

A Qualitative Approach to Examine Technology Acceptance

Completed Research Paper

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Abstract

The research field of technology acceptance and software acceptance is a fertile field in the discipline of MIS. Acceptance research is mainly affected by the technology acceptance model (TAM). The TAM is counted as the major guideline for acceptance research. But recently more researchers discover the deficits of former acceptance research. The main cause of the criticism is the focus on quantitative research methods. We will show this with the help of former meta-studies and a literature review. Quantitative approaches are basically appropriate for the testing of theories. The development of new theories or constructs is followed to a lesser intent. In the article we will show how a qualitative approach can be used for theory-construction. We will introduce a qualitative research design and show how this approach can be used to develop new constructs of acceptance while some existing constructs taken from TAM and related theories cannot be confirmed.

Keywords: TAM, technology acceptance model, theory building, research methods, qualitative research, quantitative analysis, project management software

Introduction

Since the eighties the acceptance of software applications has become a major area of research in (Management) Information Systems. The continuously varied, augmented and improved models and theories reflect the change in the importance and functionality of information technology. The technology acceptance model (TAM) is considered to be the initial model for numerous followers in the field. It introduced the core of technology acceptance: the measurement and interpretation of Perceived Ease of Use (PEU), Perceived Usefulness (PU) und Intention to Use (IU) as main constructs that impact acceptance. Until today, new variants of TAM still emerge.

Studies into the acceptance of software products apply predominantly quantitative methods which have deficits when the findings shall be implemented in practice. Furthermore, there is a problem in the common building process of acceptance theories. This is often done by combining already existing theories which makes it hard for so far unknown constructs to find entry into the models. Nevertheless, such constructs might turn out to be of high relevance to explain software acceptance. In this sense, the prevalent theory building process can be characterized as incomplete.

In this article we aim to exhibit the advantages of a qualitative approach. We have applied interviews with different groups of experts (users, consultants, software producers) to reveal factors which impact the acceptance of Project Management Software (PMS). Another goal of the inquiry has been to ask for best practices and concrete recommendations for action in projects which implement this kind of software applications. New domain specific constructs and the refutation of constructs which are often regarded as relevant to technology acceptance substantiate our opinion that the theory building process can be improved with a qualitative course of action. We present our findings and consolidate them in a framework which is not only useful to explain software acceptance but also allows for concrete recommendations.

Software Acceptance Research

Overview

The most widely applied model in technology acceptance research is the technology acceptance model which was developed and introduced by Fred D. Davis (1989). Since then it has been one of the most cited and most modified theories in IS research (Bagozzi, 2007). Central element of TAM is the user's attitude towards using a technology. This attitude has a direct impact on the actual use, which serves as an indicator for the software acceptance. TAM derives its constructs from the Theory of Reasoned Action (TRA) as well as from the Theory of Planned Behavior (TPB). Hence, the attention focuses on the Behavioral Intention (BI). In its original version TAM comes along with four constructs. The attitude towards using a technology is constituted by Perceived Usefulness (PU) and Perceived Ease of Use (PEU). These constructs influence the Intention to Use (IU) which in the model precedes the actual use.

In various modifications TAM has been extended or applied to different kinds of software, mostly generic software products. According to Lee et al. (2003) after the early phases of model's introduction and validation the following modification streams can be distinguished:

- Model extension: Researchers examine antecedents or external variables, often including individual, organizational, or task characteristics. Many factors (for example result demonstrability, image, and compatibility) were gathered from related theories such as Diffusion of Innovation Theory, or Social Cognitive Theory.
- Studying external variables which moderate the relationship between PEU and PU and their explications, such as demographic factors or personality traits.
- Studying the TAM in particular application scenarios, e.g. special types of software, different environments, tasks, and subjects.

In recent years much attention has been given to the work of Venkatesh and different co-authors. Very remarkable is for example TAM 3 (Venkatesh and Bala 2008) which covers 11 explications of PEU and PU as well as numerous moderating relations between the constructs and external factors such as experience and voluntariness. Currently the research focus lies on analyzing TAM's relevance in the context of new technologies (van der Heijden 2004; Sykes et al. 2009), internet technologies (Venkatesh et al. 2012) and – in this context – with trust (Wang and Benbasat 2005).

A broader perspective on technology adoption is provided by the appropriation research stream. In this community the whole lifecycle of use (Schwarz and Chin 2008) is analyzed allowing for different use practices (Orlikowski 2009). The aim is not just to examine predictors of use, as it is the case in TAM studies. It is rather the interactions between man and technology that are analyzed (Beaudry and Pinsonneault 2005), and thereby to consider unexpected practices and changes in the course of the appropriation process (Pipek and Wulf 2009). The underlying paradigm seeks to dissolve the duality between men and technology. Other than typical TAM studies, this approach is characterized by a larger variety of methods (e. g. DeSanctis et al. 1994; Majchrzak et al. 2000; Orlikowski 1992). At this point we don't want do discuss the methods applied in appropriation research in detail, since our work especially focuses on the acceptance of software products and not on a broader examination of the appropriation process.

Shortcomings in TAM Research

The technology acceptance model and its explications dominate the acceptance research, and, therewith also the methodology for collecting data. Quantitative approaches which are based on TAM are most prevalent in this research stream (Lee and Baskerville 2003). This strong TAM-orientation comes with severe advantages for the researchers. Amongst others these are: TAM is a proven and reliable model. Due to its long tradition TAM provides a well-defined procedure as well as widely accepted interpretations of the results. Furthermore, one can almost always expect findings which are interpretable. The TAM studies have produced a rich set of findings concerning a variety of technologies and different user groups. Many factors have been explored and empirically tested (Wu 2012). TAM is able to explain more than 50% of the variance of Intention to Use / Behavioral Intention (Lee et al. 2003; Schepers and Wetzels 2007; Wu 2012). Moreover, TAM is easy to handle and extremely versatile, since it brings tested, pre-defined measurement instruments. The model's parsimony is a strong driver for its wide spreading (Bagozzi 2007) and surely accounts for its acceptance. Due to its universal character TAM can be applied to any kind of software. Furthermore, the generalizability of the survey instrument makes the results of different studies comparable. All of these points have made the TAM one of the most cited models in Information Systems. However, exactly those points lead to questioning the model's expressiveness and relevance. TAM, which in its basic version comprises PEU and PU, is neither suited for explaining complex decision processes nor forecasting actual behavior (Bagozzi 2007). Furthermore, focusing on Intention to Use as a single predictor of use can be criticized (Wu 2012; Orlikowski and Baroudi, 1991). Most models are just able to explain about 40% of variance of Use (e.g. TAM3 has an R² of 31-36%) (Wu 2012). Therewith it differs from the results of the explained variance of Intention to Use. This indicates the limited correctness of the conclusion that the Intention to Use is always followed by an appropriate activity. It is also important to note that even Intention to Use as well as Use are controversially discussed constructs (see for Use: Seddon 1997; and in general Wu 2012). At the same time, more and more explications of PEU and PU lead to even more complex theories. For example, Venkatesh et al. (2012) and Venkatesh et al. (2003) developed models which are difficult to handle due to their complex assumptions concerning moderating effects. In fact, the reason why for example demographics moderate the relationship between the constructs has not yet been resolved adequately. Often, a proper theoretic argumentation is missing when assumptions concerning moderators and constructs are made (Bagozzi 2007).

In the discourse of some prominent acceptance researchers titled „Quo Vadis TAM” (Hirschheim 2007; Benbasat and Barki 2007; Goodhue 2007) the authors emphasize the importance of considering the work environment. Thereby, they explicated e.g. the important role of the type of software and concluded with an appeal to further investigate such categories. Also, important key-variables, as for example corporate culture, have been up to now not considered comprehensively neither described clearly, for example in the form of Facilitating Conditions which mainly reflects the surrounding infrastructure (Venkatesh and Bala 2008). A main reason for this is the nature and the focus of the studies. Many authors examine the acceptance of generic software products like text proceeding or the Internet which are wide spread products with a great number of identical installations (see for example Sykes et al. 2009). This kind of software is typically characterized by ease of use, homogeneous use cases (as for example writing a text), independency of qualification and role of user, and loose coupling to business processes. However, those characteristics cannot easily be transferred to software that supports specific operational tasks as it is for example the case with ERP systems or project management software. Thus, for analyzing these specific kinds of software, existing acceptance models are only to a limited degree applicable. Furthermore, the single focus on the user's perspective is an additional aggravating factor.

Another shortcoming of the traditional TAM research is that many authors are content to explain the acceptance of a technology. In our opinion, developing recommendations to increase the acceptance would greatly contribute to the relevance and practical implications of scientific work. Furthermore, the period examined by TAM researchers usually is quite short. Even in the case of longitudinal studies the focus mostly lies on the initial contact between user and software followed by a very limited period of time (usually a few months) (see for example Lee and Baskerville 2012). However, it seems to be reasonable to consider the complete life-cycle beginning with preparing and selecting the software up to the permanent and company-wide usage (Project Management Institute 2008). In doing so, factors that vary over time could be considered and analyzed in-depth, which hardly can be done in quantitative studies. With this article we would like to introduce a qualitative approach which helped us to overcome the mentioned shortcomings.

History and Meaning of Qualitative Methods in Technology Acceptance Research

Since the end of the nineties researchers in the IS field have been encouraged to use more qualitative research methods instead of just focusing on quantitative ones (Hirschheim and Klein 2012). While the latter are still dominant, a tendency towards a greater acceptance of qualitative methods is discerned. Especially, the increasing number of publications confirms this development (Palvia et al. 2003). In contrast to American publishers European journals and conferences traditionally pay a bit more attention to qualitative oriented research (Chen and Hirschheim 2004). The reasons for the dominance of quantitative methods in IS in general has been much discussed which we don't want to continue at this point. However, the rarity of qualitative methods might lead to run over important and relevant questions. Complex organizational settings as they are usually given when researching in the IS field can usually very well be examined with qualitative research methods (Palvia et al. 2003).

Table 1. Overview of TAM Meta Studies

Reference	Period	No of considered (identified) articles	Considering qualitative studies	Key Findings
King and He (2006)	1998-2006	88	No	TAM is a valid and robust model which is able to display different effects of user and usage types.
Lee et al. (2003)	1986-2003	101	Yes	TAM has progressed continually and was elaborated by researchers, resolving its limitations, incorporating other theoretical models or introducing new external variables, and being applied to different environments, systems, tasks, and subjects.
Legrís et al. (2003)	1980-2001	22 (80)	No	TAM is a useful model, but has to be integrated into a broader one which would include variables related to both human and social change processes, and to the adoption of the innovation model.
Ma and Liu (2004)	1989-2003	26 (91)	No	Both, the correlation between usefulness and acceptance, and between ease of use and acceptance is weak.
Schepers and Wetzels (2007)	1989-2006	51	No	Results indicated a significant influence of subjective norm on perceived usefulness and behavioral intention to use. Moderating effects were found for all three factors.
Turner et al. (2010)	1989-2006	73	No	The results show that behavioural intention to use is likely to be correlated with actual usage. However, perceived ease of use and perceived usefulness are less likely to be correlated with actual usage.
Wu et al. (2011)	1989-2010	128 (203)	No	Results indicate a significant influence of trust on TAM constructs. Moderating effects are found for most pair-wise relationships.

As mentioned in the previous paragraph, the dominance of quantitative methods is particularly apparent in the acceptance research stream. For example, Lee et al. (2003) conducted a meta-analysis and found out that more than 90% of acceptance studies used questionnaire-based field studies. Only three out of 101 TAM papers incorporated qualitative data, such as content analysis. As Table 1 shows, other meta-analyses and TAM literature reviews simply never include qualitative studies; they rather just focus on statistical findings of the articles to be considered.

As shown in table 1 the work of Lee et al. (2003) is actually the only one which takes articles with qualitative approaches into account. The study is actually more than 10 years old. In order to find out to what extent researchers since that time have applied different approaches or even if a new trend can be identified, we conducted an additional extensive literature review. We searched in leading IS journals (see table 2) for articles published after 2003. The keywords including but not limited to “TAM”, “acceptance” “technology acceptance”, “software acceptance” are used to find relevant articles. An overview of the results is given in Table 2.

Table 2. Technology Acceptance Research since 2004		
Rank	Journal title	Count of papers
1	MIS Quarterly	12
2	Journal of the Association for Information Systems	9
3	Journal of Management Information Systems	4
4	Information Systems Research	3
4	Information Systems Journal	3
6	The Journal of Strategic Information Systems	1
Further journals taken into account: Computers and Operations Research, Decision Sciences, International Journal of Electronic Commerce, Journal of Information Technology, Journal of the ACM.		

We identified 32 papers dealing with technology acceptance. All of those are basing upon theory-driven argumentation and data gained from quantitative collection. Generally, quantitative analyses aim to expose and test relationships between constructs and variables, applying statistical methods. Thereby, the researchers either investigated how specific variables like culture (Srite and Karahanna, 2006) or trust (Turel et al. 2008) affect the acceptance, or, they analyzed already known relationships in greater detail. A vast majority of acceptance studies takes the following steps:

1. Studying related literature.
2. Adopt suitable constructs from existing theories.
3. Adopt suitable constructs based upon an argumentative framework.
4. Combining constructs in one (new) model.
5. Hypothesizing relationships.
6. Empirically testing hypotheses / model with quantitative methods.

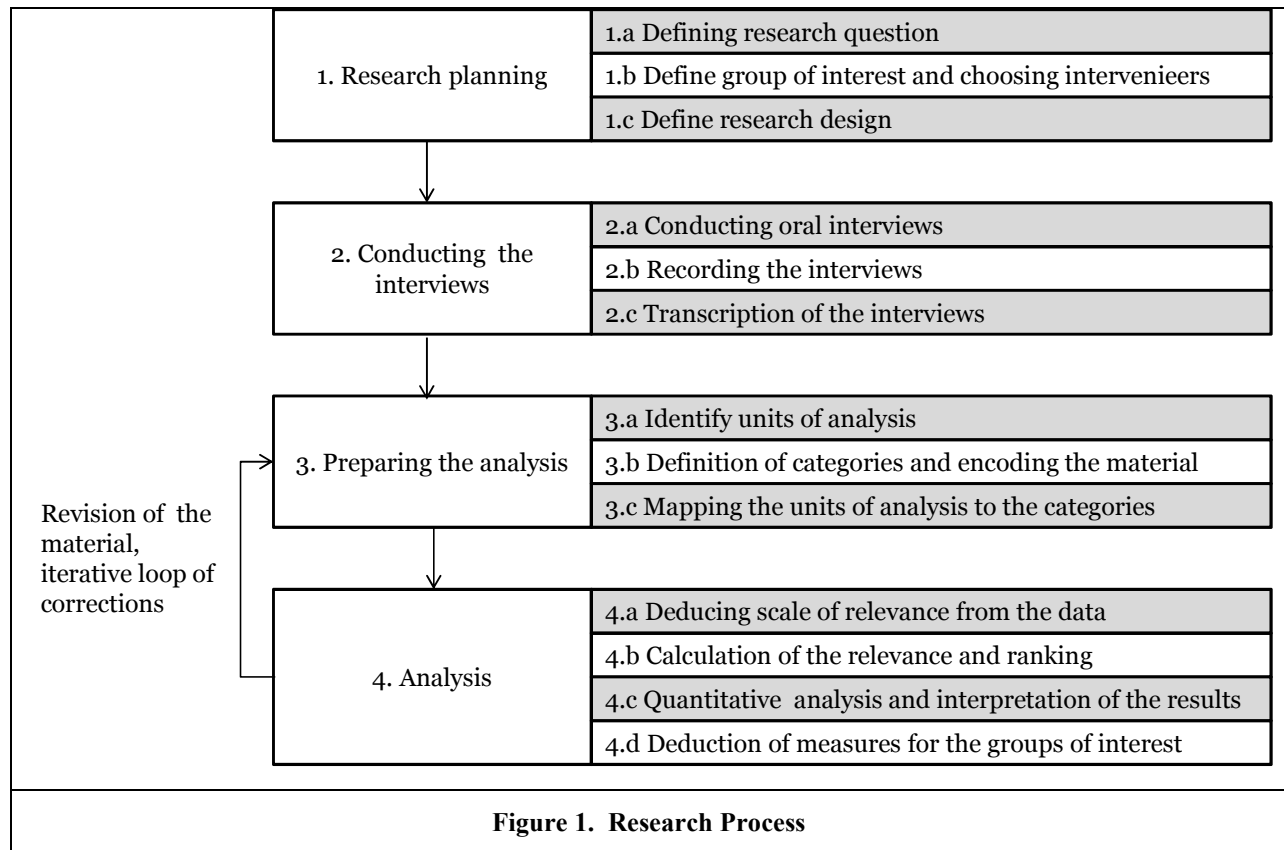
Qualitative methods are hardly ever used to explore backgrounds and details of the research question(s). Quite often this makes the authors unable to comprehensively analyze complex relationships like the interaction between man and technology. Also, the focus on quantitative questionnaire-based surveys may lead to oversee relevant factors of influence (Wu 2012). However, the (very few) studies where acceptance is investigated with qualitative methods show, that results can be achieved which move beyond well-known theories. We found, for example, articles where the impact of leadership (Kavanagh and Ashkanasy 2006) or personality (Ouadahi 2008) on technology acceptance is examined with qualitative methods. Furthermore, as for example Zoellner et al. (2008) or Vreede et al. (1998) showed, technology-specific factors sometimes play an important role for the acceptance. However, those studies, which often generate interesting and relevant results, don't seem to find their ways into highly ranked journals. Thus, in the field of relatively unexplored software products, we dare to question the relevance of studies which just rely on quantitative empirical data for theory testing. Potentially relevant constructs may be overseen in models that are built upon theory-based argumentation without taking qualitative empirical data into account.

The Examination of Technology Acceptance of Project Management Software – a Qualitative Research Design

Research Design

In the following, we describe our research project. We analyzed the acceptance of project management software PMS using a qualitative research approach. PMS products are used to support users by processing in all states of a project. We chose project management software as a typical surrogate of utilitarian software, as it is defined as: “a class of computer applications specifically designed to aid with planning and controlling project costs and schedules” (Project Management Institute 2008). Project management software is an array of software to support all specific project management processes and methods and is characterized by a clear task orientation. PMS is used in scenarios with a potentially huge number of heterogeneous users with different needs and a specific knowledge-pool. The working environment and user group are different from so called generic software products like text processing software (e.g. Microsoft Office Word) or spreadsheet software (e.g. Microsoft Office Excel). PMS can rather be vaunted as productivity-oriented software tool. This is why it can be taken as an example for most information systems of the utilitarian-software group like ERP-Systems.

The data of this contribution were collected in a qualitative research, following the research ideas of Mayring (Mayring 2010) and the qualitative content analysis. The detailed advance is shown in figure 1 below.



1. Planning the research

The underlining research question of the approach described is:

Which attributes, features and characteristics of the PMS, the users of the software and the enterprises using the software have a significant influence on the acceptance of the PMS, regarding the direction of influence?

In past the term “acceptance” could only be captured with the help of auxiliary constructions like intention to use or use (measured e.g. via time spent with the software). It was a basic element of our research to define the term “acceptance” clearly to constitute a clear and common understanding of “acceptance” for all participants of the study. Therefore, we defined acceptance as: real use of the software under strict consideration of the role of the user and his or her task area. This definition respects the different actual needs using the software. For example will project managers have a more intensive use of the software, when they create project plans and manage actual projects with the software than normal team-users or even than the management-board will show. Usually team-members use the PMS-system mainly to report activity list updates (Project Management Institute 2008), while the management-board is mainly interested in reports. The different needs of the user groups have to be taken into account.

We chose an exploratory research design. The survey was conducted with the help of an interview guideline for semi-structured interviews. This advance is clearly different from other kind of qualitative surveys as for example observational research. It is one advantage of the semi-structured interviews that we were not bound to a single PMS-use-situation. In fact we were free to combine the experiences of different user and expert groups in a multitude of software-use-situations. This research approach gave us the opportunity to determine the whole software-use-process from the beginning to the real and enlarged use. In contrast an observational research would have taken several months or even years to capture the whole software-use-process.

In order to get deep insights from different perspectives it is intended to address different stakeholder groups of the PMS-use (i.e. users, producers of the software and using enterprises). So we carefully chose interviewees from different stakeholder groups according to their experience and qualification to cover a multi-perspective scope of PMS-use. In the present research we chose participants in approximately equal shares from the stakeholder groups: users, software-producers and software-consultants. The first group is characterized by their direct contact to the software and their knowledge about the real software requirements. They know the requirements of the using team members and the applying enterprises from the beginning of the software implementation to the continuous use. The producers of the software offer expert-knowledge about the changing requirements of the user groups during all phases of the software-use, the broadening software application and the technically feasible. Additionally, software-producers often attend the software implementation process and the further use. The group of software-consultants combines the knowledge of the groups mentioned before. Furthermore they provide an external view and knowledge. All interviewees had distinct and broad experiences that go beyond a single experience of software use. It is one advantage of the research design which allows to combine the different cognitions, perceptions and experiences of the three groups.

2. Conducting the research

We conducted 14 interviews in ten weeks with different PMS-experts. The interviewees were selected according to the above mentioned criteria. Above them there were 4 users, 7 suppliers, and 3 consultants, each of them with many years of experience in the PMS-field. All interviewees accepted the recording of the interview. The records were used to enable the transcription of the interviews afterwards.

The interview guide, which is partially displayed in figure 2, was structured as follows: First we had a short preliminary-talk that was used to lift the spirits (Walsham 2006) and to ensure a common understanding of the term “acceptance”. Every participant was asked to describe a typical PMS-implementation-process from the beginning to the constant software use. Additionally they had to go into the details of the software acceptance and describe ways that caused in the past an increasing or even decreasing software-acceptance. Afterwards, the interviewees were asked to summarize the three most important influence factors on software-acceptance from their own view. In the last part of the interview, the experts were asked to assess given TAM-constructs. The scale was preset from 0 = no influence up to 3 = absolutely essential. To compare these summarizing statements with the statements of the interviews allowed us to check the inner-coherence of the statements.

- Have you ever attended or coordinated a PMS implementation?
- Have you gained experiences with learning a PMS?
- Have you experienced barriers?
- Please give as many examples as possible and describe them.
- Which kind of action is necessary to be taken to lead users to and keep them using PMS?
- Which PMS characteristics create and foster acceptance?
- Which kind of action can companies take to increase PMS acceptance?
- Please rate the factors you named and the proposed ones from 0 (irrelevant) to 3 (essential).

Figure 2. Excerpt of the interview guideline

3. Preparing the analysis

The generated transcripts can be seen as the analysis unit of the research. According to the approach of formal structuring (Mayring, 2010) relevant statements were extracted and encoded to core-statements. Using rules for encoding reduced the complexity of assigning statements to core-statements and

categories. The main idea of this content analysis is, to give explicit definitions and rules why a statement can be coded with a category. The underlying categories were taken from former TAM-literature and –if there was no suiting category available- directly deduced from the statements. Examples of the applied coding procedure are presented in table 3.

Statement	Core Statement	Category	Relevance
“You have to know PM methods. One problem is that many people do not know what to do with the software. They believe, with buying the PMS, they get project management competencies, automatically.”	Understand PM processes	PM experience	1
“Voluntariness is unimportant. If I implemented a tool and left it to the employees to use it or not, the PMS would not be used.”	Voluntariness is not relevant	Voluntariness	-1
“It is also essential to train the management. If they are not willing to be trained, people from their departments will also refuse learning and using the PMS.”	Kind of training: involving all levels	Training	2

The orientation to given categories enables the relation to past research and existing constructs of technology acceptance. Also it means, categories of former TAM-research that were not approved in the analysis unit, can be excluded from the category system. Underlying TAM-categories were mainly taken from TAM2 (Venkatesh and Davis 2000), the research model of Wixom and Todd (Wixom and Todd 2005) and the Task-Technology-Fit-Model (Goodhue and Thompson 1995) as they imply a very high task-relation. The need of a high task-relation is motivated by the reviewed software class. Categories from further technology acceptance research were gradually proved.

The material was screened a number of times in so called feedback loops and all categories were revised. Eventually the categories were gathered and reduced to main categories, all in respect to the reliability. Statements with no possible assignment to given categories were converted to new categories. The feedback loop ended when all statements could be clearly assigned to at least one category.

A re-assignment by different persons was conducted to ensure the requirement of objectivity of qualitative research (Flick et al. 2007) and the summative reliability of the results.

4. Analysis

In the next step the categories identified were sorted and ranked by relevance. The ranking of the categories was necessary to reach the mandated parsimony of the research model.

For this reason we counted the references of the categories (frequency) and we evaluated the content (relevance). Four different values of relevance can be distinguished: explicit rejection (-1), no reference (0), reference (1) and reference with accent (2) by the interviewee.

As indicators for the reference with accent we identified expressions like: ‘it is (very) important that ...’ or ‘never forget that...’. It is important to include the factor of relevance, as often interviewees mentioned statements to exclude certain categories. The simple counting of the frequency would be misleading in this case.

Furthermore we weighted in how many interviews the particular category was (positively) mentioned (interview-frequency). We assumed that categories with a high interview-frequency matter more.

The result of the context analysis is a set of real influence factors of software acceptance. For each influence factor we receive an explicit definition, a coding rule, a deeper description and a value for the ranking (in order to create a quantitative ranking). For most factors we can also describe clear measures to increase the acceptance. To show the whole coding agenda would exceed the requested degree of the contribution. Hence we will describe just some of the major findings and give some examples.

Results

In 14 interviews we extracted 396 statements concerning the software acceptance. In average we extracted 28.28 statements per interview. 33 different categories could be identified. 15 of these categories had no direct relation to familiar TAM-models. These 15 categories can be classified in three different major-categories as shown in figure 3.

Project- situation	Perceived project success
	Adaptability to project processes
	Project management experience
	Task-Status
	(Project management-)maturity
	(Project management-)role
	(Project management)-standard-orientation
	(Project management-)role
Perception	Trust in supervisor and co-workers
	Trust in data-security
	Quality of (network) interfaces
	Perceived capital availability
Implementation process	Kind of training
	Kind of involvement in the implementation process
	Information politics at implementation
Figure 3. Developed categories	

The first group refers to the certain project environment. It shows the important influence of the task-fit. Categories of perception summarize feelings and estimations of the software-users applying the data- and social security. The most complex group of categories is the group of the implementation process. The categories combined here, show a strong link to the implementation process of the software. Because of their high complexity they can't be represented in common quantitative questionnaires. Moreover they include detailed descriptions of best practices which were compared and converted to detailed strategies.

As mentioned before, we asked the participants of our research to assess existing TAM-categories. Table 4 shows the assessment the given TAM-categories in combination with the ranking these categories received in the interviews. In the following some of the major findings will be discussed.

TAM-category	Results of the open interview			Results of the assessment	Comment
	Relevance	Frequency	Interview-Frequency	Value	
Experience	43	40	10	34	Transformed to PM- and Software experience
Job Relevance	29	22	12	34	
PU	29	24	9	34	
Output Quality	27	24	12	33	
PEU	44	34	11	32	
Result Demonstrability	1	1	1	33	
Subjective Norm	1	4	2	26	Below average
Voluntariness	1	8	2	14	
Image	1	1	1	13	

Regarding the given categories experience, perceived usefulness and perceived ease of use provide the highest values of relevance, frequency and interview-frequency. Over all categories the highest values were received for the categories of the implementation process (65/62/11) and adaptability (58/47/14), which are new categories.

The interviewees often split experience into software- and PM-experience. This is the reason why experience cannot be taken as a pure given category. It is moreover enriched with context in the qualitative interview and was -according to this- separated to software- and PM-experience. This enhancement of the task-context can also be observed at other constructs like perceived usefulness and perceived ease of use, but not that strong and universal.

Most interviewees agreed in their estimation of subjective norm (SN), voluntariness and image. SN e.g. is a very famous and stable construct in acceptance research (see e.g. Venkatesh 2000). In the recent research it was not only not described in the interviews but also often denied in the assessment of the constructs. The coherent opinion about SN is, that it plays no important role for the acceptance of task orientated software like PMS. The table can be taken as a proof of the contextual coherence of the statements and assessments.

Discussion

The qualitative research method described here, was meant to encounter the deficits of prior quantitative technology acceptance research. The achieved model of PMS technology acceptance includes more than the well known basic influence factors of the TAM. The context and correlations of the factors identified can be defined and specified.

With the help of the qualitative advance we identified a bunch of acceptance factors that could not be derived from former theories. The developing character of the data-analysis makes this research approach a theory building one, as we did not only refer to well known acceptance factors but deduced new ones from the databases.

One example for the richer context of the gained influence factors is the group of categories concerning the perception of the user. The way users sense their personal and job-related situation while they are using the software plays an important role for the acceptance of software. Trust in co-workers and supervisors was often mentioned in the interviews. The way trust affects the perception of acceptance changes with the role and the experience of the user. So trust is somehow related to experience, training and the project situation as well as to the implementation process.

To show these different impacts referring to time and project-situation would generate a too complex setting to be sampled in a traditional quantitative questionnaire. Maybe with the help of the construction of moderating effects the cohesion could be formed approximately.

With the help of the qualitative research all categories and factors can be effectually described. There is no need to reduce the context in a way to create a quantitative scale. The implementation process e.g. can hardly be measured with the help of three or four quantitative items. It is the same with the perception of security.

An additional advantage of the presented research process is the manageable number of participants. The researcher is asked to choose potential interviewees who have the qualification needed for the research. Scientists do not have to come back to an unqualified sample (e.g. of students) to achieve the rigor needed. This even allows the exploration of software products with a very high and specific store of knowledge and homogenous requirements. This widens the spectrum of possibilities. When there is no high rigor to achieve, even specific applications can be explored. The researcher is no longer dependent to generic software products with high number of homogenous users. Additionally there is no need for the participants of the interview to be in exactly the same stage of software utility, as we can find it in prior research (see e.g. Brown et al. 2010). User, producer of the software and consultants can report from different phases of the software implementation and use-process.

Picking out the interviewees allows the concentration on the real use of the software. The missing reference to the field of application was one disadvantage of prior research (Bagozzi 2007), which can be corrected with the help of qualitative research.

Asking different stakeholder groups of the software utilization can help to discover difficulties and problems of the application, to externalize the problems and to negotiate potential solutions. For this purpose it is important to regard the particular role of the software user. It is typical for information systems to be dependent from the task and the operational environment. The status of the tasks and the organizational culture has to be regarded in the discussion of potential acceptance factors.

Regarding the information retrieved the present research can be denoted as extensive. The particular interaction between researcher and interviewee was shaped by:

- Discussions,
- the possibility of further inquiries and
- the detailed description of the implementation and use-processes.

According to this, detailed strategies and measures could be formulated to increase technology acceptance, e.g. for the way of social software-trainings. All strategies can be assigned to the relevant stakeholders of the implementation and use-process (producers, users and enterprises implementing the software). In comparison to former TAM-research this means a real and measurable practical benefit. In former times it was the aim of TAM-research to identify factors that have a significant influence on the technology acceptance. It was not the goal of the quantitative TAM-research to discover ways to increase the acceptance. With the help of qualitative data, we are now able to describe and measure the relevant factors of software acceptance and to manipulate them.

Beside the advantages mentioned, the present research is not entirely free of errors. Mistakes caused by researcher in the interpretation of the statements cannot completely be eliminated. The reduction of the interviews to pure statements without the context of the situation leads to a diminishment of the subject matter. Above all the orientation along given categories from prior research can be discussed. The use of those categories may have a large influence on the further interpretation and development of the new categories. But we chose this way, because even theory construction cannot abdicate prior scientific findings. In the present approach the interviews were held open without specific regard of former

theories. So the interviewees can be regarded as nonbiased. This can be proven, if we regard the famous construct of subjective norm (Venkatesh 2000). SN (as well as Image and voluntariness) was refused by the majority of the interviewees both in the qualitative interview and in the following assessment of TAM constructs.

Conclusion

To date, qualitative research to examine technology acceptance has to be denoted as underrepresented. Recently one of the most prominent representatives of quantitative TAM research (Venkatesh et al. 2013) has published an appeal towards a broader spectrum of applied research methods in IS. He provides guidelines for conducting mixed-methods research, including both, quantitative as well as qualitative parts. Our approach addresses shortcomings of pure quantitative studies and offers a complementary way for theory building. Project Management Software and other business applications resemble each other in their strong focus on task and business process support and the heterogeneity of users. Therefore, we strongly believe that our approach can be successfully applied to other business software products such as ERP systems. A disadvantage of our approach is that it takes a sufficient number of trained researchers to ensure the objectivity of identified categories. The effort to identify appropriate interviewees, during the interviews and subsequent analysis is higher in comparison. However, this is a general objection against qualitative research and not specific to our approach. For a discussion see Walsham (2006). Furthermore, it is hardly possible to question such a high number of users like it can be done with standardized questionnaires. On the other hand, qualitative research offers more scope for interpretation.

The main contribution of this paper is the evidence that the presented qualitative approach allows for a theory building process. Our suggestion offers a content rich method which allows to identify and to discuss impact factors on software acceptance. In the theory building process influencing parameters can be directly derived from the statements of the interviewees. A direct dialogue replaces the need to work with controversial constructs like use or intention to use. The results of our study include constructs which would not have been revealed in traditional acceptance studies. On top of that, we could clearly exclude some constructs like image and subjective norm. Thus, the qualitative findings of our research contribute to TAM theory by identifying constructs which play a crucial role in a PMS context. Actions to improve software acceptance in practice can be recommended. The direct dialogue between researcher and specialist allows for further inquiry into experiences and best practices. Coherent and comprehensible constructs are derived and linked to suggestions how to proceed. The introduced qualitative approach can be used to build a theory which can be subsequently tested quantitatively. For instance, the qualitatively identified constructs and their relations can be analyzed quantitatively using statistical procedures like LISREL or PLS. Such a multi-method design can be seen as a way to address the often conflicting goals of relevance and external validity.

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