

# User Acceptance of Customer Self-Service Portals

L. Hartmann, F. Kerksenfischer, T. Fritsch, and T. Nguyen

**Abstract**—The attitude of users towards an online customer self-service portal, which is newly introduced by one of the biggest finance companies worldwide, is the focus of this article. The Technology Acceptance Model (TAM), proposed by Davis in 1986, is applied to evaluate 521 customer responses to a questionnaire consisting of 22 questions.

The authors choose partial least squares (PLS) as statistical instrument and define “attitude of customers towards the online self-service portal” as the dependent variable. Apart from this, six factors are specified to directly or indirectly correlate with attitude.

It is found that self-efficacy, innovation anxiety and innovation affinity correlate both directly and indirectly with attitude whereas the mediator for the indirect impact is perceived ease of use. Furthermore, value of paper form correlates directly and indirectly with attitude whereas in this case perceived usefulness is the mediator for the indirect link. Comparing both mediators, perceived usefulness is found to influence attitude of customers towards the online portal by more than 50% than perceived ease of use does.

The article is structured into an introductory part where the applied methods are investigated shortly and a description of the theoretical background of the TAM, followed by a description of the applied model. Afterwards, the reader finds a description of the generated results while the last parts discuss and conclude the stated findings. The leading question of research within this paper is: Which factors influence user acceptance of a new customer self-service portal?

**Index Terms**—Customer self-service portal, user acceptance, Technology Acceptance Model (TAM), partial least squares (PLS), consumer behaviour, insurance company.

## I. INTRODUCTION

The following article discusses the results of a study regarding the user acceptance of a newly introduced self-service portal for customers of an insurance company. It is undertaken in the context of a new customer self-service portal which is introduced by a finance company six weeks prior to the research. The introduction of the customer portal is meant to simplify the communication between company and customers and to replace all administrative paperwork. Furthermore, the portal is developed in order to provide an alternative tool to communication via telephone or letter. The portal enables its users to manage insurance contracts online,

Manuscript received September 17, 2012; revised November 20, 2012.

L. Hartmann is with the University of Bern, Leer, 266789, Germany (e-mail: lhartmann@web.de).

F. Kerksenfischer is with the Department of Information Systems, TU München, Munich, 80333 Germany (e-mail: Ozodis@googlemail.com).

T. Fritsch is with the Department of Business Administration, FU Berlin, Berlin, 14195, Germany (e-mail: t.fritsch@gmx.net).

T. Nguyen is with the Department of National economy, Insurance & Health, Hochschule Lahr, Lahr, 77933, Germany (e-mail: tristan.nguyen@hl-lahr.de).

to access insurance-specific e-mails, to change personal data when necessary and to report claims. The aim of the research is to analyse the factors which influence the decision of customers to accept or reject the new portal. The portal can be adapted by customers voluntarily and free of charge. In addition, to give an incentive to users to implement the program, they automatically participate in a competition in which high-quality digital cameras and tablet PCs can be won.

In order to investigate our research objectives, this article is structured in the following five parts: The first section gives a short overview of the theoretical background concerning the TAM and its implications for economic research. Among other things, different versions of the TAM starting with the introductory stage and ending with the status quo are described. The second part is devoted to the description of the methods the authors apply in their research. Hence, the reader finds the questionnaire and how its results are converted into a model by means of partial least squares. Third, the research results are documented. Accordingly, the respective path coefficients are named. Furthermore, this part describes the implications of the bootstrapping analysis. This is followed by a discussion of the stated results. The last part, the conclusion, critically sums up the implications of our results, challenges the applied method and gives an outlook for future research concerning user acceptance of new technologies and its influencing factors.

## II. BACKGROUND

The TAM developed by Davis (1986) is used to explain user acceptance of an online service portal [1]. He wanted to draw some implications for practitioners about how to adapt the design of system characteristics in order to improve user acceptance [2]. His model was meant to give answers to two questions: Which factors determine the attitude of people towards using newly introduced information systems? How strong is the impact of system characteristics on user acceptance? Both questions are closely related to our leading question which we answer in the discussion section of this paper after having analysed the data collected through the questionnaires.

Aligned with the theory of reasoned action (TRA), which was proposed by Fishbein and Ajzen (1975), the TAM examines the causal relationship between external stimuli, cognitive response, affective response and behavioural response [3]. It specifies perceived usefulness and perceived ease of use as the two most important determinants of system use whereas the first is found to be 50% more influential than the latter [2]. As it is defined by Venkatesh et al. (2008), perceived usefulness is an indicator for the extent of job

performance improvement perceived by a person who applies the new system. Instead, perceived ease of use measures the degree to which a person assumes that using the new information system will be free of effort [5].

In this context, we conclude from the results mentioned above that people favour to have an added value rather than not to have any efforts with using the new portal. As image, job relevance, output quality and result demonstrability are found to be determinants for perceived usefulness, the influence of the program on the quality of work and the goodness of achieved results respectively seem to be the most decisive factors regarding the decision for or against applying a new technology. This implicates that the customer portal should enable users to communicate with their insurance and to manage the matters of their insurance contracts more efficiently. Processes have to be faster and the results are supposed to be optimised with respect to the situation of not using an online customer portal.

Furthermore, the model confirms not only direct causal effects which external stimuli have on perceived usefulness, perceived ease of use and attitude towards using, the online portal also specifies a significant impact of perceived ease of use on perceived usefulness. Instead, usefulness does not influence ease of use [6]. Knowing this, we can partly answer our leading question of which factors influence customer attitude towards using the portal.

To define attitude towards using, principles from the TRA from Fishbein and Ajzen (1975) are employed [3]. Their theory is mainly characterised by the following: First, it concludes how to measure the components of attitudes which are relevant for a person's behaviour; second, it differentiates between beliefs and attitudes and third, it explains how external stimuli like system characteristics are causally interrelated to behaviour, attitudes and beliefs. The TAM was developed over time. Thus, three different versions exist in literature. While the original TAM does not differentiate among external variables and just names four elements (external variables, usefulness, ease of use and attitude towards using) in a functional chain explaining actual system use, two model components are added in the TAM 2 [7]. On the one hand, it examines five different external stimuli effecting perceived usefulness which are subjective norms, image, job relevance, output quality and result demonstrability. On the other hand, experience and voluntariness are defined as additional mediating factors influencing the causal effect of subjective norm on attitude towards using. Besides, experience also appears to be a mediator on the path from subjective norm towards perceived usefulness. It implicates that experience influences the user's perception of the added value with regard to his or her job performance. People who are familiar with the specific system seem to evaluate perceived usefulness differently from those who are not.

For the future, this means that people's evaluation of the usefulness of a new software is steadily improving. As the number of online customer portals on the market is rapidly increasing, experience with technology is accumulated which leads towards enhanced perceived usefulness.

Subjective norm and image as determinants for perceived usefulness present the processes of social influence. Instead,

the influence of cognitive instrumental processes on perceived usefulness is represented by the other three external determinants and the ease of use of the TAM 2. Using these determinants, the model takes into account that persons judge perceived usefulness by cognitively comparing what the information system can theoretically contribute to their job tasks and what actually has to be done in their job [7].

The second modification of the TAM, the TAM 3, was introduced by Venkatesh and Bala in 2008 [4]. It includes six determinants of perceived ease of use and differentiates between anchors and adjustments. Anchors are general beliefs about computers and computer usage and are represented by computer self-efficacy, perceptions of external control, computer anxiety and computer playfulness. Adjustments, which are perceived enjoyment and objective usability, are defined as beliefs that are developed on the basis of direct experience with the respective system [8].

In general, the path characteristics found in the TAM and the TAM 2 also hold for this model but additionally, experience is found to mediate the relationship between anchor and adjustment determinants, perceived usefulness and perceived ease of use respectively. The only exceptions are computer self-efficacy and the perceptions of external control. They influence perceived ease of use directly without a mediator. Furthermore, in the TAM 3 experience mediates the relationship between perceived ease of use and perceived usefulness and that between perceived ease of use and behavioural intention. Hence, experience is found to be a crucial mediator when examining the functional paths from external independent variables to the dependent variable of actual system use. Venkatesh and Bala (2008) assume that users with greater hands-on experience have more information about how easy it is to use an information system [4].

The research of this paper is done in order to find out which determinants influence the decision of IT-users whether to accept or reject a customer self-service portal which is introduced by an insurance company. Since "attitude of customers towards the online self-service portal", the variable in question, is indirectly and directly dependent from external variables as well as from perceived usefulness and perceived ease of use, the authors choose regression analyses as methodological basis for their research. This statistical instrument enables the applicant to quantify the extent to which different independent factors have an effect on one or more dependent variables. It is examined which factors correlate to which extent with the dependent variable and how independent variables do influence each other. As a result, significant correlations in manifold directions are found and illustrated in a path model.

As a result, we answer the question of which factors affect the attitude of users concerning the newly introduced customer self-service portal. The motivation for the research is to deduce valuable implications for the leaflet design and marketing of customer self-service portal. Customers are asked to fill in a questionnaire. The answers are evaluated applying the Technology Acceptance Model (TAM) which was introduced by Davis (1986) in his doctoral thesis [1]. This statistical tool is applied because it provides a highly

valid measurement for testing user acceptance and addresses the application purpose of this research. It is meant to exclusively investigate the introduction of new technologies [9]. The study analyses the essential motives, which influence customer decisions whether or not to use the newly introduced portal. Additionally, regression analyses is used to measure the magnitude and direction of customer influence on the dependent variable “attitude of customers towards using the new software”.

In comparison to the theory of the TAM the findings of this article give important implications for answering the research question that is which factors determine the attitude of users towards applying a new technology to which extent. This research supplies worthwhile knowledge for the optimization process of developing online customer portals as the research generates highly valid results.

### III. METHOD

As mentioned before, the customer self-service portal which is the object of this study enables its users to manage insurance contracts online, to access insurance-specific e-mails, to change personal data when necessary and to report claims. Furthermore, the decision to invest into this software is connected to the abdication of any paper for the whole communication process between customer and insurance company. The adoption of this software is linked to an automatic participation in a competition where gifts like iPad2s, digital cameras and USB-sticks can be won.

After six weeks of introduction, ten thousand customers were asked to answer a questionnaire concerning their decision for or against the new portal. They got a letter with the description of the background of the survey and additionally, just as a reminder, the original flyer which advertised the new portal six weeks ago. From the base of ten thousand possible participants, 521 customer responses are evaluated. Thus, the research is done with a data base of N=521.

The questionnaire mentioned above consists of nine categories of questions which are perceived ease of use, perceived usefulness, individual innovation affinity, perceived self-efficacy, computer-based innovation anxiety, value of paper form, attitude towards the new program, risk-based conviction and actual behaviour. The last category is integrated just to find out if the respective customer buys into the innovation or not. Other categories contain up to four questions which can be answered on a scale from 1 to 7 (1 = “I do absolutely not agree” and 7 = “I absolutely agree”).

On the basis of the answers handed in, partial least squares path modelling (PLS) is applied to generate a technology acceptance model. As it is supposed by Davis (1986), we differentiate between external variables (in this case defined as self-efficacy, innovation anxiety, innovation affinity and value of paper form), two measures for internal customer beliefs which are perceived usefulness and perceived ease of use and a variable standing for customer attitude towards the new program [9].

We conduct a regression analysis and investigate the relationships between the external variables perceived ease of use, perceived usefulness and attitude. The found

correlations are described in the next section. The extensiveness of the model parameters is conducted from the questionnaire with the questions used as observable variables.

The method of PLS is an iterative method which applies alternating least squares algorithms in order to analyse high dimensional data in a low-structure environment [10]. It differentiates between an inner and an outer model whereas relationships among unobserved (or latent) variables are considered in the inner model and those between unobserved variables and their observed (or manifest) parameters in the outer model. In the case of our research, the named parameters of the TAM are unobservable. Thus, the construct consisting of the external variables perceived ease of use, perceived usefulness and attitude builds the inner model. Instead, the outer model investigates the linkages between questions from the questionnaire and the model’s seven (unobservable) variables.

In this research, the reflective mode of PLS, as it is explained by Henseler (2009), is applied which means that each observed variable (X) can be expressed as a linear function of its corresponding latent variable (Y) plus a residual term  $\epsilon$ , like  $X = \Omega Y + \epsilon$  [10].

The iterative process proceeds in four steps: First, outer approximations of latent variable scores are generated (outer proxies of latent variables are expressed as a linear function of their respective indicators whereas the weights result from the last step of the previous iteration). Second, inner weights (intensity of connection between one latent variable and another) are estimated. Third, inner proxies of latent variables are calculated (inner proxies are generated with the help of linear combinations from outer proxies of their respective adjacent latent variables). Fourth, the method of PLS estimates outer weights (covariance’s between inner proxies of latent variables and its indicators). These steps proceed as often as convergence is obtained. That means outer weights between two iterations change to an extent which is below a predefined limit.

With the process described, latent variable scores are provided and for the determination of path coefficients PLS conducts a (multiple) linear regression for each dependent unobservable variable [10].

Using this method, we generate the results which are shown in the next section.

### IV. RESULTS

The following section serves to sum up the results of the research using some tables and figures to illustrate the major findings most accurately.

Firstly, see Table I for all variables integrated in the PLS regression.

TABLE I: VARIABLES OF THE PLS REGRESSION

independent variables	mediator variables	dependent variables
self-efficacy		
innovation anxiety	perceived ease of use	attitude towards using the new system
innovation affinity	perceived usefulness	
value of paper form		

The PLS regression analysis shows that three external

components correlate with perceived ease of use namely self-efficacy, innovation anxiety and innovation affinity (see Fig. 1 and Table II). A positive coefficient (0.368) is only measured for innovation anxiety, the coefficients for self-efficacy and innovation affinity are negative (-0.360 and -0.172). Additionally, direct correlations of these three factors with the variable “attitude towards using” can be found. Innovation affinity correlates with attitude with a coefficient of 0.1054, innovation anxiety correlates with -0.1696 whereas self-efficacy has a path coefficient of -0.3019.

Furthermore, the method of PLS analysis generates a coefficient of 0.157 for the path from perceived ease of use to attitude towards using. The model calculates a value for R2 of 0.638 with respect to perceived ease of use which is relatively high.

The model includes value of paper form as fourth external factor. This factor correlates with attitude towards using and

perceived usefulness. The path coefficients are 0.0804 and 0.0895 which indicates that the degree of correlation is low.

TABLE II: PATH COEFFICIENTS

path coefficients	perceived ease of use	perceived usefulness	Attitude towards using
self-efficacy	-0,3600***	0	-0,3019***
innovation anxiety	-0,1716***	0	-0,1696***
innovation affinity	0,3682***	0	0,1054**
value of paper form	0	0,0895***	0,0804***
perceived ease of use	0	0,7355***	0,157 ***
perceived usefulness	0	0	0,2197***
attitude towards using	0	0	0

Note: \*\* = p < .05, \*\*\* = p < .01

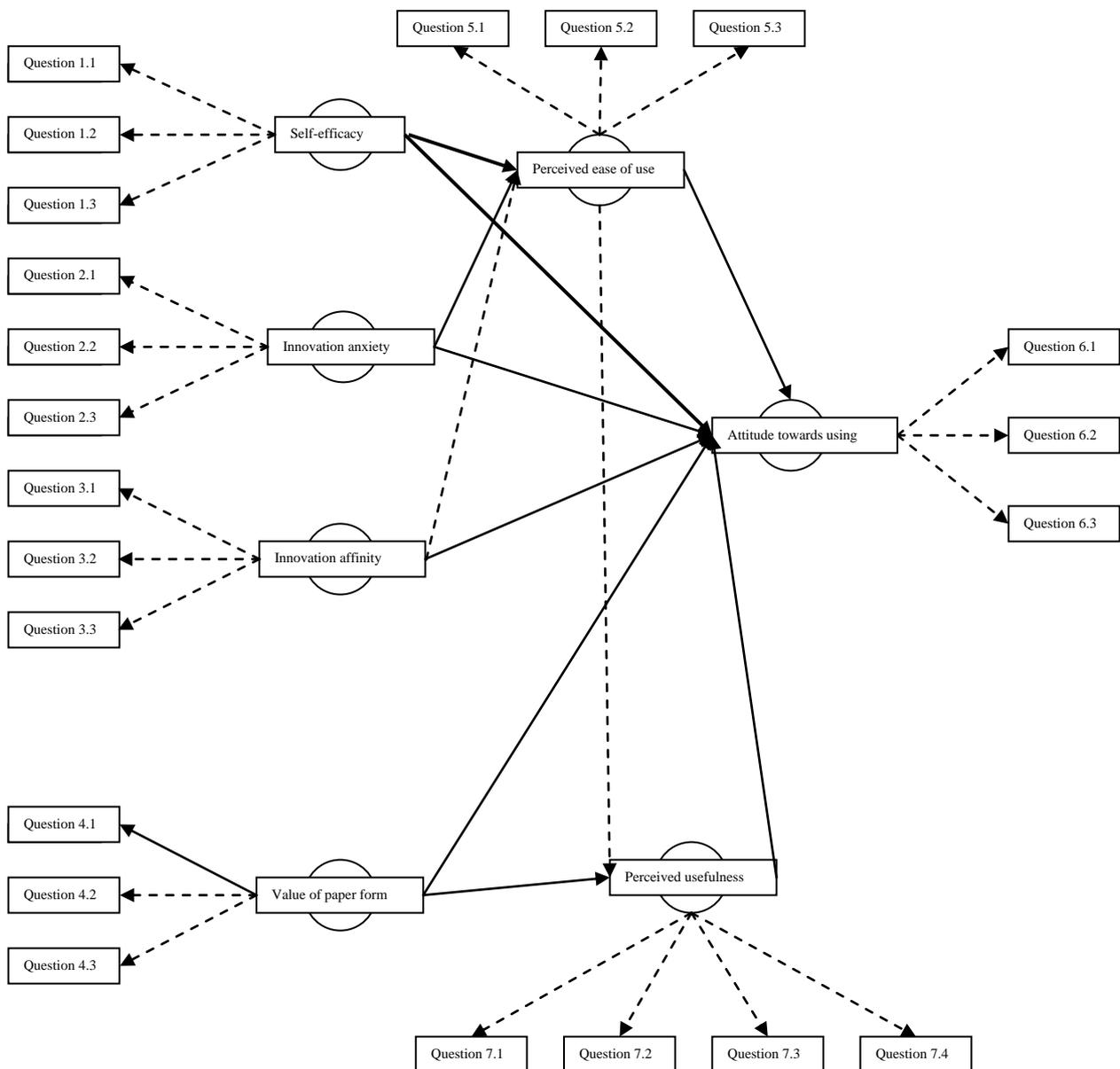


Fig. 1. Resulting path model (with path coefficients: < -0.2197 bold, ≥ -0.2197 and ≤ 0.2197 regular, > 0.2197 dashed).

Another path to perceived usefulness is determined from perceived ease of use. The coefficient of 0.7355 is the highest

in the whole model. The value of R2 for perceived usefulness amounts to 0.5757 which is indeed lower than that of

perceived ease of use but still above 50%.

Finally, a coefficient of 0.2197 is found for the path from perceived usefulness to attitude towards using. This correlation is higher than the correlation between perceived ease of use and attitude towards using so that the relationship between those variables must be stronger. Altogether, the variance of attitude towards using is explained by more than 50%. The model generates a value of 0.7238 for R<sup>2</sup>.

As already stated in the model description, every variable

is defined by three questions in the questionnaire except for perceived usefulness which is determined with the help of four questions. All questions have path coefficients above 0.8 with again some exceptions: Question WP1 which is the first question corresponding with the variable value of paper form has a coefficient of 0.209. The coefficient of the third question (Question WP3) corresponding with the variable value of paper form is as well lower than most coefficients and amounts just to 0.626.

TABLE III: RELIABILITY ANALYSIS

	R <sup>2</sup>	Average Variance Extracted (AVE)	Cronbach's Alpha (CA)	Communality	Composite Reliability (CR)	Redundancy
self-efficacy	0	0,7316	0,8166	0,7316	0,891	0
innovation anxiety	0	0,6916	0,7768	0,6916	0,8705	0
innovation affinity	0	0,6813	0,7660	0,6813	0,865	0
value of paper form	0	0,4157	0,6091	0,4157	0,6323	0
perceived ease of use	0,6383	0,6941	0,7794	0,6941	0,8718	0,2761
perceived usefulness	0,5757	0,6855	0,8468	0,6855	0,897	0,0238
attitude towards using	0,7228	0,7592	0,8404	0,7592	0,9041	0,1019

In addition to examining the path coefficients, the study also analyses how reliable the model results are (see Table III). The research investigates five measures apart from R<sup>2</sup>. These are average variance extracted (AVE), composite reliability (CR), Cronbach's alpha (CA), communality and redundancy. It can be seen that only the AVE for value of paper form (0.4157) is lower than 0.5 which means that less than 50% of the variance of this indicator can be explained with the latent variable which in this case is technology acceptance of users. Other values for AVE are above 0.5 which implicates that the model generates reliable values for the remaining indicators. CA measures the internal consistency of a scale. It is defined as the average correlation among different sample items. The value should be higher than 0.56, otherwise the model's scale is expected to be inconsistent. For the indicators of this study value of paper form is again the only critical measure. Its CA amounts to 0.6091. Other values are close to one which implicates the scale's consistency. Communality which measures the percentage of variance in a given variable which

is explained by all unobserved variables jointly is also high for all indicators in the model except for value of paper form (0.4157). The same is true for composite reliability which is defined as the average realized variance. For value of paper form, CR is determined to be 0.6323 which is the lowest value for CR in the model.

Others are close to one which gives positive implications for the reliability of the model.

Last, the value of redundancy is highest for perceived ease of use. It is 0.2761. The remaining values for this measure are close to zero or even zero. We interpret that the model is not distorted by information spillover.

## V. DISCUSSION

The research had one main objective namely to identify

factors which influence the decision of users for or against using the new portal. To accomplish these objectives, we used the TAM and generated the results described in the previous section.

Looking at the upper part of Fig. 2 the set of correlations illustrated by the different arrows is intuitive which means that the directions of the algebraic signs are expected whereupon the factor of self-efficacy constitutes an exception. The degree of self-efficacy correlates negatively with both perceived ease of use and attitude towards using. Whereas self-efficacy is defined by Bandura (1982) as "judgments of how well one can execute courses of action required dealing with prospective situations", this means that people who look upon their own competencies with regard to internet-based applications as favorable tend to reject using the new technology [11]. Taking a closer look at the mediator variable perceived ease of use, we find a respectively high value for R<sup>2</sup>. This gives implications for the quality of the regression analysis for this variable. It can be interpreted that the regression explains the gross of the variable's variance.

The value of R<sup>2</sup> for perceived usefulness is lower than that of perceived ease of use. The reason might be that the model just found two variables which correspond with perceived usefulness compared to three paths with respect to perceived ease of use. As the correlation between perceived usefulness and attitude towards using is higher than the correlation between perceived ease of use and attitude towards using, we assume that the relationship between those variables must be stronger.

The results reveal that the path coefficients of the questions WP1 (0.209) and WP3 (0.626) are low compared to the other ones. Though, the relationship is rather low and it can be interpreted that those questions, especially question WP1, give only few implications for the degree of value of paper form which is perceived by the survey's participants. The authors realize that the independent variable value of paper form falls out of line with respect to reliability. All of

the investigated six measures are lowest for value of paper form which therefore is the critical variable.

The results for value of paper form can have different reasons. It might be the questions that were chosen wrongly to give implications for the value that customers assign to this form of communication. The values of the path coefficients with respect to the questions confirm this thesis. Looking at the direct path from value of paper form to attitude towards using and the indirect path via perceived usefulness, we notice a low but significant correlation which indicates that value of paper form is not a very meaningful indicator for the interviewed consumers. The conclusion that should be drawn from these results might affect the way of advertising the new customer self-service portal. The flyer that promoted the portal emphasised the benefit from eliminating the use of paper repeatedly which seems, however, not to be the crucial factor that influences perceived usefulness and acceptance of customers. On the other hand, the results of the reliability analysis confirm these results.

In summary, our research provides very intuitive results with respect to the variables of the regression except for value of paper form. Our major finding is that value of paper form doesn't have a considerable impact on user acceptance of a new customer self-service portal as the results are lowest for this variable. Nevertheless, this variable should be taken into account in other contexts. Value of paper form might still affect actual user numbers driven by other factors like environmental awareness and social acceptance. To achieve better user acceptance value of paper form, however, isn't the first factor to focus on.

## VI. CONCLUSION

New self-service portals are becoming more and more interesting as current research topic, not only in connection with insurance companies. Kumar and Telang (2011) e.g. examined the challenges and opportunities of self-service technologies at a prominent U.S. health insurance firm [12]. They found out that the utilization of web-based self-service portals saves a lot of costs of interacting with customers. On the other hand, if information about, for impact, customer health policies is ambiguous the introduction of self-service portals can lead to even more calls and therefore increasing service costs. Van Riel et al. (2001) explored consumer evaluations of e-services by conducting an empirical study of an Internet portal [13]. They found a strong positive effect of customers' overall satisfaction on the intention to continue using the portal. Lin and Hsieh (2006) examined how technology readiness influences customers' perception and adoption of self-service technologies [14]. Results indicate that technology readiness influences perceived self-service technologies, service quality and behavioral intentions. In the context of our research we applied the TAM to identify the factors which most influence user acceptance of customer self-service portals. The authors used data of 521 completed questionnaires to analyse the influence of six variables on attitude towards using the portal. It is value of paper form that provides least information regarding user acceptance. The bootstrapping analysis confirmed the value of the research. It should be emphasised that the results just reflect the observed attitude of users towards the new self-service portal and not

their actual behaviour. Moreover, the study concentrates on the results of a questionnaire among the customers of an insurance company within Germany. Therefore the results are just reliable under the specific circumstances we implemented the survey. Clients of other companies might have a different approach to a new portal like the one we examined. As a first step, the authors collected relevant practical data that illustrate the opinion of users on the new portal. It is conceivable to look at the user numbers to validate the results regarding the actual utilization of the new portal. Further studies should concentrate on the implications that go hand in hand with the results. Further research questions might be related to questions about how to adapt the design of system characteristics and marketing concepts in order to improve user acceptance. Therefore this study can only represent a small cutout of the current situation.

## REFERENCES

- [1] F. D. Davis, "A technology acceptance model for empirically testing new end-user information systems: theory and results," Ph.D. dissertation, MIT Sloan School of Management, Cambridge, MA, 1986.
- [2] F. D. Davis, "User acceptance of information technology: system characteristics, user perceptions and behavioral impacts," *Int. J. Man-Machine Studies*, vol. 38, pp. 475-487, 1993.
- [3] M. Fishbein and I. Ajzen, *Belief, Attitude, Intention, and Behavior: An Introduction to Theory and Research*, Addison-Wesley, Reading, MA, 1975.
- [4] P. Legris, J. Ingham and P. Collette, "Why do people use information technology? A critical review of the technology acceptance model," *Information & Management*, vol. 40, pp. 191-204, 2003.
- [5] V. Venkatesh and H. Bala, "Technology Acceptance Model 3 and a Research Agenda on Interventions," *Decision Sciences*, vol. 39, no. 2, pp. 273-304, 2008.
- [6] F. D. Davis, R. Bagozzi, and P. R. Warshaw, "User acceptance of computer technology: a comparison of two theoretical models," *Management Science*, vol. 35, no. 8, pp. 982-1003, 1989.
- [7] F. D. Davis and V. Venkatesh, "A theoretical extension of the technology acceptance model: Four longitudinal field studies," *Management Science*, vol. 46, pp. 186-204, 2000.
- [8] V. Venkatesh, "Determinants of Perceived Ease of Use: Integrating Control, Intrinsic Motivation, and Emotion into the Technology Acceptance Model," *Information Systems Research*, vol. 11, no. pp. 342-365, 2000.
- [9] F. D. Davis, "Perceived usefulness, perceived ease of use, and user acceptance of information technology," *MIS Quarterly*, vol. 13, no. 3, pp. 319-340, 1989.
- [10] J. Henseler, C. M. Ringle, and R. R. Sinkovics, "The Use of Partial Least Squares Path Modeling in International Marketing," *Advances in International Marketing*, vol. 20, pp. 277-319, 2009.
- [11] A. Bandura, "Self-Efficacy Mechanism in Human Agency," *American Psychologist*, vol. 37, no. 2, February 1982.
- [12] A. Kumar and R. Telang, "Does the Web Reduce Customer Service Cost? Empirical Evidence from a Call Center," *Information Systems Research*, isre.1110.0390; published online before print, 2011.
- [13] A. C. R. Van Riel, V. Liljander and P. Jurriens, "Exploring consumer evaluations of e-services: a portal site," *International Journal of Service Industry Management*, vol. 12, iss. 4, pp. 359-377, 2001.
- [14] J.-S. C. Lin and P.-I. Hsieh, "The role of technology readiness in customers' perception and adoption of self-service technologies," *International Journal of Service Industry Management*, vol. 17, iss. 5, pp. 497-517, 2006.



**Tobias Fritsch** completed his Doctoral Thesis in Computer Science at FU Berlin, Germany. He also holds several graduate degrees in Informatics, Economics, Business Administration and Social Sciences. He is leading several research projects at Allianz insurance company in Munich. In his role he is responsible for several nationwide research co-operations funded by the German government.