Investigating Technology Acceptance of Mobile Payment in Germany and the USA

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Abstract

In today`s mobile world there is a high potential for M(obile)-payment services, but the mere existence of such services does not mean market readiness. Added values of M-payment are necessary to attract new users. The aim of this work is to investigate whether M-payment is or can be accepted by the consumers. We will determine the technology acceptance of consumers, face to face with the M-payment for Germany and the USA. For this purpose, we will carry out a technology acceptance analysis using a structural equation modeling technique. The constructs of the research model arise from the findings of an explorative study and a literature review. The results of an extended technology acceptance model (TAM) based evaluation shows, that user acceptance of M-payment, especially the influence of the constructs, perceived ease of use and willingness-to-pay differ to the intention to use.

1   Introduction

Mobility has become an essential part not only in our everyday life, but also in the global economic market. Being available and able to operate at "anytime" and "anywhere" is a feature of nowadays` world [31]. Ubiquity and flexibility are just a few keywords distinguishing

the economy. Out of this, the adoption of mobile information and communication technologies arise with an increasing rate, allowing the users to bridge areal distances and their stationary dependency. M-payment is one of these future business models allowing consumers to do designate electronic payments via their mobile devices [22]. Money and the way to pay have always been playing an important role in the history of mankind. In today's society where people are under time pressure mobile payment has the possibility to make life easier by making payment more convenience. If implemented correctly M-payment could make long queues at checkouts or ticket automats a relic of the past and could also make payments more convenient in general, such as, to transferring money to one's family or friends, M-payment enables new opportunities in everyday life. The possibilities and opportunities are huge and M-payment has a realistic chance to become the future standard payment method. So far M-payment has been only successful in certain countries. Hence, the success or failure of a mobile service, such as M-payment, depends on the acceptance of the consumer [27]. Without the consumer's acceptance innovations will fail, as the past has already shown. Increasing acceptance of M-payment methods have been experienced in the recent years, but in the US, the potential of M-payment is still largely unexplored.

Therefore, the fundamental question that motivated this study is which factors determine the consumers' acceptance of M-payment and which differences occur between Germany and the USA. For this purpose, we carry out an extended technology acceptance analysis. Structural equation modeling (SEM) techniques were accomplished for measurement validation and model testing by using SmartPLS (Partial Least Squares). The constructs of the research model we use, arise from the findings of an explorative study and a literature review. This study not only proposes and validates a theoretical model for technology acceptance of M-payment, but also gives the answer to how M-payment technologies can add an additional value for the consumer. This study concentrates on what desires and preferences the consumers have and which aspects need to be improved to increase the acceptance. The results and the indicators will be compiled to finally derive recommendations for action.

2   Literature Review

There are a number of different definitions of M-payment in literature. The most common definition is that "M-payment is a point-of-sale payment made through a mobile device, such as a cellular telephone, a smartphone or a personal digital assistant (PDA)" [14]. Summarized M-payment can be understood as the type of payment process, in which the user initiates, authorizes or realizes the payment with the use of mobile communications technologies via mobile device. Hence, M-payment can be understood as a subset of mobile commerce, since it plays a major role for the handling of mobile commerce, while mobile commerce is not only limited to M-payment. Furthermore M-payment can be demarcated from mobile billing, since mobile billing is limited to the billing of telecommunications services through a mobile operator [36]. M-payment is not only limited to mobile web purchases. M-payment can also include transactions to the physical world such as the interaction with vending machines or to other persons. The M-payment vision is to replace the wallet by the mobile phone, including all important information which is carried in a wallet, such as the ID card, driving license etc. [3].

M-payment offers users a variety of payment options. In the literature the most common classification are, the time, when the payment occurs, the amount of the payment and the method for the billing process [34]. Nowadays, there exist many examples of successful M-payment applications such as the mobile content market which has developed into a billion dollar business [29], PayPal Mobile [40] or use of M-payments in public transportation [26]. Technically the M-payment can occur via text message, GPRS, UTMS, WAP, as well as radio waves with a short distance range, such as NFC, RFID etc. [2]. Most existing studies on M-payment consider the technical aspects of payment processes [20],[6] ,but this study aims to provide theoretical contribution to the sector of M-payment by identifying some of the factors that determine consumer acceptance of M-payment. Consumer adoption behavior is one of the key issues and we need to ask why new mobile payments will or will not be used by their intended users [15]. Previous studies in the sector of consumer acceptance and adoption have focused on Costs [23],[28],[19], Convenience [4],[8], Security [41],[12] Trust [28],[8], Ease of use and Usefulness [37],[41],[12],[19]. Most of the studies come to the result that M-payment applications should be convenient, easy to use and even cause little or no additional costs to consumers. Therefore, in our study we also examine the willingness to pay for M-payment applications and the general attitude towards new technologies to identify the most important factors influencing the consumer acceptance of M-payment. In recent years, studies on the acceptance of M-payment in Germany [33] and the USA [12],[4] have already been carried out. The advantage of this present study is that it also compares the two countries and determines important differences and factors influencing the technology acceptance of M-payment.

3   Research Method

The TAM is an IS theory that models how users accept and use a technology. The TAM was originally introduced and developed by Davis [9] and further developed by a variety of authors. Two critical success factors (CSF) determine user acceptance:

- Perceived usefulness (PU) is defined as the prospective user's subjective probability that using a specific application system will increase his or her job performance within an organizational context.

- Perceived ease-of-use (PEOU) refers to the degree to which the prospective user expects the target system to be free of effort.

In an empirical study, Davis et al. [10] determined that the frequency and intensity of use of computer technology can be reasonably well predicted from a person's intentions. PU is a major determinant of people's intention to use computer technology (INTUSE) and PEOU is a significant secondary determinant of their intention to use. Beyond PU and PEOU, the user's attitude towards using technology influences INTUSE, which is then influenced by PU and PEOU. The explanatory power of TAM is just as good as without regarding the originally included construct of 'attitude towards using' [38].Therefore, we propose the following hypotheses:

- H_1: PEOU will have a positive effect on PU.

- H_2: PEOU will have a positive effect on INTUSE.

- H_3: PU will have a positive effect on INTUSE.

To identify further important CSF's influencing the technology acceptance of M-payment, we interviewed eleven experts from the field of M-payment. Sampling includes respondents from different countries and different M-payment sectors such as M-payment providers, financial institutions, mobile network providers, professors and experts. The explorative interviews were anonymous and conducted on a qualitative basis. The respondents made statements to their experiences and expectations with M-payment. Thereby, all results were summarized in uniform statements and have been evaluated. If there were questions the experts could not answer with certainty, they were asked to give an estimate. Next to the explorative survey we gathered the most important and most consistent positions from the literature to adjust them with the results of the explorative survey, which leads to the additional constructs "Trust" (TR), "Security" (SEC), "New Technologies" (NEW_TECH), "Willingness to Pay" (WTP). Based on these constructs we conducted a quantitative study, using a technology acceptance analysis for Germany and the USA, to investigate the consumer acceptance of M-payment. As a result of an online survey we received 128 respondents from Germany and 64 respondents from the USA.

In addition to PEOU and PU, the first construct which will be considered in the research model is TR. This construct is therefore so important because the mobile internet and the M-payment is a very recent phenomenon and it is therefore even more important to identify the determinants influencing the trust of consumers for M-payment system and to providers [24]. Innovations are mostly associated with trust, uncertainty and risk. Trust is the key for a successful and long relationship with consumers. Trust takes a long time to build, can be easily destroyed, and is hard to regain. More trust in the M-payment system will also increase the intention to use M-payment as well.

- H_4: TR will have a positive effect on INTUSE.

Trust in the M-payment systems or provider depends on indicators such as, anonymity, security, reputation of the mobile payment provider, reliability and the amount of control the user has regarding M-payment [41]. Since trust and security are in interaction with each other, the next logical construct we will consider in our research model is SEC. Security concerns are the extent to which the prospective user is concerned about the following security aspects relevant to M-payment [2]. A secure M-payment transaction must secure the following four elements: 1) *Authentication*, data exchanged during the transaction will be restricted to legitimate users only, 2) *Confidentiality*, data exchanged during the transaction can only be read and understood by intended users, 3) *Non- repudiation*, participants of the transaction cannot deny their participation in the transaction and 4) *Data integrity*, data exchanged during the transaction is accurate [12]. Based on these four elements three important items were derived to cover different aspects of the security construct and examine the following hypothesis.

- H_5: SEC will have a positive effect on INTUSE.

A consumer who is confronted for the first time with a new technology has three options to meet it: 1) he can simply ignore it, 2) he can extensively deal with the innovation to acquire additional information about it, or 3) he can draw conclusions based on its existing knowledge about the new technology [30]. Therefore, the attitude towards NEW_TECH plays an important role for the future use of this technology.

- H_6: NEW_TECH will have a positive effect on INTUSE.

The introduction and use of M-payment is associated with costs, particularly with additional costs such as text messaging prices and fees for using M-payment. The consumers in the market each have a maximum amount of money they are willing to pay for each of the products. To find out what the consumer accepts for additional cost, the construct WTP is added to the research model.

- H_7: WTP will have a positive effect on INTUSE.

The following table presents the demographic data of the respondents from Germany and the USA.

Germany N = 128 / USA N = 64				
Gender	GER	USA	%GER	%USA
female	73	37	57	57,8
male	55	27	43	42,2
Age				
<18	10	12	7,8	18,8
18-25	53	33	41,4	51,6
26-35	36	5	28,1	7,8
36-45	19	5	14,8	7,8
46-60	8	7	6,3	10,9
>60	2	2	1,6	3,1
Net income per month in €				
<500	35	13	27,3	20,3
500-1500	31	10	24,2	15,6
1501-3000	27	14	21,1	21,9
>3000	12	8	9,4	12,5
not specified	23	19	18	29,7
Profession				
student	45	33	35,2	51,6
employee	49	15	38,3	23,4
public officer	10	1	7,8	1,6
self employed	10	10	7,8	15,6
pension	3	0	2,3	0
not specified	11	5	8,6	7,8

Table 1: Demographic Data

4 Measurement and Model Testing

Measurement validation and model testing were conducted using SmartPLS (Partial Least Squares), a variance analytical structural equation modeling technique that utilizes a component-based approach to estimation. In general, SEM is a technique for testing hypothesized relationships among variables by estimating a series of independent, separate multiple regressions. We choose SEM because SEM provides the researcher with the flexibility to model a relationship among criterion variables and multiple predictors, such as model errors in measurements for observed variables, to design unobservable latent

variables, and statistically test a priori theoretical and measurement assumptions against empirical data [5]. PLS uses a least squares estimation procedure, allowing the flexibility to represent both reflective and formative latent constructs, while placing minimal demands on measurement scales and distributional assumptions [5]. Thus SmartPLS was used to perform the analysis.

Firstly, the reflective construct intention to use (INTUSE) is analyzed. In this context we have examined the composite reliability, and the convergent and discriminate validity. The composite reliability (also known as internal consistency reliability-ICR) is similar to the Cronbach´s alpha and measures its internal consistence, "except that the latter presumes, a priori, that each indicator of a construct contributes equally (i.e., the loadings are set equal to one). Fornell and Lacker [17] argued that their measure is superior to Cronbach`s alpha because it uses the actual item loadings obtained within the nomological network to calculate internal consistency reliability. This measure, which is unaffected by scale length, is more general than Cronbach`s alpha, but the interpretation of the values obtained is similar ad the guidelines offered by Nunnally can be adopted" [21]. ICR should be 0.70 or higher [13]. The value is above the threshold, so that the internal consistency reliability is given. Convergent and discriminant validity was assessed by the average variance extracted (AVE). AVE represents the overall amount of variance in the indicators accounted by the latent construct. The reported values provide evidence of discriminant and convergent validity since the AVE is well above the recommended level of 0.50 [1]. The AVE values for all constructs in this model are higher than the recommended threshold value of 0.50, suggesting the convergent validity of the scale [1]. Table 2 shows internal consistency reliabilities and convergent and discriminant validities for the research data. The KMO value should be at least 0.5 [5],[16],[35]. Here the KMO is 0.500 for the whole reflective measurement model. Overall, the evidence of reliability, convergent validity, and discriminant validity indicates that the measurement model was appropriate for testing the structural model at a subsequent stage.

Con-struct	GER		USA		Indi-cator	Factor-loadings GER	Factor-loadings USA	KMO GER	KMO USA
	ICR	AVE	ICR	AVE					
INTUSE	0.0.913798	0.841418	0.923704	0.858227	INT1	0.946473	0.931007	0.500	0.500
					INT2	0.887143	0.921782		

Table 2:   **Validity and Reliability Criteria for Reflective Measurement Models**

In the next step, the formative constructs of the model are analyzed. In this case, formative indicators reflect the idea that "…, indicators could be viewed as causing rather than being caused by the latent variable measured by the indicators" [25]. For this purpose, the variance inflation factor (VIF), which assesses the degree of multi-collinearity of formative measurement models, in samples, both from Germany and USA have to be controlled. In the literature, a VIF-value of ≤ 10 is assumed as cut-off-criteria [39],[13]. The highest VIF calculated for Germany is 5.814 and for USA is 7.812, thus both are below the cut-off-criteria of VIFi>10. In the next step, the measurement model was tested, to specify the relationship among the measures underlying each construct. The results are shown in Table 3.

| GER					USA				
Latent variable	*Item*	*Weight*	*t-value*	*Sig.*	*Latente variable*	*Item*	*Weight*	*t-value*	*Sig.*
TRUST	TR1	0.866	33.553	***	TRUST	TR1	0.912	4.583	***
	TR2	0.784	17.266	***		TR2	0.796	3.758	***
	TR3	0.900	55.830	***		TR3	0.887	4.686	***
	TR4	0.605	45.113	***		TR4	0.800	3.528	***
	TR5	0.834	17.308	***		TR5	0.903	5.049	***
	TR6	0.864	21.559	***		TR6	0.903	4.913	***
PU	PU1	0.663	5.457	***	PU	PU1	0.825	13.953	***
	PU2	0.835	13.124	***		PU2	0.908	30.268	***
	PU3	0.906	27.863	***		PU3	0.928	45.064	***
PEOU	PEOU1	0.899	20.885	***	PEOU	PEOU1	0.916	11.537	***
	PEOU2	0.910	25.900	***		PEOU2	0.927	11.924	***
	PEOU3	0.927	31.444	***		PEOU3	0.898	12.227	***
SEC	SEC1	0.889	3.810	***	SEC	SEC1	0.942	4.121	***
	SEC2	0.919	3.563	***		SEC2	0.946	3.669	***
	SEC3	0.546	1.816	n.s.		SEC3	0.624	2.162	*
NEW_TECH	NT1	0.960	2.550	**	NEW_TECH	NT1	0.878	1.645	n.s.
	NT2	0.372	0.870	n.s.		NT2	-0.451	0.816	n.s.
WTP	WTP1	0.045	0.108	n.s.	WTP	WTP1	0.842	6.948	***
	WTP2	0.992	2.366	**		WTP2	0.707	3.894	***
Sig.:***: p < 0.001; **: p < 0.01; *: p < 0.05; n.s.: no significance									

Table 3:   Results of the Measurement Model Test – Formative Indicator Weights

5   Results, Discussion, Limitations and Further Research

5.1   Results and Discussion

To provide an overview SmartPLS was used to test a structural model. The path`s coefficients for the research model are shown in Figure 1. To get valid results, the bootstrapping resampling procedure with 1000 resamples and 128 cases for Germany and 1000 resamples and 64 cases for the USA are used. The reason is to obtain estimates of standard errors for testing the statistical significance of path coefficient using the t-test. Out of the 24 indicators chosen for the analysis, five indicators for Germany and six indicators for USA are not significant. H1 predicts that PEOU will have a positive effect on PU. This hypothesis is supported by the data for both countries. For Germany, the hypothesis is supported (ß=0.215; t-value=2.576, p<0.01) and for USA the hypothesis is supported as well (ß=0.425; t-value=3.005, p<0.01). H2 predicts that perceived ease of use will have a positive effect on the intention to use M-payment. This hypothesis is supported by the data for both countries. From table 3 it becomes clear that the indicator PEOU3 (ß=0.927) for Germany und PEOU2 (ß=0.927) for USA have the strongest positive influence on intention to use with a significance level of p<0.001. In contrast to Germany, PEOU3 for the USA (ß=0.898) is the weakest positive effect towards intention to use M-payment by having a significance level of p< 0.001. This effect is in total the weakest from all three

measured indicators. PEOU was operationalized by three indicators, which all have a strong positive influence on PU and are highly significant with p<0.001. Thus, the consumers of both countries admit that the hypothesis perceived ease of use has a positive influence on the intention to use M-payment. This hypothesis is significant but with a weak path coefficient.
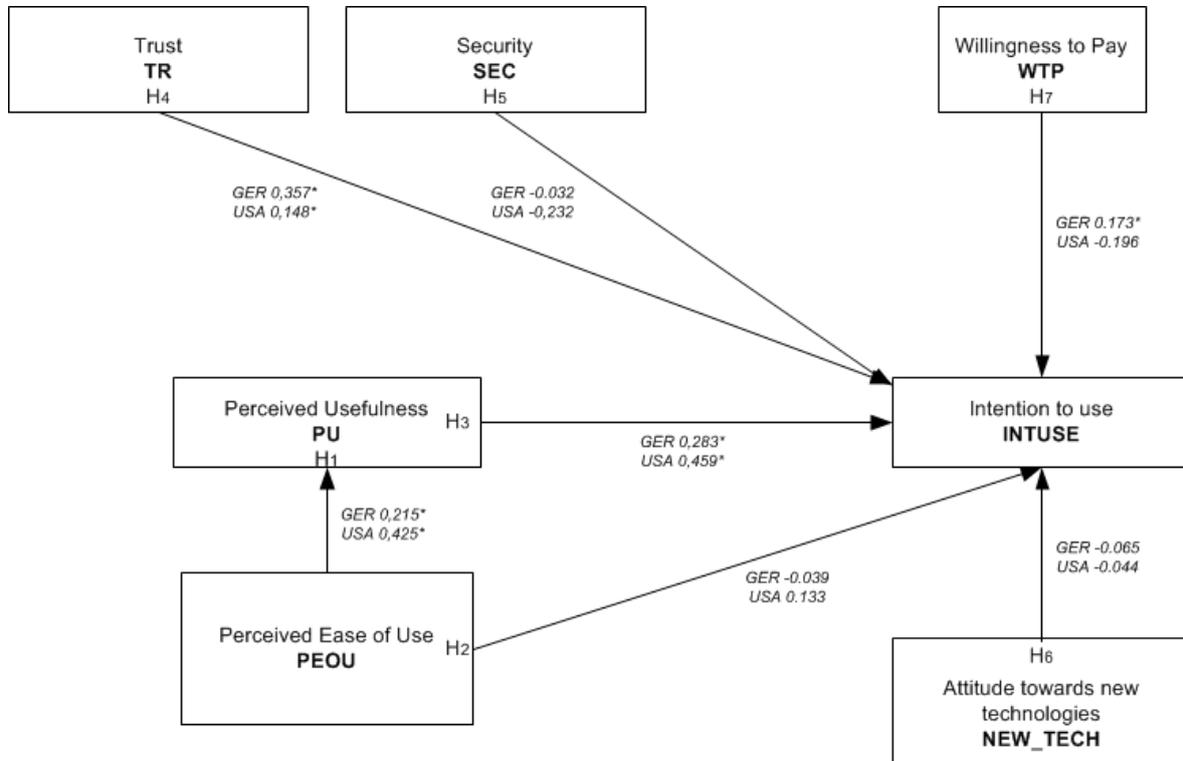
Figure 1:   **Research Model - Results**

H₃ predicts that PU will have a positive effect on INTUSE. The strongest effect has PU3 (GER: ß=0.906; t-value=27.863 and USA: ß=0.928; t-value=45.064) for both countries. It shows that for Germans and Americans the most important aspect is to save time by using M-payment. This can be seen as a big advantage of mobile payment [26]. In comparison to consumers in the USA, it can be seen that Germans do not view the M-payment as having an added value. This may result in the fact that many Germans are still using cash-money, compared to Americans, who mostly use credit-cards. **H₄** describes the effect from perceived trust with the intention to use M-payment. The construct consists of six indicators to measure, whether the consumers trust in M-payment services and/or applications or not. The study shows a positive influence for Germany (ß=0.357) and for the USA a weak positive influence (ß=0.148), and both having high significance. In Germany, this may result because of the aspect that M-payment is not very well known at all. **H₅** predicts that security will have a positive influence on the intention to use M-payment. As figure 1 show, the hypothesis could not be supported for the USA and for Germany as well. The construct security was operationalized by three indicators, of which only the first two indicators are highly significant. The third indicator demonstrates that the negative estimation towards security factors influences the intention to use M-payment negatively. This applies to both countries. **H₆** describes whether the attitude towards new technologies plays a role for the future use of M-payment. The hypothesis assumes that this attitude has a positive effect on the intention to use M-payment. For both countries this hypothesis can be rejected.

The negative path coefficient (GER: ß=-0.065; USA: ß=-0.044) highlights the negative influence, which is not significant. **H₇** predicts a positive influence of the consumer`s willingness to pay with the intention to use M-payment. This hypothesis can be supported for Germany but not for USA as already seen in figure 1. The positive influence which can be seen for Germany may result because consumers who are willing to pay for M-payment service are more likely to use the service. On the other hand, it can be seen that the negative path　　　　　　　　　　　　　　　　　　　　　　　　　　　　　coefficient (USA: ß=-0.196) shows that Americans are not willing to pay additional costs as much as Germans, for M-payment services. For Germany and the USA, four of seven hypotheses can be supported. Security and the attitude towards new technologies affect the intention to use negatively for both countries. Two constructs, perceived ease of use and willingness to pay, differ. For the perceived ease of use, Germany shows a slightly negative influence towards intention to use, while for the USA the influence of perceived ease of use is positive. For willingness to pay it is the opposite. Germany shows a positive and the USA a negative path coefficient. Considering our study, we can point out that the Americans demand a stronger perceived ease of use than the Germans do, while the Americans willing to pay less and Germans willing to pay more with M-payment. The payment habits differ for both countries.

5.2　　Limitations and Further Research

The generalizability of this study to M-payment is limited due to the following reasons. Firstly, this study considered the adjustment of users in Germany and the USA, but different countries have notable differences caused by cultural and economic differences. Countries such as Kenya as a developing country or South Korea and Japan, which are currently considered as the most advanced along with the USA and Europe (e. g. Finland) coming second and third, are not taken into account. Further research is therefore required to further test and validate the findings of this study in other countries. Secondly, this study does not include other CSF´s such as subjective norm, psychological and environmental CSF´s or factors such as information and system quality which are the factors affecting the information system success [11]. Furthermore, M-payment as a subset of mobile applications, which are then a subset of computer technology can provide an ensemble of other values that cannot be provided by e. g. paying cash or credit card: firstly, it is possible to pay location-independent ('anywhere paying'), secondly, M-payment can provide the user the freedom to pay without any time-restrictions (anywhere paying) as it would be due to normal banking hours.

In the past, the focus was on the technical aspect for the implementation of M-payment. However, for the success and user acceptance of M-payment, the essential requirement is to understand and design mobile payment from the consumers´ point of view, without obeying technical aspect. Ultimately, the user acceptance arises only, if M-payment fulfills the requirements, and minimizes existing concerns, prejudices and fears and creates an additional benefit for the consumer. Thus it can be noted, that for the success of mobile payment, the consumer requirements have to be adapted to country-specific scenarios, so that M-payment can prevail in the near future. M-payment providers should consider the following factors: security, trust and willingness to pay when implementing the system. The explorative survey, the literature review and the market study have pointed out that the

respondents are concerned about these three factors. At the moment the readiness to accept M-payment is approximately balanced in Germany and the USA.

Future research in this area includes a quantitative analysis of other countries, as mentioned above. Furthermore, it is important to think about the research model and other constructs which influence the acceptance of M-payment. One of the highest priorities is to also add value for the consumers and to spread the m-payment methods also beyond cities, to increase acceptance through the whole population.

6   References

[1] Bhattacherjee, A; Premkumar, G (2004): Understanding changes in belief and attitude toward information technology usage: A theoretical model and longitudinal test. MIS Quarterly 28(2):229-254.

[2] Buse, S; Tiwari, R (2008): Perspektiven des Mobile Commerce in Deutschland, Grundlagen, Strategien, Kundenakzeptanz, Erfolgsfaktoren. Shaker-Verlag, Aachen.

[3] Candace, DP (2005): E-Commerce belief and M-Commerce Technologies, IRM Press: 60-61.

[4] Chen, L-D (2006): Attitude toward information technology usage: A theoretical model of consumer acceptance of mPayment. In: Romano Jr., N (Ed.), Proceedings of the 12th Americas Conference on Information Systems (AMCIS). Acapulco, Mexico.

[5] Chin, WW (1998): Issues and Opinion on Structural Equation Modeling. MIS Quarterly 22(1):7-16.

[6] Chou, Y; Lee, C; Chung, J (2004): Understanding m-commerce payment systems through the analytic hierarchy process. Journal of Business Research 57(12): 1423-1430.

[7] Cureton, EE; D'Agostino, RB (1983): Factor Analysis – An Applied Approach. Lawrence Erlbaum Associates, Inc., Hillsdale, New Jersey.

[8] Dahlberg, T (2006): Understanding changes in consumer payment habits – do mobile payments attract consumers? In: Presentation at Helsinki Mobility Roundtable, Helsinki, Finland, June 1-2.

[9] Davis, FD (1989): Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. MIS Quarterly, 13(3):318-340.

[10] Davis, FD; Bagozzi, RP; Warshaw, PR (1989): User Acceptance of Computer Technology: A Comparison of Two Theoretical Models. Management Science 35(8): 982-1003.

[11] DeLone, WH; McLean, ER (1992): Information Systems Success: The Quest for the Dependant Variable. Information Systems Research 3(1):60-95.

[12] Dewan, SG; Chen, L (2005): Mobile Payment adoption in the US. A cross-industry cross-platform solution. Journal of Information and Privacy. USA.

[13] Diamantoloulos, A; Riefler, P; Roth, KP (2008): Advancing formative measurement models. Journal of Business Research 61(2008):1203-1218.

[14] Ding, MS; Unnithan, CR (2004): Mobile Payments (M-payments) - An Exploratory Study of Emerging Issues and Future Trends. In: Deans, PC (Ed.): E-Commerce and M-Commerce Technologies. Hersehy u.a.:57-79.

[15] Edgar, Dunn, and Company (2007): Mobile financial services study.

[16] Fishbein, M; Aijzen, I (1975): Beliefs, Attitude, Intention and Behaviour: An Introduction to Theory and Research, Reading, 1975, MA: Addison-Wesley.

[17] Fornell, C; Larcker, DF (1981): Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. Journal of Marketing Research 18: 39-50.

[18] Gliem, JA; Gliem RR (2003): Calculating, interpreting, and reporting Cronbach`s alpha reliability coefficient for likert-type scales. Midwest Research-to-Practice Conference in Adult, Continuing, and Community Education, October 8-10. Ohio State University, Columbus.

[19] Goecke, L; Pousttchi, K (2010): A scenario-based analysis of mobile payment acceptance, Ninth International Conference on Mobile Business. Athen, June 13-15.

[20] Herzberg, A (2003): Payments and Banking with Mobile Personal Devices. Communications of the ACM 46(5):53-58.

[21] Howell, JM; Avolio, BJ (1993): Transformational Leadership, Transactional Leadership, Locus for Control, and Support for Information: Key Predictors of Consolidated-Business-Unit Performance. Journal of Applied Psychology 78(6):891-902.

[22] Hu, WC; Lee, CW; Kou, W (2005): Advances in Security and Payment Methods for Mobile Commerce, Idea Group Publishing, Hershey/ London/ Melbourne/ Singapoure.

[23] Kleijnen, M; Wetzels, M; de Ruyter, K (2004): Consumer acceptance of wireless finance, Journal of Financial Services Marketing 8(3): 206-217.

[24] Lee, M; Turban, E (2001): A Trust Model for Consumer Internet Shopping. In: International Journal of Electronic Commerce 6(1): 75-91.

[25] MacCallum, C; Browne, MW (1993): The Use of Causal Indicators in Covariance Structure Models: Some Practical Issues. Psychological Bulletin 114(3):533-541.

[26] Mallat, N; Rossi, M; Tuunainen, VK (2004): Mobile banking services. Communications of the ACM 47(5):42-46.

[27] Mallat, N; Dahlberg, T (2005): Consumer and merchant adoption of mobile payment solutions. In: Managing business in a multi-channel world: Success factors for e-business. Hershey, PA 17033, USA. Idea Group Publishing: 8.

[28] Mallat, N; Rossi, M; Tuunainen, V; Öörni, A (2006): The Impact of Use Situation and Mobilityon the Acceptance of Mobile Ticketing Services. Proceedings of the 39th Hawaii International Conference on System Sciences.

[29] Menke, L; de Lussanet, M (2006): SMS-based mobile payment. Popular with the young. Forrester Research.

[30] Mukherjee, A; Hoyer, WD (1999): The Effect of Novel Attributes on Product Evaluation. Moderating Role of Complexity, Association for Consumer Research, Columbus.

[31] Paavilainen, J (2002): Mobile Business Strategies. Understanding the Technologies and Opportunities (Wireless Press), Addison-Wesley Longman, Amsterdam, Netherlands.

[32] Peleschka M (2006): Near Field Communication (NFC) als weiterer Baustein des Pervasive Computing, Wien, Austria.

[33] Pousttchi, K; Wiedemann, DG (2007): Success Factors in Mobile Viral Marketing. A Multi-Case Study Approach, MPRA Paper 5736, University Library of Munich, Germany.

[34] Schulenburg, H (2008): Die Zukunft des Mobile Commerce, Kontor Verlag, Hamburg: 76ff.

[35] Streiner, DL (2003): Starting at the Beginning: An Introduction to Coefficient Alpha and Internal Consistency. Journal of Personality Assessment 80(1):99-103.

[36] Turowski, K; Pousttchi, K (2004): Mobile Commerce. Grundlagen und Techniken, Springer Verlag Berlin Heidelberg:164-165.

[37] Van der Heijden, H (2002): Factors affecting the successful introduction of mobile payment systems. Proceedings of the 15th Bled eCommerce Conference, Bled, Slovenia, June 17-19.

[38] Venkatesh, V et al. (2003): User Acceptance of Information Technology: Toward a Unified View. MIS Quartely 27(3):425-478.

[39] Weiber, R; Mühlhaus, D (2010): Strukturgleichungsmodellierung – Eine anwendungs-orientierte Einführung in die Kausalanalyse mit Hilfe von AMOS, SmartPLS und SPSS, Springer, Heidelberg.

[40] Wolfe, D (2007): The tech scene. PayPal, Skype link a play for remittances. American Banker 172 (37), 1.

[41] Zmijewska, A; Lawrence, E; Steele, R (2004): Towards understanding of factors influencing user acceptance of mobile payment systems. Proceedings of the IADIS International Conference WWW/Internet. Sydney: 273-275.