers<br>(N=5; 33.3%)                         | <i>“The customer is used to my good service. Because of the new system I now feel inferior as I cannot process even simple requests. I have to tell the customer that I am not able to support him as we have a new system implemented. This is embarrassing.”</i>  |
| Products / services<br>(N=6; 40.0%)               | <i>“We are used to provide a good service quality. I was afraid that with all the changes and especially with the new system I cannot provide a good service quality anymore and I resisted using the system when I interact with the customer. This is really frustrating.”</i>  |
| Work practices<br>(N=15 ; 100.0%)                 | <i>“Because there were lots of changes which induced so many challenges my colleagues and I decided to follow the old work routines. Indeed, we had a new system, but we followed the old routines as we were very unhappy with all the system because of all the efforts required to adapt to the new work practices.”</i> |
| Work practices – technology fit<br>(N=13 ; 86.7%) | <i>“I tried to apply our old work routines to the new system. But the system does not fit these old routines such that several challenges occurred which made my very dissatisfied”</i>   |

<sup>2</sup> N is the number of interviews similar statements occurred. The per cent is related to the total number of interviews.

|   |   |
|---|---|
| Work practices – information fit (N=2 ; 13.3%)  | <i>“I am rather dissatisfied. This is mainly based on the fact that when a customer calls me and asks a questions I am sometimes not able to find the requested information in the new system.”</i>   |
| Work practices – participants fit (N=3 ; 20.0%) | <i>“The new system and all work practices changes were especially challenging for our older colleagues. All knowledge of work practices were gone over night and one has to gain new experiences, which was especially challenging and dissatisfying for our older colleagues.”</i> |
| Technology (N=14 ; 93.3%)                       | <i>“The new system had a completely different logic. It took major cognitive efforts to understand the usage of the new system”</i>   |
| Information (N= 3; 20.0%)                       | <i>“The new system provides all relevant information, but it is hard to understand how to find them in the system.</i>  |
| Participants (N=10; 66.7%)                      | <i>“I was rather unhappy about the new system. In three years I can retire and I now have to learn a lot before I can retire.”</i>  |
| Environment (N=11; 73.3%)                       | <i>“We had so many changes in the past and the new system is the next one. I am really stressed by all these changes.”</i>  |
| Strategies (N=8; 53.3%)                         | <i>“I believe the new system and all the changes are just necessary as we continuously want to offer our services at lower costs.”</i>  |
| Infrastructure (N=4; 26.6%)                     | <i>“They showed us the system in the trainings, but we did not understand how the system should fit with our work practices. None mentioned that they have to change as well.”</i>  |

**Case B: Information – work practice fit as object causing user satisfaction**

User satisfaction with the ECM system can be summarized by a quotation by the CEO of the financial service provider who pointed out that *“We have a system that is over ten years old. More and more employees complain about the system. I would agree that the outdated technology needs to be replaced, but I also believe that the dissatisfaction expressed by employees is caused not only by characteristics of the technology”*. In our interviews with the financial service provider’s employees we identified as major challenges of the ECM system that the ECM system does not support the search for information when employees need to prepare sales talks. In this context the misfit of information provided and the corresponding work practices are highlighted. Employees concluded that based on an inconsistent amount of information they fear not to provide good service quality to customers and that customers can get disappointed about the service provided. This perception is mainly based on the fact that employees generally search for content on websites structured by department, but they are not always sure whether they have found all information available about a topic. Hence, searching for information is time consuming and employees have no guarantee that they have searched all potential information sources. Some of them explicitly highlight that they believe that the information provided does not match the work practices they have to perform. Moreover, as expected by the CEO employees also highlight that not only the technology induces feelings of dissatisfaction as Table 3 summarizes. In case B we can especially observe that user satisfaction is beside beliefs about the technology mainly driven by a missing fit of the information provided with the respective work practices. The missing fit also induces rather negative beliefs about the service provided to customers which also causes a rather low user satisfaction with the ECM system.

**Table 3: A work system perspective on user satisfaction for case B**

|   |   |
|---|---|
| Customers (N=17; 50.0%)                       | <i>“With the content provided it is a challenge to meet customers’ needs such that they will be dissatisfied.”</i>  |
| Products / services (N=19; 55.8%)             | <i>“I do not have all information required to provide a good service quality to our customers. I am not satisfied by the way the information is provided by the ECM system as I cannot provide a good service quality.”</i> |
| Work practices (N=9; 26.5%)                   | <i>“In general, I believe that our processes are good. We have optimized them a lot during the last years.”</i>   |
| Work practices – technology fit (N=13; 38.2%) | <i>“Our technologies support well our work practices. There is only one exception and this is the ECM system. I do not know how to use it effectively in my daily work. This is frustrating”.</i>                           |

|  |  |
|--|--|
| Work practices – information fit (N=32; 94.1%) | <i>“There is so many information provided in the ECM system, but it does not match with my work tasks. It is always difficult to understand what information is relevant for what task. This is especially based on the fact that I have to look up for information at so many different sources for just a single task, just that it is rather dissatisfying to search for the content I need for my work practices.”</i> |
| Work practices – participants fit (N=5; 14.7%) | <i>“From my perspective it is not a question of knowledge and capabilities. I believe that using an Internet-based system is not difficult and hence, we should be able to use the ECM system in our work practices”</i>   |
| Technology (N=34; 88.2%)                       | <i>“The ECM system is slow and outdated. It was implemented over ten years ago.”</i>   |
| Information (N= 31; 91.2%)                     | <i>“Our information is inconsistent. Different conditions can be found that apply to the same product and diverse media and websites provide the same type of information, which varies in terms of content.”</i>  |
| Participants (N=11; 32.6%)                     | <i>“It is simply a question of personality. If you simply do not want to use the system you will also not find any information”</i>  |
| Environment (N=12; 35.3%)                      | <i>“A lot of new regulatory requirements were set up during the last years. All this information needs to be published in the ECM system, which does not make the usage of the system easier. It is rather more frustrating as one have to find all these regulatory aspects such that our work is in line with them.”</i>   |
| Strategies (N=8; 23.5%)                        | <i>“Our strategy is to provide a high service quality to customers. In my point of view the ECM system prevents us from realizing this strategic objective.”</i>   |
| Infrastructure (N=5; 14.7%)                    | <i>“There is no support for using the system at the moment. Maybe this is the case because the system has been implemented over ten years ago”</i>   |

**Case C: Work practices and their fits causing user satisfaction**

Regarding user satisfaction at case C we can conclude that beside the well-known technology and information characteristics, especially work practices and their fit with the technology and the information are additional important objects of a work system determining user acceptance. In this case one recruiter pointed out that *„both aspects are important and could not be treated independently. The grooviest IT will not provide any benefit if the process does not fit the requirements.”* In this context we could especially observe that new characteristics of the work processes like new roles for employees (*“if they change my role I won’t comply with the project.”*) or new additional work practices (*“we published our vacancies the last 20 years without a CC [Corporate Centre] looking over it, honestly, I don’t know what for”*) determine user satisfaction. Moreover, the fit of work practices with the technology or the information were mentioned as objects determining satisfaction. Also in terms of contextual factors individual differences and user personality were highlighted by the interviewees. Moreover, as the case was conducted in a pre-implementation phase the respective change management interventions were mentioned as important environmental factors influencing the user satisfaction.

**Table 4: A work system perspective on user satisfaction for case C**

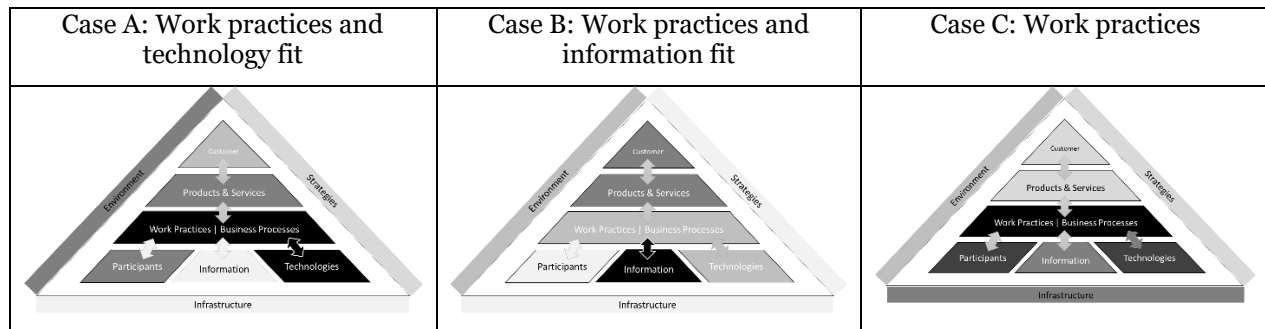
|   |  |
|---|--|
| Customers (N=9; 42.8%)                        | <i>“With the new system I have to tell business managers that applications are now accessible online only. They always want them printed and take our service quality into question. This is a little bit frustrating for a service department like ours.”</i> |
| Products / services (N=8; 38.1%)              | <i>“I believe that our service to candidates has improved. They can check the status of their application online. I like that this might reduce the number of applicants calling and asking for a status update.”</i>  |
| Work practices (N=19; 90.5%)                  | <i>“To say that I’m more satisfied regarding the recruiting process (...) than in the past with the old process and the old system; however, a few things remain to be clarified and have to be done.”</i>   |
| Work practices – technology fit (N=15; 71.4%) | <i>“The selection process (...) focuses strongly on grades at the moment. (...). This misfit with our process is mainly based on the system which induces this structure”</i>  |
| Work practices –                              | <i>“The editing, classification and correspondence with this category of applicants</i>  |

|  |  |
|--|--|
| information fit (N=8; 38.1%)                   | <i>must be processed outside the system, just born out of necessity. As I said, we take the liberty to deliberately avoid the system."</i>   |
| Work practices – participants fit (N=4; 19.0%) | <i>"We need to focus on our employees. We need to ensure that they have the necessary capabilities to work with the new work practices."</i>   |
| Technology (N=17; 80.9%)                       | <i>"Long reaction times, I really mean the system, these response times, (...) until the windows open, (...) until I can open any applications, (...) all these attachments, until they open up, this is really extreme long. You make the clicks and then the hourglass is rotating and rotating and this is the moment, where you think 'this could be a little bit faster now'".</i>                                |
| Information (N= 11; 52.3%)                     | <i>"We have at least five assignments [to jobs per applicant], all assignments are followed by the same test, the same dialog partners. This constellation stands in contrast to the logic of the new system, which is based on applications and not on candidates. Multiple applications per candidate have to be handled separately, even if parts of the process, e.g. the selection procedure, are identical."</i> |
| Participants (N=13; 61.9%)                     | <i>"In general, it is a personal problem, if someone prefers working with information systems or with a paper-based process".</i>  |
| Environment (N=9; 42.8%)                       | <i>"The managers give positive feedback, this is important for us. You can really notice that they engage oneself in the system and work with us as well, and that is good for me."</i>  |
| Strategies (N=7; 33.3%)                        | <i>"We wanted to improve our employer image at the job market. I believe that was the reason management decided to implement the system."</i>  |
| Infrastructure (N=15; 71.4%)                   | <i>"Good trainings for using the system were provided."</i>  |

## Discussion and implications

IS projects still often fail due to the lack of user satisfaction which results in a lower usage (Alter 2013; Nelson 2007). One explanation for this might be that IS is rather treated as “a thing that is used” than as part of a work system (Alter 2013). We therefore applied a WST perspective on user satisfaction and the results of the three case studies enable a clearer understanding of user satisfaction and the different objects causing it. The results as summarized by Table 5 provide an extended perspective on user satisfaction by illustrating that user satisfaction is based beside beliefs of technology and information characteristics also on beliefs about work practice, work practice and technology fit, work practice and information fit, product and service, and customer characteristics. Furthermore, the results indicate that environmental, strategical and infrastructure characteristics are important contextual factors determining user satisfaction. These results provide the base for the work system success model, which will be proposed in following.

**Table 5: Summary of case studies**



(The darker the more important the work system component has been evaluated in each case)

### Work system success model

Based on the IS success model the work system success model assumes that beliefs about the technology and information characteristics are important determinants of user satisfaction. These components of a work system have been well researched in the past and several characteristics have been identified that determine user satisfaction. This is also confirmed by our case studies as employees highlight that beliefs about the technology and information determine their user satisfaction. Hence, we rely on these well-known relationships and discuss an extension of the IS success model in the following based on the application of work system theory when analyzing our case studies and by explicitly stating propositions for each additional work system component. The proposed work system success model is illustrated by **Fehler! Verweisquelle konnte nicht gefunden werden..**

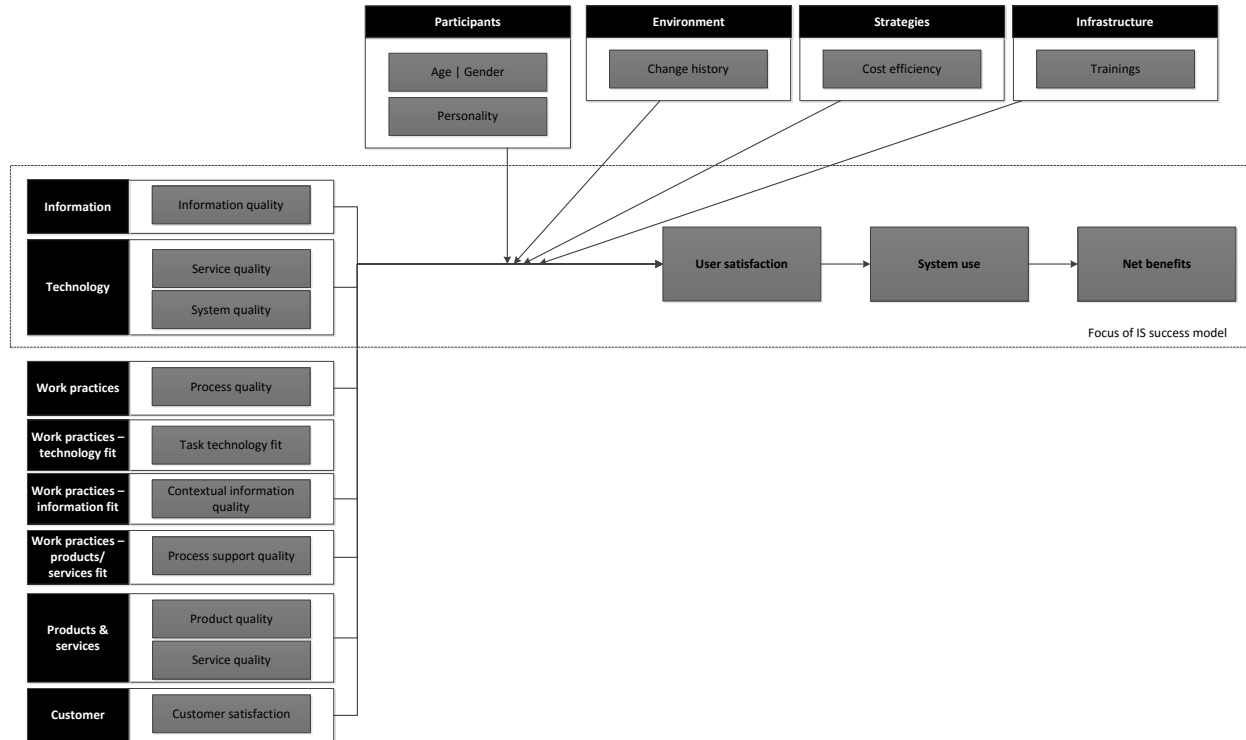


Figure 3: Work system success model

### Work practices

The first proposition concluded from our case study research is related to the work practices being part of work system. In all three case studies employees indicate beliefs of work practices such as the process quality (“I believe that our processes are good”) and that these beliefs that influence user satisfaction (e.g. “To say that I’m more satisfied regarding the recruiting process”). Especially in case A and C the importance of work practices for user satisfaction could be observed. Hence, user satisfaction is influenced by beliefs of work practice characteristics. Hence we can conclude that:

**Proposition 1: The better the perceived work practice characteristics the higher is the user satisfaction.**

### Products, services and customers

Besides the core components information, technology and work practices the elements products/services and customers have been identified by our case study research to be important for explaining user acceptance. Products/services are assessed in terms of their quality which should provide a certain degree of customer satisfaction (Alter 2006, 2013). Participants have the goal to reach a preferably high degree of customer satisfaction (“The customer is used to my good service.”). If IS prevents participants from

reaching this goal (“*Because of the new system I now feel inferior as I cannot process even simple requests.*”) then user satisfaction is lower (“*This is embarrassing.*”). In turn if the use of IS leads to the production of products/services with a higher quality which may result in a higher customer satisfaction then user satisfaction may increase. On the basis of both the WST (Alter 2013) which states that there is a direct connection between product quality and customer satisfaction and the importance of product or services characteristics as highlighted by our case studies we suggest that:

***Proposition 2a: The better the product/service the higher is the user satisfaction.***

***Proposition 2b: The better the product/service quality which results in higher customer satisfaction the higher is the user satisfaction.***

### **Fit of work system components**

Moreover, the alignment or fit between the different components participants, information, IT and work practices has been rather neglected in current research, although these are very important aspects of user satisfaction as highlighted by the three case studies conducted.

For example, information is useless when it does not fit with the work practices (Alter 2013). Therefore information always needs to be evaluated in context with the associated work practices (Dishaw and Strong 1999; Goodhue 1995). Otherwise apparently high quality information which was produced by IS but does not fit with the work practices might result in a lower user satisfaction. High quality IS might produce apparently high quality information, but the acceptance of the IS will suffer if the produced information does not fit with the work practices. Especially in case B it can be demonstrated that it is not the IS but the information in relation to the work practices (“*It is always difficult to understand what information is relevant for what task.*”), which has a negative influence on user satisfaction. Based both on the WST (Alter 2013) which highlights the importance of a fit between information and work practices and the results of our case studies indicating the importance of this work system component we propose:

***Proposition 3: The higher the perceived fit between information and work practices the higher is the user satisfaction.***

Similar to information also IS need to be aligned with work practices (Goodhue and Thompson 1995). One can say that IS which are cheap and easy to use might be considered as high quality IS. Especially case C illustrates that if work practices require IS which needs to be reliable and fast, then the IS does not fit with the work practices and then also user satisfaction might suffer although the actual IS quality is very high (“*This misfit with our process is mainly based on the system which induces this structure*”). Using both the WST (Alter 2013) as a basis which states that IS in organizations is useless as long as it does not fit with the corresponding work practices and along with three case studies which support this assumption we suggest:

***Proposition 4: The higher the perceived fit between IT and work practices the higher is the user satisfaction.***

***Proposition 5: The higher the perceived fit between work practices and the products/services produced the higher is the user satisfaction.***

### **Participants**

Research has already been demonstrated the link between individual differences of work system participants and user satisfaction. However, past research did not include different types of work practices and put them in relation to participants and IT. But only examining individual differences in relation to IT without considering different types of work practices might not cover the full range of business situations. Participants might be able to use the IT itself, but they might not be able to perform the work practices where they actually have to use the IT. For example, in case A it was highlighted that “*all knowledge of work practices were gone over night and one has to gain new experiences, which was especially challenging and dissatisfying for our older colleagues.*” Here, the driver of IT acceptance is not the IT itself but the work practices, whereas the importance of this factor depends on participants age. Hence, the importance of work practice characteristics as determinant for user satisfaction is especially highlighted for older employees. Therefore, based both on the WST (Alter 2013) which highlights the

importance of individual characteristics and the results of our case studies that beside the effect of age on the impact of work practice on user satisfaction also highlights similar effects for the interplay of participant characteristics and work system components (e.g. in case B the influence of personality was highlighted) we generally suggest:

***Proposition 6: The characteristics of participants (e.g. age and gender) are important contextual factors which determine the strength of effect of the characteristic of each work system object on user satisfaction.***

### **Contextual factors**

WST proposes as contextual factor each work system operates in environmental, strategical, and infrastructure characteristics. In our case study analysis we also observe that these characteristics are also mentioned by participants of a work system in relation to user satisfaction. For example, in case B regulatory aspects were mentioned that highlight the importance of the information and information work practice fit characteristics (*"It is rather more frustrating as one have to find all these regulatory aspects such that our work is in line with them."*). Hence, based on the environmental characteristics some work system objects might be more influencing user satisfaction than others. Also for strategical characteristics it could be observed in case A that the system was implemented due to some strategic reasons to lower costs such that technology characteristics were more influencing user satisfaction than other work system objects. In addition, case C highlights that infrastructure characteristics are important as especially the support provided to use the system enabled the positive impact of technology characteristics on user satisfaction. Based on these case results which are highlighted exemplarily for similar phenomena observed in the case studies and based on WST which highlights the importance of these contextual factors, we assume generally

***Proposition 7: The environmental characteristics are important contextual factors which determine the strength of effect of the characteristic of each work system object on user satisfaction.***

***Proposition 8: The strategical characteristics are important contextual factors which determine the strength of effect of the characteristic of each work system object on user satisfaction.***

***Proposition 9: The infrastructure characteristics are important contextual factors which determine the strength of effect of the characteristic of each work system object on user satisfaction.***

### **Theoretical implications**

The results extend user satisfaction research (e.g. DeLone and McLean 2003) by further theorizing that the beliefs of participants of a work system an IS is used in is based on different objects. The IS success model (DeLone and McLean 2003) and several additional research approaches relying on this model (Petter, DeLone and McLean 2012) reveal the technology and information as important objects determining user satisfaction. The proposed work system success model illustrates that beside these well-research objects additional ones exist that also explain user satisfaction, which would have been neglected if only the IS success model would have been applied to explain these cases. Hence, we extend prior research by extending the IS success model by adding to the technic centered focus a business centered one. Therefore, based on three case studies we derived the work system success model as an extension which includes based on work system theory nine additional propositions related to the different components of a work system. We especially highlight the importance of work practices, products and services, customers, the fit of work practices with product and services, technologies and information as well as participants, the environment, strategies and infrastructures as contextual factors.

Therefore, our proposed model is a first step toward integrating work system theory with technology acceptance research. Therefore, this research is in line with the call of Orlikowski and Barley (2001), who state that IS research must *"make much more use of more recent developments in organization theory"* (Orlikowski and Barley 2001, p. 153). Using work system theory makes it possible to distinguish between these components as described in this paper and to provide a work system success model that explains

beside a technology focus user satisfaction also from a more business orientated one, which might especially guide organization to better ensure user satisfaction when implementing and using IS.

### ***Practical implications***

The proposed work system success model can guide organizations as they (re)design work system to focus on the characteristics that influence user satisfaction the most. By differentiating between the different work system components and their influence on user satisfaction, we can conclude that the influence can be different regarding the respective context the work system is designed and operates in. For organizations this implies that efforts must be made to ensure to identify first of all the important components determining user satisfaction. In this context the work system success model summarizes different components that are relevant and the described interview methods can be used in organizations to discuss with employees the positive and negative aspects related to a work system. The results might have an impact on designing change management activities to focus on the relevant work system components or on the design of new or changing work system in order to identify the challenging components that need to be changed. For example, in case C training activities during the implementation phase should target work practices which are evaluated critically by the participants of the respective work system and in case B a new ECM strategy should focus on the fit of information with work practices as one of the major negative occurrences reported by employees. With a sole IS success focus these aspects could not have been revealed such that the work system success model provides an extended base for organizations to design IS and the corresponding change management strategies when implementing them.

In summary, the implication from this study is that it is unlikely that “one size fits all”. There are various components of a work system beside the technology and information that determine user satisfaction and the importance of these factors depends on the context. Hence, if management is knowledgeable about and aware of these various objects, they can design better work systems and change management strategies.

### ***Limitations***

Although, we derived several implications for research and practice, our results might be limited by some facts which we will explain in the following. First of all, we are limited as we can only conclude our proposition based on three case studies which might represent single cases and which cannot be generalized to other organization in different cultural settings. This limitation has also an influence on the particular aspects we discussed as more and different characteristics of the components of a work system might be found in different cases. Moreover, employees in different organizations might highlight other aspects being more important for determining their satisfaction of a work system and the IS used in this work system. However, we believe that the core arguments of this article, that is a WST lens might be useful to explain user acceptance in a better way is not affected by the limitations. Second, in our paper we were using the term acceptance in relation to user satisfaction without differentiating between different or additional forms of acceptance. Acceptance might refer to the initial adoption decision before using a technology or the post-adoptive behavior also known as continued use (Bhattacharjee and Lin 2014). We did decided on user satisfaction as one specific form of acceptance, such that particular views and determinants of technology acceptance expressed in different variables might be missing and the effects concluded from the case study might be different for different forms of user acceptance. Therefore, additional research on theorizing and validating these effects is necessary when doing research on WST in relation to technology acceptance.

### ***Future Research***

Based on our case study research and the discussion in this section we conclude that further research is needed to better explain user acceptance, although prior research has done a good job to explain this phenomenon from a techno-centric point of view. Further research should focus on the one hand more on the fit dimensions between different components of a work system e.g. between IT and work practices to better understand how far these connections and fits do have an influence on technology acceptance. On the other hand it should also focus on researching the two components products/services and customers



because they might also have an influence on user acceptance, but have not been researched yet in relation to technology acceptance. The case studies conducted and the proposed work system success model is a first step in such a research agenda. We revealed that there are still some gaps in technology acceptance literature when using the WST lens and analyzing our case studies through this lens. Therefore, we suggest using the proposed work system success model in further research to fill these gaps. The proposed model can then be further evaluated using additional case studies or empirical studies of IS used as part of a work system in organizations.

## **Conclusion**

We discovered by applying WST to three case studies that beside the classic investigated objects information and technology of the IS success model also additional component of a work system influence user satisfaction. We revealed that work practices and also the relation between work practices, information and IS have an influence on user satisfaction. We also identified products/services and customers as potential drivers of user satisfaction and revealed individual, environmental, strategic, and infrastructure characteristics as important contextual factors. Therefore, we suggest a work system success model to better understand user satisfaction to better guide organizations when designing and implementing IS.

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