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Ken Jochmann
foolography GmbH Greifswalder Str. 9, ken.jochmann@gmx.de

Lennart Jaeger
German Graduate School of Management & Law, lennart.jaeger@ggs.de

Victoria Reibenspiess
German Graduate School of Management & Law, victoria.reibenspiess@ggs.de

Andreas Eckhardt
German Graduate School of Management & Law (GGS), andreas.eckhardt@ggs.de

Julia Kroenung
University of Mannheim, jkroenun@mail.uni-mannheim.de

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Completed Research Paper

Ken Jochmann
foolography GmbH
Greifswalder Str. 9
10405 Berlin, Germany
ken.jochmann@gmx.de

Lennart Jaeger
German Graduate School of Management and Law
Am Bildungscampus 2
74076 Heilbronn, Germany
lennart.jaeger@ggs.de

Victoria Reibenspiess
German Graduate School of Management and Law
Am Bildungscampus 2
74076 Heilbronn, Germany
victoria.reibenspiess@ggs.de

Andreas Eckhardt
German Graduate School of Management and Law
Am Bildungscampus 2
74076 Heilbronn, Germany
andreas.eckhardt@ggs.de

Julia Kroenung
University of Mannheim
L15, 1-6, 68159 Mannheim, Germany
jkroenun@mail.uni-mannheim.de

Abstract

Information systems (IS) are being used to fulfill users' purposes. These purposes can include both the help for job tasks as well as fun and entertainment for the individual in his private life. Prior IS adoption research primarily focused on these purposes and observed their impact on individuals' attitudes. With the increasing diffusion of mobile IS, such as tablet computers and smartphones, for communicating and gathering data independently of an individual's location, an additional theoretical construct gathers importance for the IS adoption process; how fast this purpose is transferred to the user based on the individual's perception. In order to observe the importance of the purpose transfer as well as its impact for an individual's attitude toward using mobile IS, we conducted an empirical study with 97 mobile IS users. The results show that individuals' attitude towards mobile IS is not only driven by the actual purpose in terms of hedonism and utilitarism but also by how fast the purpose is transferred to the individual. The results also reveal a dominant role of purpose transfer for the shaping of different antecedents for attitude in a way that those users who perceive a fast transfer of the aimed purpose both perceive mobile IS as more useful and enjoyable to use. Based on the results of our study, implications for future research on the adoption of mobile IS and the focal role of purpose transfer are provided.

Keywords: Mobile Information Systems, Purpose Transfer, Purpose, Attitude

Introduction

In today's digital world individuals tend to be connected to their private and work environment almost 24/7 via their smartphones (MacCormick et al. 2012). By way of example, the number of smartphone users is expected to pass 2.32 billion in 2017 (The Statista Portal 2016). Smartphones as an example of mobile information systems (IS) are a constant companion in individuals' daily life land thus users rarely experience any kind of "offline" periods (Dery et al. 2014). Mobile IS enable rapid search, access and retrieval of information and support communication and collaboration between individuals in and off the job (Deng et al. 2012). In this regard, mobile access is the key component of mobile IS and mobility the key expectation of its users (Middleton et al. 2014).

The tremendous development of technological infrastructure and data transfer via mobile IS has changed the whole way how human beings communicate and collaborate as they are now able to work wherever they are and whenever they want (Dery et al. 2014). Some of the advantages of ubiquitous and near-constant connectivity are fast access to information and people, independently from time and location leading to greater autonomy and flexibility (Mazmanian et al. 2013). Along with the diffusion of these new IS, new norms concerning autonomy, work modes, attitudes, and social interactions have emerged in organizations (Mazmanian et al. 2013).

So far, IS researchers have mainly investigated the effects of the use of mobile IS in specific IS research domains such as knowledge management, individual digitization, and social media (Durst and Runar Edvardsson 2012). However, IS research from a more theoretical standpoint targeting the adoption of these systems is still scarce. In fact since the work by van der Heijden (2004) more than a decade ago distinguishing information systems according to its either utilitarian or hedonic nature there is hardly any fine-grained theoretical research observing the adoption of IS in relation to its initial designed purpose to the user.

As with every IS, which in general refer to systems that are designed to assign technology generated informational raw material (e.g., data) to a functional purpose, mobile IS are also supposed to fulfill a certain purpose. While mobile IS help individuals to make better and timelier local decisions, and solve tasks more effectively (Von Krogh 2012), IS research has also found that the hedonic value of mobile IS is also important to its users (Lin and Wang 2006). Thus, both utilitarian and hedonic purposes seem to be relevant for mobile IS users. While prior research has also attributed this two-fold purpose of systems to web-related technologies (e.g., e-commerce applications) mobile IS are unique by emphasizing the aspect of mobility and its consequential independence of time and location for individuals while searching for information in a system. Hence, we argue that for the case of mobile IS the purpose of the system itself is not the only determinant for users' attitudes and behaviors but also the way and celerity the purpose is served and transferred to the users (Katz et al. 1991; Kroenung et al. 2016). To address and observe this theoretical gap, we propose a new determinant for an individual's attitude toward mobile IS with the concept of purpose transfer in addition to the basic utilitarian and hedonic purposes a system offers (Kroenung and Eckhardt 2015). Therefore, the research question within this examination is:

RQ: What is the role of purpose transfer for shaping an individual's attitude and preceding antecedents towards the use of an application in mobile IS?

To address the research gap and answer the research question, we conducted a survey among mobile IS users examining their beliefs, attitudes, and behaviors. In doing so, we contribute by extending our previous understanding of IS adoption in the context of mobile IS using by adding a new theoretical component in form of perceived purpose transfer helping us to better understand users and their attitudes and behaviors.

The remainder of the paper is structured as follows. The next section presents the theoretical background on purpose and purpose transfer, which is used to develop the hypotheses in our model. Following this, we provide an overview of the research methodology of our survey and the underlying dataset. The paper concludes with a description of all results and its discussion in the further sections.

Theoretical Background and Hypotheses Development

In this section the development of our research model will be provided. At first, we quickly introduce well known IS adoption research about different purposes of mobile IS use as well as their impact on an individual's attitude. Then, we provide the theoretical background of purpose transfer as an

important determinant for the attitude towards mobile IS and its preceding antecedents. Based on that, hypotheses for the different effects are derived.

The Role of Perceived System Purpose for System-related Attitudes

A system's perceived purpose as an influencing factor for an individual's attitude towards mobile IS reflects a motivating driver to use an IS and therewith shapes an individual's attitude in a positive way. The purpose itself is defined by an individual's expectations towards the use of a system (Kroenung et al. 2016). Prior research has modeled this purpose as direct antecedents for an individual's system use or as determinants shaping an individual's attitude towards a distinct system (Jeyaraj et al. 2006; Kroenung and Eckhardt 2015). Most prominent example for a purpose is the concept of perceived usefulness integrated and introduced in the Technology Acceptance Model (TAM) by Fred D. Davis (1989). The TAM (Davis 1989) and with it the concept of perceived usefulness represents the uttermost generic conceptualization of system use and a user's perceived purpose a system shall provide. Despite its generic nature the TAM also represents the most empirically proven research model in the field of IS adoption research emphasizing the importance of a perceived system purpose for subsequent attitudes and system-related user behaviors. A next step toward a deeper understanding of perceived system purposes and was then made by van der Heijden (2004), who provided a clear distinction in utilitarian and hedonic purposes. Within his work he regarded the nature of a technology regarding hedonism and utilitarianism a focal concept for what purpose users expect to be fulfilled from a system. Down to this day, his distinction in two major variables driving an individual's attitude towards a system – perceived usefulness and perceived enjoyment – still represents the theoretical core concept for the perception of utilitarism and hedonism that a system provides to the user. As it is the core of this work to examine the role of purpose transfer for an individual's attitude and the shaping of different purposes we integrate them in our research approach and hypothesize their effect as known from prior adoption research within the following subsections.

Perceived Usefulness as an Influencing Part of Purpose

Perceived usefulness is a term formed by Davis (1989) when introducing the TAM. Davis emphasizes the fact that fundamental variables that can be applied to general IS adoption research have been considered in particular, so the model provides a theoretical foundation on a highly generic level. As a result of that, the TAM is supposed to provide a basis for evaluating system-related effects such as the purpose a system offers to the user on subsequent attitudes and behaviors (Davis et al. 1989). Within TAM, Davis (1989) labels perceived usefulness as the utilitarian purpose that a system shall provide to the user (Davis 1989). Perceived usefulness as presented by Davis (1989) is defined as "*the degree to which a person believes that using a particular system would enhance his or her job performance*" (Davis 1989). The factor has been often used to elucidate IS acceptance and is known to be one of the best predictors of for an individual's attitude toward a new IS innovation (Jeyaraj et al. 2006; Kroenung and Eckhardt 2015). An individual's attitude using reflects an individual's positive or negative feeling about performing the specified behavior (Kroenung and Eckhardt 2015). The more the user expects the utilitarian purpose to be fulfilled by the system the better her or his feeling towards the system will be. Hence, we hypothesize for perceived usefulness representing the expected utilitarian purpose of a mobile IS:

H1: The more the user expects the utilitarian purpose of a mobile IS to be fulfilled, the better his or her attitude towards using mobile IS.

Perceived Enjoyment as an Influencing Part of Purpose

As mobile IS could provide different means, it seems natural to integrate in addition to utilitarian purpose also a component accounting for the perceived hedonic purpose of a system. Here, van der Heijden (2004) examines the impact of perceived enjoyment (PE) which has been suggested as an extinction by Davis et al. (1992) for basic IS adoption models and is defined as "*the extent to which the activity of using the computer is perceived to be enjoyable in its own right, apart from any performance consequences that may be anticipated*" (Davis et al. 1992). In this regard, van der Heijden (2004) conducts research concerning the difference of hedonic and utilitarian systems. Supported by a survey, he noticed a change of effects regarding the substantial factors of the TAM by Davis (1989). For years, many studies have shown the dominance of the perceived usefulness towards the perceived enjoyment as a driving belief using an IS (Davis et al. 1992; Igbaria et al. 1994; Igbaria et al. 1996) whereas several exceptions have occurred later on. These exceptions involve, among others, various Internet applications, such as online games or systems being used in the home environment,

so their use didn't seem to be mainly driven by perceived usefulness but perceived enjoyment (Van der Heijden 2004). Such systems can be classified as hedonic when combining the perceptions with user behavior literature that differentiates between hedonic and utilitarian products. Thus, a hedonic system chiefly aims at increasing the experienced fun a user has in contrast to a utilitarian system which aims at increasing user's work performance and efficiency (Van der Heijden 2004). Van der Heijden (2004) also notices that the nature of a system can be dependent on a certain environment. In his examination the distinction of home environments compared to workplace environments is accentuated. The TAM was originally developed from information and study results regarding information systems, which are supposed to improve productivity at the workplace. In contrast to that, it seems that many hedonic systems determine the usage of information systems in the home environment, as for instance computer games or instant messaging (Kraut et al. 1999; Venkatesh 1996; Venkatesh and Brown 2001). In consequence, it could be assumed that perceived enjoyment is a stronger driver for the use of information systems in home environments whereas perceived usefulness has a greater influence on intention in workplace environments. This might lead to the conjecture that distinguishing between hedonic and utilitarian systems is redundant due to attribution of information systems to either home or workplace environment. However, it can be observed that people make use of information technology to move their work out of their office environment into their home environment (Venkatesh and Vitalari 1992). This assessment, on the other side, indicates the need to differentiate between hedonic and utilitarian purposes that a system can offer.

With regard to mobile IS it can be noted that such systems can be used in both environments, as indicated by the word 'mobile'. Moreover, such systems can be utilized in environments beyond these two, so they actually are independent of place. This leads to the assumption that distinguishing between hedonic and utilitarian use concerning mobile IS is advisable, especially because of an uncertainty of an exact environment. For hedonic systems, Van der Heijden (2004) proves that perceived enjoyment is a stronger predictor of behavioral intention to use than perceived usefulness. Thus it can be supposed that perceived enjoyment is an important part of purpose, due to the fact mobile IS can be used as systems of either hedonic or utilitarian nature. Thus, we hypothesize that:

H2: The more the user expects the hedonic purpose of a mobile IS to be fulfilled, the better his or her attitude towards using mobile IS.

Purpose Transfer as Determinant for Attitude, and Perceived Purpose

Purpose transfer refers to the way and celerity a certain purpose is served and transferred to the users. As previously noted, mobile IS comprise a very important characteristic that distinguishes them from other information systems. They offer the opportunity of mobility, which makes them independent of time and place so users can apply such systems and receive information nearly anytime and anywhere. This seems to be a significant addition compared to other IS, such as desktop computers, thus it can be assumed that for mobile IS the transfer of the service to the user is important to individuals, which can also be indicated by increasing usage (Balasubramanien et al. 2002).

By considering marketing literature it is discernible that not alone the purpose itself matters and affects the satisfaction of using a service, but also factors, like the modality of how the service reaches the customer. It is shown that time can have a significant influence on consumers' satisfaction concerning a product or service, as well (e.g. Katz et al. 1991; Pruyn and Smidts 1998; Taylor 1994; Tom and Lucey 1997; Weinberg 2000). Several studies indicate that time, as a negative factor, such as the perceived waiting time, affects the overall contentment of consumers (Pruyn and Smidts 1998; Tom and Lucey 1997). Katz et al. (1991) emphasize the conjunction that customers do not only demand for quality but also for the speed of how they receive the service or product. The authors also presume that the speed of a service is becoming a more and more important attribute influencing the customer's satisfaction (Katz et al. 1991), which is also supported by research exposing the significance of time for service evaluation (Wee and Cheong 1991). An examination by Weinberg (2000) constitutes the situation of purpose transfer with regards to web usage. The behavior of web users is described as similar to the research mentioned before. If loading time of websites exceeds the maximum a user is willing to wait it might be possible that this user switches to another website serving the demanded purpose, as well. The factor waiting, and accordingly the attribute speed, is described as influencing to the extent, that users might even refuse visiting a certain website anymore (Weinberg 2000). Further, prior studies have demonstrated that users valued efficiency and availability as the primary advantages of mobile services (Hill and Roldan 2005) and that mobility associated with time-related needs encourages customers to adopt mobile technologies (Anckar and D'incau 2002).

These examples of research depict that the aspect of how a service or product reaches the user is of concern. As a result, it can be assumed, that if perceived purpose transfer can affect user satisfaction negatively, an improvement of that, as it is the case for mobile IS, transfer also can increase satisfaction and influence attitude positively. Due to this assumption, supported by marketing literature, which indicates the importance of the purpose transfer when focusing on the process of getting something, the following hypothesis can be derived:

H3: The faster the user perceives the transfer of the aimed purpose, the better his or her attitude towards using mobile IS.

In the context of mobile IS, the advantages of information or services for information gathering activities may be immediacy and convenience (Lin 2011), which let users access information or mobile IS services more easily than other services (e.g., scanning a QR code by using an application on the smartphone for context-specific information at a point of sale as opposed to a monthly newsletter). Hence, perceived purpose transfer is used to illustrate the advantages of time and place, service access, and use. Or to express it differently, perceived purpose transfer assures users to perceive the substantial advantages of services (Rogers, 1995). When users perceive these advantages, they understand the uniqueness of mobile IS and strongly perceive them to be useful (Mallat et al. 2009). Hence, we assume that perceived purpose transfer increases the perceived usefulness of the mobile IS. At the same time, users are also enabled to access and acquire entertainment by interacting with mobile IS while being underway (Hill and Roldan 2005). Similar to connecting with friends on social networking sites, users can interact with mobile IS anytime and anyplace (Mallat et al. 2009). Hence, we also expect that perceived purpose transfer can create user enjoyment while using mobile IS. Accordingly, we hypothesize:

H4: The faster the user perceives the transfer of the aimed purpose, the higher his or her perceived usefulness of the mobile IS.

H5: The faster the user perceives the transfer of the aimed purpose, the higher his or her perceived enjoyment of the mobile IS.

The underlying research model is based on the assumption that the purpose, as well as the purpose transfer determines the attitude towards the use of mobile IS directly and indirectly via perceived usefulness and enjoyment. The following figure demonstrates the dependency of each path and thus shows the proposed research model and the related hypotheses for the adoption of mobile IS (Figure 1). As the hypotheses for the relationships between attitude and intention as well as intention and actual usage were frequently shown in prior research, we won't hypothesize them in this work. Nevertheless we calculate all their paths to provide a consistent approach.

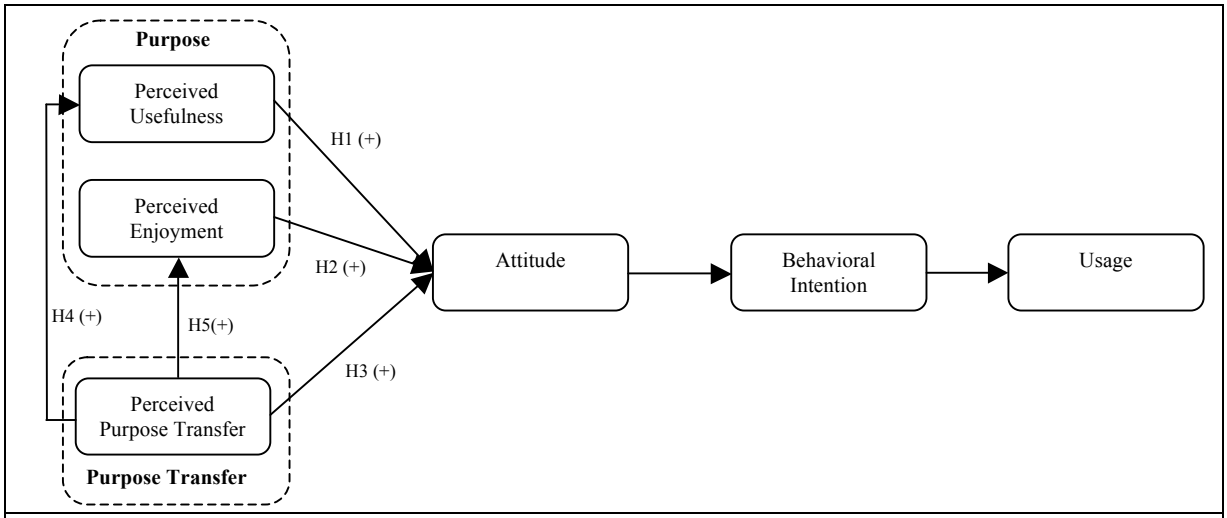


Figure 1. Research Model

Research Methodology

To empirically test the proposed hypotheses, a survey was planned and conducted. The invitation to answer the questions was distributed via a social network and additionally colleagues were asked to

distribute the survey via their networks to reach a larger subject group. This method seemed to be appropriate in order to achieve a large number of participants.

The survey's topic was the individual adoption of an application for scanning QR Codes as an example for mobile IS. Originally QR Codes were invented and used to accomplish logistic requirements offering various advantages compared to old code solutions (Dou and Li 2008). One advantage of QR codes is the broad range of information a QR Code can record making it possible to save an URL or other long texts (Knuchel et al. 2010). This fact in mind and realizing the added value of having an image scanner app to read QR Codes, the Japanese company J-Phone launched a new mobile phone in 2002 that was able to read QR Codes. With this step, QR Codes seemed to be integrated in Japan, which is suggested by usage in mobile marketing increasing by ten times since 2003 (Dou and Li 2008). QR Codes are often used to supply consumers with additional information about a distinct product. Furthermore, advertisers use QR Codes to offer more than just simple information, but something more entertaining like a video, a sweepstake or recipes to learn cooking (Dou and Li 2008). In most cases QR Codes include a link to a certain website. This seems to make things easier for users, due to the fact that scanning and pressing the link is more comfortable than entering an entire web address (Dou and Li 2008). To sum it up, whereas QR Codes scanner applications as an example of mobile IS were originally invented to fulfill a job more efficiently by increasing recording performance, marketers nowadays use QR codes in a broad range of marketing strategies targeting on individuals' enjoyment and thus making it less clear what factors drive users to scan such codes via an application.

The constructs used to test the proposed research model are based on existing literature and are presented in the following Table 1.

Construct	Items	Source
Usage	I often use QR Codes.	Kankanhalli et al. (2005)
	I regularly make use of QR Codes.	
Behavioral Intention	I intend to use QR regularly in the future.	Wixom and Todd (2005)
	I intend to use QR Codes more often over the next time.	
	I plan to increase my use of QR Codes in the future.	
Attitude	Using QR Codes is generally pleasing.	Wixom and Todd (2005)
	Overall, using QR Codes is a pleasant experience.	
	My attitude toward using QR Codes is generally favorable.	
Perceived Usefulness	Using QR Codes enhances my effectiveness on surfing the Internet with a phone.	Davis (1989)
	Using QR Codes increases my utility.	
	Using QR Codes makes it easier to surf the web on the way.	
Perceived Enjoyment	I think QR Codes are exciting.	Van der Heijden (2004); Wetzels et al. (2009)
	I think QR Codes are entertaining.	
	I think QR Codes are fun.	
Perceived Purpose Transfer	By using QR Codes, I can receive information in a timely manner.	self-developed; based on Wixom and Todd (2005)
	QR Codes help to save time.	
	QR Codes help to receive information quickly.	

Table 1. Operationalization of Constructs

228 people answered the survey completely. However, to control for participants to have sufficient knowledge about QR codes, non-users were excluded from our analysis as they were deemed to be unfit to elaborate on our constructs. This resulted in our final sample of 97 users. An overview of the demographic data of the participants can be seen below (Table 2).

Gender		Age		Career status			
Male	51.6%	< 21 years	17.8%	Apprentice	8.7%	Manager	4.6%
Female	48.4%	21 – 25 years	53.0%	Student	47.4%	Others	9.6%
		26 – 30 years	16.9%	Worker	20.1%		
		31 – 35 years	4.1%	Young Professional	8.2%		
		> 35 years	8.2%	Professional	1.4%		

Table 2. Demographic Information of the Participants

Out of these 97, 51.6% were women and 48.4% men. Most of the participants were 21-25 (53%), 15-20 (17.4%) and 26-30 (16.9%) years old. Students (47.4%) and workers (20.1%) dominate the characteristic of career status, which suites the occurrence of the different age categorizations.

Results

In order to analyze the proposed research model and to validate the proposed hypotheses, the model has been transferred into a structural equation model (Chin 1998). For this examination the software SmartPLS (Ringle et al. 2005) was used to determine path influences. The suggested ratio of sample size to number of free parameters of 10:1, in order to reach trustworthiness, is fulfilled (Bentler 1985).

Measurement Model

When building the research model, constructs that have already been used in prior examination, were considered. Each construct was measured with reflective indicators whereas adaptations concerning mobile IS or rather QR Codes have been conducted (Davis 1989; Kankanhalli et al. 2005; Van der Heijden, 2004; Wetzels et al. 2009; Wixom and Todd, 2005). In the following, content validity, indicator reliability, construct reliability and discriminant validity will be validated (Bagozzi 1979).

With regard to content validity, the questions asked in the survey were built on constructs that have been proven and confirmed as determined regarding measuring influence. The basis of TAM was adapted to the proposed model (Davis 1989; Kankanhalli et al. 2005; Wixom and Todd 2005), which includes perceived usefulness, attitude towards usage, behavioral intention and final usage. The suggested perceived enjoyment by Davis et al. (1992), which has been confirmed by Van der Heijden (2004), was added as well (Wetzels et al. 2009). The concept of purpose transfer is self-developed, but it is based on the construct of 'Timeliness', used by Wixom and Todd (2005).

Table 3 provides a detailed overview of the measurement model. Besides loadings, average variance extracted (AVE), Cronbach's alpha, composite reliability (CR), the square root of the corresponding AVE is provided, which can be found in each line as the last number. Below this value the different correlations are listed in order to verify discriminant validity.

Items		**Loadings**	**Cronbach's α**	**CR**	**AVE**	**Latent Variable Correlations**					
						U	BI	ATT	PU	PE	PPT
U	U1	0.978	0.951	0.976	0.954	**0.977**					
	U2	0.975									
BI	BI1	0.909	0.908	0.942	0.843	0.592	**0.918**				
	BI2	0.930									
	BI3	0.915									
ATT	ATT1	0.945	0.894	0.934	0.826	0.573	0.693	**0.909**			
	ATT2	0.910									
	ATT3	0.870									
PU	PU1	0.886	0.821	0.893	0.736	0.495	0.575	0.640	**0.858**		
	PU2	0.839									
	PU3	0.848									
PE	PE1	0.926	0.913	0.944	0.849	0.293	0.577	0.585	0.425	**0.921**	
	PE2	0.913									
	PE3	0.925									
PPT	PPT1	0.876	0.881	0.927	0.808	0.421	0.495	0.719	0.757	0.450	**0.899**
	PPT2	0.898									
	PPT3	0.922									

Note: U = Usage; BI = Behavioral intention; ATT = Attitude; PU = Perceived usefulness; PE = Perceived enjoyment; PPT = Perceived purpose transfer

Table 3. Results of Measurement Model Analysis

To assess indicator reliability the loadings of the measures with their corresponding constructs need to be examined by considering the proportion of the indicators' variance. In research, indicators with loadings greater than 0.7 are commonly regarded as acceptable, due to the fact it could be assumed that more than 50 per cent of the variance in the observed variable is explained by the indicators used in the examination (Carmines and Zeller 2008). In general, it is recommended to remove indicators with loadings of less than 0.4 to ensure indicator reliability (Hulland 1999). According to these criteria, all suggested indicators were accepted (Table 3). The indicators' loadings of usage and behavioral intention all come to over 0.9. The indicator loadings of the construct attitude also reach the border of 0.9 except of one loading, which still amounts to over 0.8. With regard to the constructs of perceived usefulness, perceived enjoyment and perceived purpose transfer, all loadings come to over 0.8

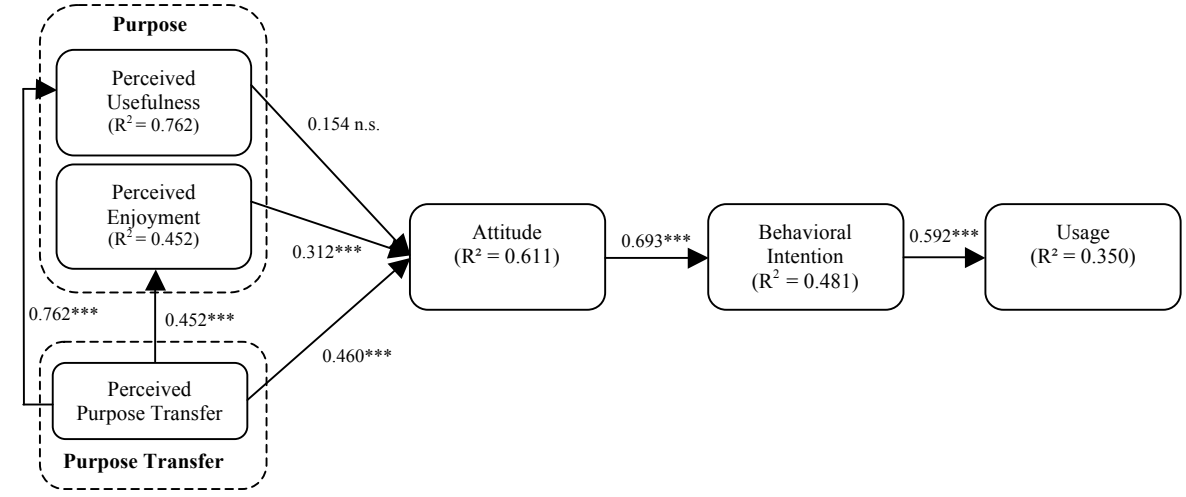
whereas some even reach over 0.9. To assess the significance level of each loading, the bootstrap method with 500 samples was applied (Henseler et al. 2009). In consequence, the significance level of all loadings is highly significant at $p \leq 0.001$.

In order to assess construct reliability, Composite Reliability (CR) and Average Variance Extracted (AVE), which declare how good the latent variable is measured by its indicators, need to be analyzed (Bagozzi and Yi 1988, and Fornell and Larcker 1981). Researchers recommend CR values over 0.6 to ensure construct reliability (Bagozzi and Yi 1988). If a construct shall be also determined as reliable, the AVE should contain values over 0.5 so the variance due to measurement error is smaller than the variance captured by the construct. Almost all values of CR amount to over 0.9, apart from the construct perceived usefulness that still comes to 0.89. The same pattern is notable by considering the values of AVE. Perceived usefulness reaches a value of 0.74, which still declares reliability, whereas the other values all fulfill the thresholds of 0.8 and 0.9 (Table 3). So all in all, according to CR and AVE, the entire construct level can be characterized as reliable.

Testing discriminant validity is a procedure helping to substantiate the different interpretations concerning the test findings. Due to discriminant validity it can be indicated to what extent the measurements of a certain construct distinguish themselves from measures of other constructs in the used model, so it can be ensured, that theoretically they are not equal (Campbell and Fiske 1959). This condition is given when the measure of a certain AVE is greater than the variance shared between the construct and other constructs. To assess this, the square root of the AVE can be compared to the construct correlations (Fornell and Larcker 1981; Hulland 1999). In this examination all square roots of the different AVE values are greater than the corresponding construct correlations so all constructs used in this model differ significantly (Table 3). Finally, we find no multicollinearity issues of the inner model following the rule of thumb that the variance inflation factor (VIF) should be below 5.

Structural Model

This section examines and evaluates the structural model, which includes the consideration of the coefficient of determination (R2) and the significance level of each path coefficient (Chin 1998). The results of the model estimation are presented in Figure 2.



Note: * p < 0.05, ** p < 0.01, ***, p < 0.001, n.s. = not significant

Figure 2. PLS Results of Model Testing

As the basis model of TAM suggests that attitude determines behavioral intention, which in turn affects usage, the results of this study support this conviction as expected. 35.0 per cent of the variance of usage is explained by behavioral intention and attitude achieves 48.1 per cent of the variance of behavioral intention. Even though these values only indicate an average explanation, a weak or even no influence can be eliminated (Chin 1998). Further, the three dimensions perceived usefulness, perceived enjoyment and perceived purpose transfer explain 61.4 per cent of the variance of the attitude towards using mobile IS. These values are above average, which can be noted when considering the threshold of 0.67 (R2) to a substantial explanation.

To test the hypotheses a bootstrapping resampling procedure (500 samples) was used to determine the significance of the paths within the structural model. The relationship between perceived usefulness and attitude is directionally consistent but not significant (ß = 0.154, n.s.). Hence H1 is not supported. Consistent with H2 and H3, perceived enjoyment (ß = 0.312, p < 0.001) and perceived purpose transfer (0.460 = X, p < 0.001) each has a significant effect on attitude. Finally, consistent with H4 and H5, perceived purpose transfer has a significant effect on perceived usefulness (ß = 0.762, p < 0.001) and perceived enjoyment (ß = 0.452, p < 0.001). Conclusively, hypotheses 2, 3, 4 and 5 can be confirmed. Only hypothesis 1, the influence of perceived usefulness on attitude, had to be rejected.

The effect size measures the effect of an exogenous latent variable on an endogenous latent variable and can be obtained by Cohen's f^2 (Chin 1998; Cohen 1988). The change in the R^2 of the endogenous latent variable is calculated by estimating the structural model twice for when an exogenous variable is used and when it is not used. Values of 0.02 indicate that the predictor variable has a "weak" effect size on the endogenous variable, whereas values of 0.15 and 0.35 indicate a "moderate" and "large" effect size, respectively (Chin 1998; Cohen 1988). Our analysis indicates that the effect size of perceived purpose transfer on attitude is moderate (f^2 = 0.217, p < 0.1). However the effect sizes of perceived enjoyment on attitude (f^2 = 0.195) and perceived usefulness on attitude (f^2 = 0.025) are not significant.

To test a potential mediating effect of perceived usefulness and perceived enjoyment on the relationship between perceived purpose transfer and attitude, the analysis suggested by Baron and Kenny (1986) was conducted. The results of the mediation analysis are summarized in Table 4. For supporting signification mediation according to Baron and Kenny (1986) the following four conditions need to be fulfilled. First, the independent variable (IV) should significantly influence the dependent variable (DV) in the absence of the mediator (Path A in Table 4). This conditions is successfully met for the IV perceived purpose transfer (ß = 0.723, p<0.01). Second, the mediator should significantly influence the dependent variable (Path B). This condition is likewise fulfilled for the mediating variables of perceived usefulness (ß = 0.215, p<0.01) and perceived enjoyment (ß = 0.327, p<0.01). Third, the IV must significantly account for variations in the mediator (Path C). This condition is satisfied for the mediating variables of perceived usefulness (ß = 0.763, p<0.01) and perceived enjoyment (ß = 0.453, p<0.01). Finally, when adding the mediator (Path D), the previous influence between the independent and dependent variables (as in Path A) should become non-significant for full mediation or smaller for partial mediation. When controlling for the mediators perceived usefulness and perceived enjoyment, the influence of perceived purpose transfer on attitude becomes smaller but is still significant, which suggests partial mediation in both cases. To further test the significance of the mediation effect the Sobel Test is applied (Sobel 1982). The results on the Sobel-Test show that perceived usefulness and perceived enjoyment both partially mediate the relationship between perceived purpose transfer and attitude significantly.

	Path A	**Path B**	**Path C**	**Path D**	**Sobel-Test: Z**	**Mediation**
PPT→PU→ATT	0.723***	0.215*	0.763***	0.560***	2.067*	Partial
PPT→PE→ATT	0.723***	0.327***	0.453***	0.572***	3.402***	Partial
Note: PPT = Perceived purpose transfer; PU = Perceived usefulness; PE = Perceived enjoyment; ATT = Attitude; Path A: IV -> DV without Mediator; Path B: Mediator -> DV; Path C: IV -> Mediator; Path D: IV -> DV with Mediator; * p < 0.05, ** p < 0.01, ***, p < 0.001.						

Table 4. Mediation Analysis

Discussion

This study on adoption behavior of mobile IS has yielded several important findings. First, on a theoretical basis it has been shown that the topic of IS adoption is not only related to the aspect of a system's purpose but also the aspect of purpose transfer, due to the development of mobile IS and the increasing importance of independence in terms of time and location. Nowadays, users might care about how a certain purpose is solved or how a system fulfills a certain task. Beyond this theoretical analysis these conjectures have been proven empirically so the survey substantiates the proposition, that, apart from purpose, purpose transfer plays a significant role in the individual adoption of mobile IS. The survey reveals that the path coefficient for purpose transfer for the effect on attitude towards using mobile IS is greater for the relationship between attitude and the purpose itself. Even though the difference seems to be small, it is noticeable, that a possible change in adoption process of users took place so purpose transfer is at least as important as the purpose that is fulfilled by the mobile IS. This change in thinking might be the result of complementing the aspect of mobility to prior IS so the way of accessing such systems changed entirely. In addition, perceived purpose transfer enhances

users' ability to perceive usefulness and enjoyment advantages related to mobile IS. Thus, perceived purpose transfer not only directly affects attitude and but also indirectly affects that attitude via perceived usefulness and perceived enjoyment. An implication, which can be made, is the fact, that purpose transfer is not restricted to the field of marketing and psychology anymore, but also relevant to IS adoption behavior as well. Moreover, the survey's results demonstrate the importance of distinguishing between different kinds of purposes. The separation regarding the utilitarian or hedonic nature of a system, suggested by Van der Heijden (2004), might be really important for adopting a strategy in order to implement a system successfully. As observed, the use of a mobile IS might solely be driven by a hedonic purpose so the omnipresent utilitarian purpose alone, measured by perceived usefulness, is not helpful to examine the acceptance and adoption behavior for certain IS.

Our results also offer several practical implications. First, this study finds that perceived purpose transfer is a key variable in influencing attitude and continued usage intention in mobile IS. Thus, mobile IS providers and designers need to increase users' perceptions of the value of how the purpose is transferred to the user. For example, to expand their customer base, mobile IS providers and designers can emphasize the value of mobile IS by offering, for instance, real-time information and specific location-related events. Thus, mobile IS providers, designers and marketing personnel may be able to provide more favorable incentives and a higher value than competitors (e.g. through mobility and timeliness), encouraging consumers to use mobile IS. Second the evidence reveals that perceived enjoyment is significantly associated with attitude and therefore with intention. This result is consistent with Van der Heijden (2004), implying that current users view mobile IS more as a hedonic system. This impact of perceived enjoyment is an intrinsic motivation for users to use or accept technology (Venkatesh and Brown 2001). If users reject a utilitarian system, hedonic features may invoke the other motivation to achieve user acceptance (Van der Heijden 2004). Thus, mobile IS providers need to develop more entertaining aspects of mobile IS that can increase the hedonic motivation to use mobile IS.

Limitations and further research

This study is also subject to limitations that point to further research opportunities. First, the participants of the survey belong to only one cultural environment and given potential cultural differences, it is possible that users in other countries might have different perceptions and reactions towards mobile IS. Future research should validate the model in distinctly different national cultures. Second, other factors such as age and gender could have influenced the relationships in our model. Yen and Wu (2016), for instance, show that gender moderates the relationship between TAM variables and usage intention in the context of mobile financial services. Demographic differences could be of special interest for mobile IS providers and marketing personnel, which may need to address mobile IS users as a non-homogenous group. Thus, future research could examine moderating variables related to demographics that may influence predictors of mobile IS use adoption. In operationalizing perceived purpose transfer we mainly focus on temporal aspects, since immediacy is among the most important elements of mobility (Lin 2011). However, future studies could focus on potential additional elements, such as convenience and expedience. Fourth, we use only one context of mobile IS use, namely using a QR Code scanner application as a representative for mobile IS. Even though, just basic considerations on mobile IS adoption have been developed, further research could consider several points in order to improve and expand our understanding. One major aspect could be the testing of the proposed research model with regard to other mobile IS or even general IS innovations. There might exist technologies whose acceptance or attitude towards using can be explained by the suggested basis dimensions purpose and purpose transfer. Especially the influence of purpose transfer could play an important role due to mobility and the independence of place, which are very important parts of mostly any new technology used by individuals. This research is supposed to encourage researchers to examine this topic and to consider this contribution. It might also be interesting to know, if the dimension of purpose transfer can be extended by other relevant constructs to increase explanation. Moreover, the aspect of long-term adoption and the differentiation of non-user should be considered to also increase the understanding of the difference between actual users and non-users. These findings might indicate implications that in turn help to enhance general usage of mobile IS.

References

Anckar, B. and D'incau, D. 2002. "Value creation in mobile commerce: Findings from a consumer survey." *Journal of Information Technology Theory and Application* (4:19), p. 43-64.

Bagozzi, R. P. 1979. "The Role of Measurement in Theory Construction and Hypothesis Testing: Toward a Holistic Model," in *Conceptual and Theoretical Developments in Marketing*, O. C. Ferrell, S. W. Brown, and C. W. Lamb (eds.), Chicago, Ill.: American Marketing Assoc., pp. 15–32.

Bagozzi, R. P. and Yi, Y. 1988. "On the Evaluation of Structural Equation Model," *Journal of the Academy of Marketing Science* (16:1), pp. 74-94.

Balasubramanien, S., Peterson, R. A. and Jarvenpaa, S. L. 2002. "Exploring the Implications of M-Commerce for Markets and Marketing," *Journal of the Academy of Marketing Science* (30:4), pp. 348-361.

Baron, R. M. and Kenny, D. A. 1986. "The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations," *Journal of personality and social psychology*, 51(6), 1173.

Bentler, P. M. 1985. *Theory of Implementation of EQS: A Structural Equations Program*, Los Angeles: BMDP Statistical Software.

Campbell, D. T. and Fiske, D. W. 1959. "Convergent and Discriminant Validation by the Multitrait-Multimethod Matrix," *Psychological Bulletin* (56:2), pp. 81-105.

Carmines, E. G. and Zeller, R. A. 2008. *Reliability and Validity Assessment*, Newbury Park, California.

Chin, W. W. 1998. "The Partial Least Squares Approach to Structural Equation Modeling," in *Modern Methods for Business Research*, G. A. Marcoulides (ed.), Mahwah, NJ, pp. 295-336.

Cohen, J. 1988. *Statistical Power Analysis for the Behavioral Sciences*, 2nd Edition. Hillsdale, N.J.: Lawrence Erlbaum.

Davis, F. D. 1989. "Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology," *MIS Quarterly* (13:3), pp. 319-340.

Davis, F. D., Bagozzi, R. P. and Warshaw, P. R. 1992. "Extrinsic and Intrinsic Motivation to Use Computers in the Workplace," *Journal of Applied Social Psychology* (22:14), pp. 1111-1132.

Dery, K., Kolb, D. and MacCormick, J. 2014. "Working with connective flow: how smartphone use is evolving in practice," *European Journal of Information Systems* (23:5), pp. 558-570.

Dou, X. and Li, H. 2008. "Creative Use of QR Codes in Consumer Communication," *International Journal of Mobile Marketing* (3:2), pp. 61-67.

Durst, S. and Runar Edvardsson, I. 2012. "Knowledge management in SMEs: a literature review," *Journal of Knowledge Management* (16:6), pp. 879-903.

Fornell, C. and Larcker, D. F. 1981. "Evaluating Structural Equation Models with Unobservable Variables and Measurement Error", *Journal of Marketing Research* (18:1), pp. 39-50.

Henseler, J., Ringle, C. M., Sinkovics, R. R. 2009. "The Use of Partial Least Squares Path Modeling in International Marketing," *Advances in International Marketing* (20), pp. 277-319.

Hill, T. R., and Roldan, M. 2005. "Toward third generation threaded discussions for mobile learning: Opportunities and challenges for ubiquitous collaborative environments." *Information Systems Frontiers*, (7:1), pp. 55-70.

Hulland, J. S. 1999. "Use of Partial Least Squares (PLS) in Strategic Management Research: A Review of Four Recent Studies," *Strategic Management Journal* (20:2), pp. 195–204.

Igbaria, M., Schiffman, S. J. and Wieckowski, T. J. 1994. "The Respective Roles of Perceived Usefulness and Perceived Fun in the Acceptance of Microcomputer Technology," *Behaviour & Information Technology* (13:6), pp. 349-361.

Igbaria, M., Parasuraman, S. and Baroudi, J. J. 1996. "A Motivational Model of Microcomputer Usage. Journal of Management Information Systems," (13:1), pp. 127-143.

Jeyaraj, A., Rottman, J. W. and Lacity, M. C. 2006. "A Review of the Predictors, Linkages, and Biases in IT Innovation Adoption Research," *Journal of Information Technology* (21:1), pp. 1-23.

Kankanhalli, A., Tan, B. C. Y. and Wei, K. K. 2005. "Contributing Knowledge to Electronic Knowledge Repositories: An Empirical Investigation," *MIS Quarterly* (29:1), pp. 113-143.

Katz, K. L., Larson, B. M. and Larson, R. C. 1991. "Prescription for the Waiting-in-Line Blues: Entertain, Enlighten, and Engage," *Sloan Management Review* (32:2), pp. 44-53.

Knuchel, T., Kuntner, T., Pataki, E. C. and Back, A. 2011. "2D Codes. Technologie und Anwendungsbereiche," *Wirtschaftsinformatik* (1), pp. 49-52.

Kraut, R., Mukhopadhyay, T., Szczypula, J., Kiesler, S. and Scherlis, B. 1999. "Information and Communication: Alternative Uses of the Internet in Households," *Information System Research* (10:4), pp. 287-303.

Kroenung, J., and Eckhardt, A. 2015. "The attitude cube - A three-dimensional model of situational factors in IS adoption and their impact on the attitude-behavior relationship," *Information & Management* (52), pp. 611-627.

Kroenung, J., Eckhardt, A., and Kuhlenkasper, T. 2016. "Conflicting behavioral paradigms and predicting IS adoption and non-adoption - The importance of group-based analysis," *Computers in Human Behavior* (67), pp. 10-22.

Lin, H. 2011. "An empirical investigation of mobile banking adoption: The effect of innovation attributes and knowledge-based trust," *International Journal of Information Management* (31:3), pp. 252-260.

Lin, H. H., and Wang, Y. S. (2006). "An examination of the determinants of customer loyalty in mobile commerce contexts. *" Information & Management*, 43(3), 271-282.

Mallat, N., Rossi, M., Tuunainen, V. K., and Öörni, A. 2009. "The impact of use context on mobile services acceptance: The case of mobile ticketing," *Information & Management* (46:3), pp. 190-195.

MacCormick, J. S., Dery, K. and Kolb D. G. 2012. "Engaged or just connected? Smartphones and employee engagement," *Organizational Dynamics* (41:3), pp. 194-201.

Middleton, C., Scheepers, R., and Tuunainen, V. K. 2014. "When mobile is the norm: researching mobile information systems and mobility as post-adoption phenomena," *European Journal of Information Systems (23:5)*, pp. 503-512.

Pruyn, A., and Smidts, A. 1998. "Effects of waiting on the satisfaction with the service: Beyond objective time measures," *International journal of research in marketing* (15:4), pp. 321-334.

Ringle, C. M., Wende, S. and Will, A. 2005. "SmartPLS. 2.0 (beta)," University of Hamburg. Available from: http://www.smartpls.de.

Rogers, E. M. 1995. Diffusion of innovation (4th ed.). New York, NY: Free Press.

Sobel, M. E. 1982. "Asymptotic confidence intervals for indirect effects in structural equation models," *Sociological methodology* 13, 290-312.

Taylor, S. 1994. "Waiting for Service: The Relationship between Delays and Evaluations of Service," *Journal of Marketing* (58:2), pp. 56-69.

The Statista Portal 2016. "Number of smartphone users worldwide from 2014 to 2020 (in millions)," Retrieved 2/16/2017 from http://www.statista.com/statistics/330695/number-of-martphone-users-worldwide/(accessed 02/01/2017)

Tom, G. and Lucey, S. 1997. "A Field Study Investigating the Effect of Waiting Time on Customer Satisfaction," *The Journal of Psychology* (131:6), pp. 655-660.

Van der Heijden, H. 2004. "User Acceptance of Hedonic Information Systems," *MIS Quarterly* (28:4), pp. 695-704.

Venkatesh, A. 1996. "Computers and other Interactive Technologies for the Home," *Communications of the ACM* (39:12), pp. 47-57.

Venkatesh, A. and Vitalari, N. P. 1992. "An Emerging Distributed Work Arrangement: An Investigation of Computer-Based Supplemental Work at Home," *Management Science* (38:12), pp. 1687-1706.

Venkatesh, V. and Brown, S. A. 2001. "A Longitudinal Investigation of Personal Computers in Homes: Adoption Determinants and Emerging Challenges," *MIS Quarterly* (25:1), pp. 71-102.

Venkatesh, V., Morris, M. G., Davis, G. B. and Davis, F. D. 2003. "User Acceptance of Information Technology: Toward a Unified View," *MIS Quarterly* (27:3), pp. 425-478.

Venkatraman, M. P. and MacInnis, D. J. 1985. "The Epistemic and Sensory Exploratory Behaviour of Hedonic and Cognitive Consumers," *Advances in Consumer Research* (12), pp. 102-107.

Von Krogh, G. 2012. "How does social software change knowledge management? Toward a strategic research agenda," *The Journal of Strategic Information Systems* (21:2), pp. 154-164.

Watson, R. T., Pitt, L. F., Berthon, P. and Zinkhan, G. M. 2002. "U-Commerce: Expanding the Universe of Marketing," *Journal of the Acadeny of Marketing Science* (30:4), pp. 333-347.

Wee, C. H. and Cheong, C. 1991. "Determinants of Consumer Satisfaction/Dissatisfaction towards Dispute Settlements in Singapore," *European Journal of Marketing* (25:10), pp. 6-16.

Weinberg, B. D. 2000. "Don't Keep Your Internet Customers Waiting Too Long at the (Virtual) Front Door," *Journal of Interactive Marketing* (14:1), pp. 30-39.

Wetzels, M., Odekerken-Schröder, G. and Van Oppen, C. 2009. "Using PLS Path Modeling for Assessing Hierarchical Construct Models: Guidelines and Empirical Illustration," *MIS Quarterly* (33:1), pp. 177-195.

Wixom, B. H. and Todd, P. A. 2005. "A Theoretical Integration of User Satisfaction and Technology Acceptance," *Information System Research* (16:1), pp. 85-102.

Yen, Y. S., and Wu, F. S. 2016. "Predicting the adoption of mobile financial services: The impacts of perceived mobility and personal habit," *Computers in Human Behavior* (65), pp. 31-42.