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# Towards the User: Extending the Job Characteristics Model to Measure Job Satisfaction for ERP Based Workplaces – A Qualitative Approach

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## Abstract

Over the past years the widely spread use of enterprise resource planning (ERP) systems has significantly changed the way of working. The close correlation between task fulfillment and ERP use has an essential effect on the software users and their job satisfaction.

To understand job satisfaction is an important success factor for all firms because it impacts the behavior of the employees. The job characteristics model (JCM) derived by Hackman and Oldham explains job satisfaction by looking at the characteristics of the tasks. Because of the significant impact of technologies, such as ERP systems, we argue that the model has to be extended towards a user-centered view and found technology characteristics explaining job satisfaction, too. We use a qualitative approach to define these unknown constructs and derived an extended model which has to be tested and verified by further research.

## Keywords

Job Satisfaction, ERP, Job Characteristics Model, user centered research, qualitative case study

## 1. Introduction

Information technology (IT) plays a significant role in the design of workplaces and the performance of the employees (Vilpola, 2008). Understanding and designing the interaction of users with the technology impact work-related outcomes, such as job satisfaction. It is critical for firms to understand the influence of IT on the quality of user`s work life (Joshi and Rai, 2000). Especially ERP systems can result in radical organizational changes affecting the individual jobs (Morris and Venkatesh, 2010). ERP Software is defined as an integrated business information system to manage different business processes (Singh and Wesson, 2009). ERP use affects by its nature the job routines of the user (Murphy et al., 2012). These systems play a significant role for all kinds of organizations and can be illustrated as "the backbone of the information systems in most large and medium companies, but also in many administrations" (Grabot et al., 2008). Therefore, it is very important to study workplaces which are using commercial ERP software packages. ERP systems support diverse business processes (Kurbel, 2013) while contributing to a more efficient design of processes as well as to a decline of the total costs (Fui-Hoon Nah et al., 2001). ERP use cannot only focus on technical and organizational aspects, but must take the users' ambition and perceptions into account (Grabot et al., 2008). That means, there exits an interaction between the task, ERP use and the users ambition. The design approach of most ERP systems is still technology based although there is

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evidence that a human-centered design positively influences the user satisfaction (Usmanij et al., 2013).

Because of the influence of ERP systems on the individual work routine, we assume that the use of ERP systems affects the job satisfaction of the involved employees. Research in this area is still rather rare (Morris and Venkatesh, 2010). Understanding the causes of job satisfaction is a key to success for all firms because it can positively influence the individual engagement for the organization and it can negatively influence the intention to leave a company (Singh et al., 1996). Furthermore, there is empirical evidence that job satisfaction has indirect influence on turning this intention to action (Thatcher et al., 2002).

There are many approaches for the explanation of job satisfaction in general. One of the most popular approaches is the job characteristics model (JCM) by Hackman and Oldham (1974). This model is still very common and is used for the design of workplaces. Furthermore, the model has been empirically tested multiple times and was applied for studying research questions regarding ERP system implementations (e.g. (Grant and Uruthirapathy, 2003), (Morris and Venkatesh, 2010) and (Murphy et al., 2012)). Morris and Venkatesh (2010) argue for the validity of the model for ERP based workplaces. Though, none of these studies named possible variables associated with the technology that influence the job satisfaction. So, we based our investigation on the JCM and further tried to find out which other variables are important to explain our research subject. The characteristics are used as a basis to explain the resulting job satisfaction for the workplaces investigated. Because of the significant changes that new technology brings to the design of workplaces we argue that it may not be enough to consider only task characteristics for the explanation of the job satisfaction. Therefore, the basic model of the JCM needs an extension for jobs using an ERP system.

These considerations lead us to the following research question: *Do other variables besides the task characteristics of the JCM need to be considered for ERP based workplaces to explain job satisfaction? What are these variables?* The goal of our study is to apply the model for ERP based workplaces, to test the JCM for the case study we investigated and to expand the constructs by further causes if necessary. To explore these unknown variables, we use a qualitative research method. We did not just take given constructs and tested them in a quantitative way, but we asked the users of a system about their needs. We investigated employees of a SME in Germany who work with a SAP ERP system that was implemented three years ago. As far as we know the existing extensions of the JCM are dealing with a discussion about the number of job characteristics needed to explain job satisfaction as well as finding other moderating variables and test the psychological states introduced by Hackman and Oldham (e.g. (Evans et al., 1979), (O´brien, 1982)). This is the first research approach expanding the model by taking into account the influence of an IT system.

In the following section, we firstly present the JCM as a basis of our investigation before we give an overview of the state of the art for the research on the influence of IT on job satisfaction. Next, we describe the research design. Based on our findings, which were gained from interviews of a case study, we draw conclusions on modelling job satisfaction. We conclude with an outlook on further research.

## 2. Theoretical Foundation

### 2.1 Job Characteristics Model
As a basis for explaining the job satisfaction in the case of working with an ERP system we use

a general model of the research field to explain this satisfaction. The job characteristics model (see Figure 1) was developed by Hackman and Oldham (1974) to describe the formation of motivation and satisfaction by designing a workplace. They used questionnaires in different industries and with people following different careers, so that a generic model was set up which can be used for various cases. The model describes the impact of five core dimensions on three critical psychological states which influence the job outcomes internal work motivation, quality of work performance as well as satisfaction with the work positively and absenteeism as well as turnover negatively. For our research we take a closer look on the job satisfaction as one of the work outcomes. The psychological states are experienced meaningfulness of work, experienced responsibility for outcomes of the work and knowledge of the actual results of the work activities. Hackman and Oldham (1974) concluded that each of the three psychological states follow some specific job characteristics.

The job characteristics are skill variety, task identity, task significance, autonomy and feedback. These characteristics describe how a workplace is designed and can be used to improve the job outcomes if this is needed. Hackman and Oldham (1976) also introduce a moderating variable in their model which is called employee growth need strength. The higher the value of the need is, the more intensively the people, who experience an objective incline of the described characteristics, will also experience the psychological states (Hackman and Oldham, 1976). The theory has been empirically verified. An often cited work is a meta-analysis from Fried and Ferris (Fried and Ferris, 1987) who confirm the impact of the job characteristics on the work outcomes.
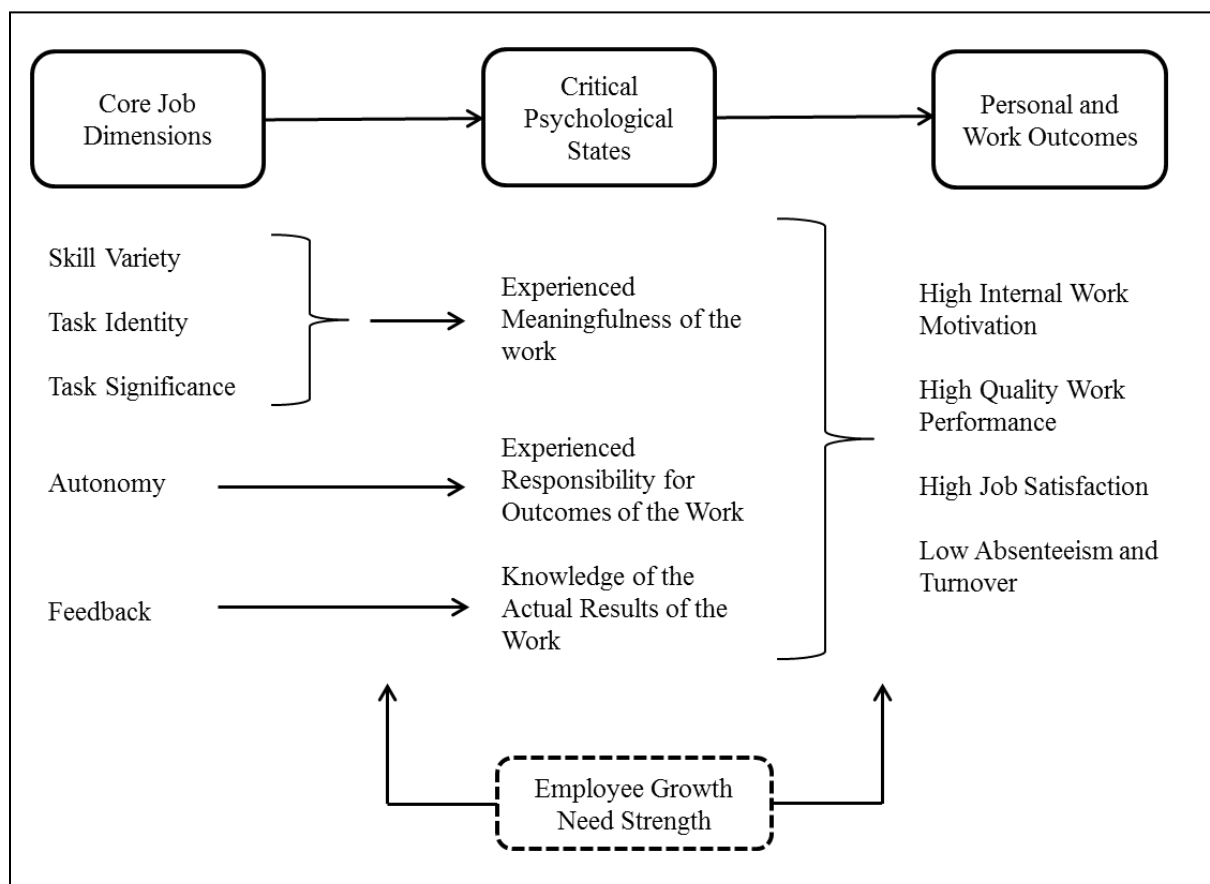


**Figure 1**: Job Characteristics Model by Hackman and Oldham (1976)

## 2.2 Job Satisfaction and ERP Use

Different studies can be found which prove the impact of an ERP system on job satisfaction. A study of Joshi and Ray (2000) found that the quality of information systems in general determines the satisfaction of the involved employees. They concentrate on the satisfaction with the system which describes another research focus compared to satisfaction in general. Furthermore, the conclusion is that the results concerning the influence are mixed and the extent of the influence of IT on job satisfaction is very complex. A relationship between the use of IT and the perceived job characteristics as well as job outcomes was shown by Barker and Wright (1997). They used the JCM as a theoretical basis and found a significant influence of the end user computing on three of five characteristics, namely the skill variety, task significance and feedback. Bala and Venkatesh (Bala and Venkatesh, 2013) developed a latent growth model to explain job satisfaction changes after an enterprise wide system implementation while using other job characteristics as a basis for their investigation. They found that perceived technology characteristics influence perceived process characteristics. These in turn can lead to changes in the two other job characteristics, named job demands and job control which in the end explain job satisfaction. Another approach was done by Morris and Venkatesh (2010) who also used the JCM as a basis to explore whether the cause-and-effect relationships between the given characteristics and job satisfaction are moderated by an ERP system implementation. A moderating effect of the ERP introduction between skill variety, autonomy and feedback with job satisfaction was found. Morris and Venkatesh (2010) used a questionnaire before and after the implementation, so they could use the implementation as a dummy variable and test the differences of the given relationships from the basic model. They further confirm the validity of the influence of all five job characteristics on job satisfaction, independently from the implementation process. So, we assume that the JCM is well suitable as a basis for our investigation. Results from Morris and Venkatesh (2010) revealed that their model could explain 47% of variance, which leaves approximately half of the variance unexplained. So, we want to look for additional variables explaining the job satisfaction with a qualitative research method which is explained in the next section. Murphy et al. (2012) used interviews for collecting data about the perceived changes of job characteristics after an ERP implementation, too. They found that the extent to which users experience these changes is depending on other aspects like formal authority and nature of their work role.

Most of the studies (e.g. (Bala and Venkatesh, 2013); (Morris and Venkatesh, 2010); (Murphy et al., 2012)) take a look at the changes resulting from the implementation process while we try to focus on jobs routinely working with an ERP system. All the research mentioned followed quantitative research approaches. They were used to test existing variables of the system. An extension of the initial model that takes a closer look at the real needs of employees working with ERP systems was so far not intended.

## 3. Case Study Design

Since theory provides a good guide to data collection and one of the ways in which data can be analyzed (Walsham, 2006), we consulted the Job Characteristics Model (Hackman and Oldham, 1974) described above and used it as a framework for and a starting point of our empirical research. Owing to the weak empirical basis in the field, we selected an explorative research method. This allowed us to deduce new categories that the underlying model does not cover. Case study research is suitable for examining fields without comprehensive empirical material (Dubé and Paré, 2003) and to understand the dynamics between organizations, technologies and people within single settings (Eisenhardt, 1989). The case research strategy is especially suited to study IS in a natural setting by capturing the knowledge of practitioners and developing theories from it (Benbasat et al., 1987). According to Yin (Yin, 2009) we consider our research

design as "an action plan for getting from here [initial set of questions] to there [set of answers]". Our case is a medium-sized company of the mechanical engineering industry. An SAP system was introduced three years before the interviews were conducted while replacing an old ERP system. By the time of our interviews 15 of the company's 50 employees work with this system.

To achieve richness and flexibility in the research process (Dubé and Paré, 2003) we decided to collect data via semi-structured interviews. Prior to conducting the interviews, we developed a guideline to support the conversation with the interviewees (Bryman and Bell, 2007) as well as the data analysis. The interview guide was divided into three parts containing different questions 1. about the job situation in general and experiences with the ERP system, 2. concerning changes at the workplace caused by the system as well as the relation between the ERP system and the job satisfaction and 3. about causes of job satisfaction in general. This approach allowed for comparing the results, while simultaneously leaving sufficient room for comprehensive statements and additional questions.

We collected the data in seven interviews in a period of one month. The interviewees work in different departments, bear different responsibilities and have different experiences with ERP systems (see Table 1) which allows us to gain valuable insights from different perspectives. During the interviews, we adopted the role of neutral observers (Walsham, 2006) in order to obtain answers that were as frank as possible. The interviews were transcribed and encoded. Given the exploratory nature of our research, we employed the qualitative content analysis method (Vogelsang et al., 2013). The generated transcripts served as the analysis unit of the research. According to the approach of formal structuring (Mayring, 2000) relevant statements were extracted and encoded to core-statements. To support the coding procedure, we defined coding rules. Relating to the content analysis we introduced a rule to evaluate the categories as relevant or irrelevant. The material was screened a number of times and all formed categories were revised. Eventually, the categories were gathered and reduced to main categories. Statements with no possible assignment to given categories were converted to new categories. The process ended when all statements could be clearly assigned to one category. This approach supports the deductive reasoning by examining the categories as proposed by the JCM. At the same time it allows for gaining inductive arguments for building new categories that have not been covered by the model. By involving a team of researchers and encoders in the data collection and analysis, we provide intersubjectivity. Furthermore, we want to provide reproducibility and thus meet reliability demands through the team-based research as well as the elucidation of the data collection and analysis processes.

We received new categories by letting the interviewees speak freely. Additionally, we tested the constructs from the JCM in a written form after the interviews were finished. Doing so, we explored the degree of the characteristics in general as well as for changes perceived by the ERP system. We used items from the job diagnostic survey, an instrument designed to test the JCM (Hackman and Oldham, 1974). To test the importance of the constructs for the consulted employees we used a 7-point likert scale. The possible answers on our questionnaire were valued by "I strongly disagree"=1, "I disagree"=2, "I partly disagree"=3, "I neither agree nor disagree"=4, "I partly agree"=5, "I agree"=6 and "I strongly agree"=7. After receiving all answers, we calculated a mean and a median for the JCM constructs, so that we could examine the importance of the constructs for our case study.

| Interview number | Position | Experience with ERP systems |
|---|---|---|
| 1 | User, procurement | Long-term experience; also with preceding system |
| 2 | User, engineering draftsman | No prior experience |
| 3 | User, sales | Long-term experience; mostly with other ERP systems in different firms |
| 4 | User, production | No prior experience |
| 5 | User, construction | Medium experience with ERP systems in other firms |
| 6 | IT manager, project manager during implementation | Medium experience with other ERP systems; currently intensive work with SAP system |
| 7 | User, procurement | Low experience with preceding system |

**Table 1**: Overview interviewees

## 4. Results

We derived data from seven interviews from which six were performed personally and one was done via telephone. We could identify 127 statements regarding job satisfaction which complies with 18.1 statements in average per interview.

Surprisingly, the categories of the JCM are the categories mentioned the least during the interviews. In total the five job characteristics could be identified 19 times while autonomy was named the most. Autonomy describes feelings of personal responsibility and can be defined by freedom in scheduling the work and planning the performance of it (Hackman and Oldham, 1976). So, the variable is dependent on the degree people have to work together without the freedom of designing their own tasks. ERP systems can positively influence the feeling of responsibility because the user can receive information out of the system without asking colleagues. The other job characteristics are mentioned less than five times which means that they do not seem to be very important to the interviewees. During the conversation situation they seem to fall behind other categories which are perceived as more important for the job satisfaction of the employees.

Nevertheless, all JCM categories were mentioned. Moreover, the results, obtained by evaluating the categories of the JCM, show a different picture. All categories are mostly high rated by the interviewees. The median and mean values are presented in Table 2. Regarding the five job characteristics, task significance and skill variety reach the highest results with a median in the answer category "I agree" and a mean in the answer category "I partly agree", followed by autonomy and feedback. Also the least experienced variable task identity still lies in the range of "I neither agree nor disagree". The growth need strength and the job satisfaction were also high-rated by the interviewees. Due to the small sample of our qualitative approach we did not aspire deeper statistical analysis. So, we are not able to confirm statistical relationships of the constructs of the JCM within this study. Nevertheless, in accordance with the results of Morris and Venkatesh (2010) who confirmed the validity of the model for ERP based workplaces we assume the JCM as an appropriate approach to explain job satisfaction for these workplaces.

Moreover, we defined four further constructs as causes of job satisfaction which are all closely related to the tool of the employee`s work, the ERP system. 108 statements could be allocated to the technology. The results show the importance of integrating technological aspects for the

explanation of the job satisfaction for people whose work is affected by ERP systems every day. The categories deduced from the statements are: usability, service quality, perceived usefulness and data quality.

| JCM construct | Median | Mean |
|---|---|---|
| Task Significance | 6 | 5 |
| Skill Variety | 6 | 5 |
| Autonomy | 5 | 5,33 |
| Feedback | 5 | 4,78 |
| Task Identity | 4 | 4,22 |
| Growth Need Strength | 7 | 6,5 |
| Job Satisfaction | 6 | 5,67 |

**Table 2**: Test results of JCM constructs

Table 3 gives an overview of all derived categories with definitions, an allocation which describes where the category was defined first and the number of statements allocated to these categories.

| Category | Allocation | Definition | No. |
|---|---|---|---|
| Usability | *indefinite* | "Extent to which a system, product or service can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use." (Deutsches Institut für Normung E.V., 2006) | 45 |
| Service Quality | Success Model | Overall support for the employees regarding the technology used. It is especially important during the implementation but also covers the time of usage. (Delone and McLean, 2003) | 27 |
| Perceived Usefulness | TAM | "The degree to which an individual believes that using a particular system would enhance his or her job performance." (Davis, 1986) | 23 |
| Data Quality | Success Model | Extent to which the data provided is regarded as true, reliable and sufficiently up to date. (Pipino et al., 2002) | 13 |
| Autonomy | JCM | "The degree to which the job provides substantial freedom, independence and discretion to the individual in scheduling the work and in determining the procedures to be used in carrying it out." (Hackman and Oldham, 1976) | 8 |
| Task Identity | JCM | "The degree to which the job requires completion of a 'whole' and identifiable piece of work; that is, doing a job from beginning to end with a visible outcome." (Hackman and Oldham, 1976) | 4 |
| Skill Variety | JCM | "The degree to which a job requires a variety of different activities in carrying out the work, which involve the use of a number of different skills and talents of the person." (Hackman and Oldham, 1976) | 3 |

| Feedback | JCM | "The degree to which carrying out the work activities required by the job results in the individual obtaining direct and clear information about the effectiveness of his or her performance." (Hackman and Oldham, 1976) And the feedback given by others. | 2 |
|---|---|---|---|
| Task Significance | JCM | "The degree to which the job has a substantial impact on the lives or work of other people, whether in the immediate organization or in the external environment." (Hackman and Oldham, 1976) | 2 |
| **Total** | | | **127** |

**Table 3**: Categories

The construct perceived usefulness is well known in IS research and is defined by the technology acceptance model of Davis (Davis, 1986). It was mentioned 20 times during our interviews. For this category it should be emphasized that it describes feelings and perceptions of the person towards the ERP system. Perceived usefulness is closely linked to user satisfaction (Adam Mahmood et al., 2000). In contrast, the construct of usability describes the users' feelings about how the technology can be used to fulfill the tasks. This means that this category still includes the subjective opinion of the interviewees but is not exclusively based on feelings like the perceived usefulness. Regarding the results of our explorative case study, the construct of usability was mentioned disproportionately often. Usability is defined by the ISO Norm 9241-11 (Deutsches Institut für Normung E.V., 2006). Three main criteria define the usability of a software system: the effectiveness to solve a problem, the efficiency of handling the system and the satisfaction of the user. This shows, that working with the system always includes a level of human-computer interaction that is influenced by personal perceptions (Frøkjær et al., 2000). Usability is the most allocated category with 45 statements which shows how important it is for the users that the ERP system covers their requirements. Moreover, we identified service quality and data quality as important variables. Both can be associated with the implementation process of the ERP system (Davenport, 2000). In our case the firm changed their ERP system three years ago. The constructs especially show the importance of involving employees who have to work with a new system in the development and implementation process of the technology and highlight one more time the need for a human-centered design. Statements about the quality of the implementation partner, the implementation process, involvement of the person during the implementation as well as up to now were all allocated to the service quality. According to DeLone and McLean (2003) this category includes the overall support delivered by everyone involved in the system implementation and during the usage. So, the support during the whole lifecycle of the ERP system is important to the users. The category data quality includes information about the timeliness and correctness of the data, as the interviewees describe data quality. The definition matches but does not completely cover the common definition of data quality (Pipino et al., 2002).
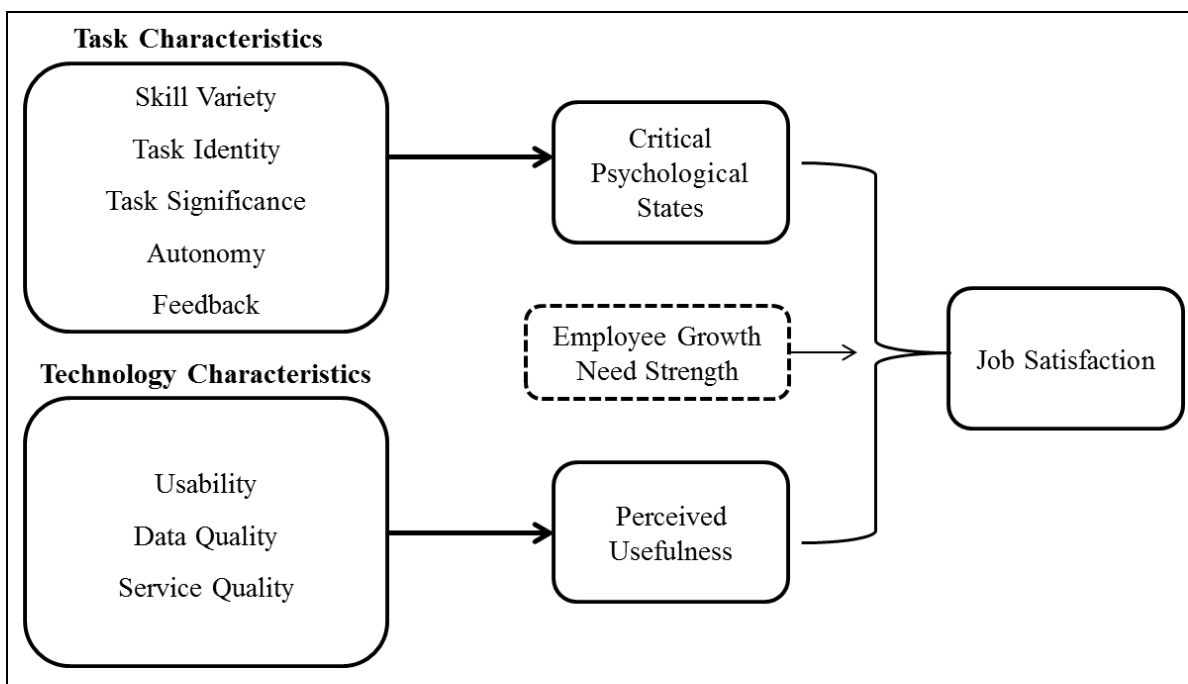
## 5. Extension of the Job Characteristics Model

The results from the qualitative study show the impacts on job satisfaction in our case. The findings indicate a necessity for the development of a theory extension (shown in Figure 2) that will not only explain the job satisfaction with the characteristics of the work in general but needs to integrate the whole work environment and obviously the use of resources, like an ERP system. The composition of the construct job satisfaction is based on two complementary branches. The first branch was formulated in the JCM and refers to aspects of the task (organizational branch). The second and new branch refers to the technological aspects

(technological branch). Both reveal a factual component as well as an area of perceptions and ambitions. The interaction of technological and task oriented aspects and the emotional components of the employees lead to a broad understanding of job satisfaction.

The findings of the interviews show a surprisingly weak impact of the task characteristics on job satisfaction while the evaluation at the end of the interviews showed a very high recognition of the characteristics as well as growth need strength and job satisfaction. During the conversation these task characteristics felt behind the technology characteristics and were thus not mentioned a lot. According to Murphy (Murphy et al., 2012) we assume the use of ERP systems to change the mode of working. Apparently this leads to the high number of mentions of the technological related constructs during the interviews. The work to be done is supported by the ERP system. An assessment of the job must always include an assessment of the technological characteristics (Goodhue and Thompson, 1995).

We hypothesize that job satisfaction partly results of an emotional state from the employee which was already introduced by Hackman and Oldham (1976). Besides the defined critical psychological states, the perceived usefulness of the ERP system is also part of their emotional state and has to be considered in modelling the job satisfaction. These two emotional states are inseparably related following a "sociotechnical" view of Orlikowski and Scott. This view presumes that the social and the material are inseparable. The distinction of humans and technologies is only done analytically (Orlikowski and Scott, 2008). This view moves away from looking at IT as an impact or an interaction with the people, to "examining how materiality is intrinsic to everyday activities and relations" (Orlikowski and Scott, 2008). The emotional states also have to be affected by characteristics from the technology as well as characteristics from the job. The five job characteristics are drawn from the JCM. The validity of this part of the model was already shown by Morris and Venkatesh (2010). Further, we found extending technological characteristics with our case study. We hypothesize that these characteristics have an influence on the perceived usefulness as a variable that describes feelings and an emotional state. We do not claim completeness of the model presented. We want to define the needed extension of the JCM by using explorative research methods.



**Figure 2**: Extension of the Job Characteristics Model

The construct of data quality includes measurable characteristics of the software. The quality of the data provided and the data processing can be seen as a vital characteristic of the software (Pipino et al., 2002). The adjustment of the data processing for a successful ERP use depends on the degree of service quality. With 27 statements service quality is one of the strongest influence factors of the job satisfaction in the qualitative study. This concept demonstrates the strong influence of the user-provider interaction (Delone and McLean, 2003) for assessing job satisfaction. Our research objective was a SME which has implemented an ERP system three years ago. The interviewees express the strong influence of the service quality on their job satisfaction during the whole lifecycle of the ERP system. This leads to the conclusion that user interaction with the service provider plays an immanent role on the technological characteristics and thus to the perceived usefulness of the system.

The strong relationship between the tasks and the suitability of the software to support the task is embodied in the concept of usability. Usability as well as service quality focuses on the user's needs. A high usability can improve the job satisfaction. We only found positive correlated statements for usability and job satisfaction. Usability postulates a high user-interaction (Norman, 2013). The perspective of an ERP system as a socio-technical system can explain part of the answers from the users because it contains both the social sub system as well as the technological (Trist, 1981). This attitude arises from the subjective opinion of the person about the work or about a specific situation at work and describes "the pleasurable emotional state resulting from the appraisal of one's job as achieving or facilitating the achievement of one's job values" (Locke, 1969). So, taking into account the socio-technical view helps to explain results from our case study.

The construct perceived usefulness reflects the strong correlation between the technological, task oriented and user specific aspects. The construct is well tested in several other research approaches (e.g. (Bala and Venkatesh, 2013) and (Davis, 1986)). Perceived usefulness belongs to the technical branch of the extended JCM and expresses the users' feelings about the technology fit to the work. So, we hypothesize that perceived usefulness directly influence job satisfaction and is influence by the technology characteristics.

Our findings lead to three conclusions: (1) job satisfaction is influenced by aspects of the task as well as aspects of the software used, (2) technical and task characteristics can be both formal and perceived and (3) the permanent involvement of the users' support during all phases of the ERP lifecycle has an impact on their job satisfaction.

If the humans as well as the technological resources are in a combination process to create something new, the user is not able to separate the causes of job satisfaction.
Consequential, the definition of a job as a bundle of homogeneous tasks that can be described by job characteristics needs to be revised. The tasks not only include the things the person needs to complete the work but also the tools, like an ERP system, the person needs to do his or her work. Regarding job satisfaction at ERP based workplaces it is not possible to separate the social perspective from the technological. Due to this argumentation and the awareness of the role of technological characteristics categories, we extended the JCM.

## 6. Conclusion and Outlook
Our study had the goal to explore characteristics that influence the job satisfaction of workplaces with ERP systems in use based on the JCM. We derived data from seven interviews in a medium-sized company working with a SAP ERP system. Surprisingly, the constructs from

the JCM theory were only allocated in 19 of 127 statements regarding job satisfaction. The other 98 statements referred to the technology. These statements could be allocated to four constructs that are known in IS literature: perceived usefulness, usability, data quality and service quality. For workplaces using technologies in their everyday work it is important to consider the satisfaction of the users with their tools. This is especially compiled at jobs working with ERP systems because these systems influence the whole working environment. The results led to the conclusion that the job satisfaction of the users cannot be investigated separately from the satisfaction with the system. These two strains cannot be considered separately but rather need to be merged to understand job satisfaction at workplaces which are using technology every day.

Concluding, we derived a conceptual model to explain job satisfaction for ERP based workplaces which has to be tested in future research. We do not claim completeness of the job characteristics as well as the technology characteristics. Other studies should investigate if there are missing characteristics. Companies of different size and the implementation of other ERP systems could be interesting research questions for further studies.

A limitation of our study is that only one case company was examined which obviously limits the generalizability. So, we cannot conclude if the results are industry or company size depending. Nevertheless, the exploratory nature of our research produced valuable results that allow us to build new knowledge towards a model of job satisfaction for ERP based workplaces. We are preparing for collecting more data from other case studies to refine and confirm our model and we are finally planning to test the model with quantitative research methodologies to receive representative results concerning the validity of our model.

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