

Modelling the Acceptance of Information Technology: System Trust, Ease of Use and Usefulness

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Abstract

Acceptance research of information technology focuses on elements relating to usage, system characteristics and task oriented functions. The present paper analyses the factors influencing user acceptance of information systems and uses multivariate analysis to develop a technology acceptance model. In co-operation with one of the largest bank-group in Europe, the model was tested on a bank risk management system in a representative study on acceptance of information systems. The end result proved to be a statistically significant model which was of direct practical relevance.

1 Background

An analysis of the relevant scientific journals reveals that the word ‘acceptance’ is now commonly used as a summary term to describe a certain type of (use) behaviour [VeDa00; GoRe00]. Whether information technology is successful or not depends to a large extent on the level and kind of user acceptance it calls forth. This implies that a change is needed from the typical Yes/No dichotomy found in classical acceptance theory to a more dynamic approach. Thus, attempts are currently underway to treat acceptance as a form of use continuum. Along such a continuum, a tendency to high usage is interpreted as indicating high acceptance, while a tendency to low usage indicates low acceptance. Following this approach, the term acceptance is used in the present paper to refer to a recurrent decision on the part of an individual to make frequent task-based use of an information system (IS). Normally, problems of acceptance express themselves in the shape of staff indifference or neglect or in staff making insufficient use of the information technology. In such circumstances, user expectations with regard to the application of the information technology in performing specific tasks are hardly likely to make themselves felt.

It is the intention in the present paper to examine those factors which exert the greatest influence on the acceptance of IS (see also [Milc02]). Previous work in this area has tended to focus on two major determinants: user friendliness of the system and the quality of the information provided. However, with respect to describing the acceptance levels found for new IS, the explanatory power of these two variables has not been suf-

ficiently high. The present paper therefore attempts to extend the above approach by describing empirical tests of a newly developed technology acceptance model (TAM). The research study focussed on acceptance levels relating to the use of an IS where tasks were well defined and were not subject to high changes in frequency. These tasks, and others like them, such as the production of standard reports, represent essential areas of activity in management information systems.

Scientists engaged in the field of management information systems approach user acceptance research on the basis of theories used in social psychology. This theoretical foundation is applied by Davis [Davi86] to concrete applications in IS. In his analysis of the TAM he assumes that user acceptance of an IS depends on 'intention to use', i.e. the user's intention to make continued use of the system in future. This intention is influenced by the user's attitude towards the IS and the system's perceived usefulness, i.e. the extent to which the system is perceived as helpful in the performance of specific tasks. In addition to usefulness, the concept of perceived ease of use is also considered to be an explanatory variable in user acceptance, and this serves to capture the potential reduction of effort that a user might expect to gain by using the system. User acceptance is also influenced in an indirect manner by further external factors such as the organizational procedures used in the implementation of IS.

Davis et al. [DaBa89] subsequently subjected the model to empirical testing and came to the conclusion that the original TAM was only partly supported by statistical results. Empirical test results diverged from the theoretical model owing to the fact that the components 'attitude toward using' and 'external variables' were not taken into consideration. These were ignored since they do not make a significant contribution to an explanation of the model (see here [RoHe00, 441; VeDa00, 195]). The low significance of the construct 'external variables' in the TAM is of particular interest here since in other studies it was seen to be a necessary element in the implementation of IS. It needs to be said, however, that these studies were based on different underlying assumptions. The results of the investigation undertaken by Davis et al., confirm that the construct 'intention to use' is the most important factor in explaining user acceptance behaviour.

2 Research Objectives and Concepts

The main objective of the present study is to investigate the most important factors influencing IS acceptance. This is done by means of a hypothesised causal model specially developed for the purpose, which makes use of a new component, SYSTEM TRUST. The explanatory power of this new component in the acceptance model is then tested statistically. Empirical testing of the acceptance model was carried out on the basis of a parent population of 1200 bank employees in Germany, working for the 'Bayerischen Hypovereinsbank' (HVB-group). These employees were targeted as part of a recent corporate effort to strengthen the use of IS in the processing of credit information. All these employees, those dealing with private as well as those dealing with corporate accounts, had access to a personal computer with an Internet connection.

Methodological procedure was broken down into preliminary, main and post research activity. Preliminary and post research each entailed the carrying out of 58 personal interviews. For the main research activity, which took place in the period 20.06. – 31.08.2000, an intranet questionnaire, linked to an Excel databank was chosen as survey

method. The questionnaire used an ordinal scale and was connected to the starting page of the IS by means of a hyperlink. This IS was used throughout the HVB-group. An accompanying text was also provided in order to motivate employee response to the survey. Data analysis was carried out using the SPSS statistics package (SPSS Inc., Chicago, IL).

3 Model Components

The factors investigated in the user acceptance model presented here are taken to be the most important variables in determining user acceptance of IS. In the coming sections, the model constructs are described with reference to user acceptance, and their significance with respect to IS use is shown. Owing to their relatively high explanatory power in user acceptance problems, special attention is paid to the two factors SYSTEM TRUST and EASE OF USE.

3.1 System Trust

It was not possible to fall back on existing or previously tested data to aid in the description of the concept SYSTEM TRUST since it was devised specifically for the present study. Variables were derived purely on the basis of theoretical considerations.

Traditional research on the concept of trust tends to focus on the interpersonal aspects of trust formation [Luhm88]. Although, the formation of trust is heavily dependent on the closeness of the agents involved, 'system trust' can arise even when dealing with strangers [MaSk98; DyCh00] or with electronic systems. The problem of trust development in relation to IS has only recently been the subject of attention in the literature, and even then, only briefly. The main focus has been on the problem of technical security in electronic markets [Ratn98; Reag96]. Within such a setting, it is not possible to deal adequately with problems relating to research interests in information science.

One important variable which is used in the operationalization of the construct SYSTEM TRUST is 'understandability' with respect to the task at hand. User trust in an IS is augmented when the instructions given for the completion of a specific task are lucid, intelligible, and fathomable – in short, understandable. The term instructions, is used here to refer to specific procedural rules which communicate company policy to the user. This was made clear by Ackoff many years ago when he stated that complex decision making processes require corresponding decisional rules [Acko67, 150]. Merely providing naked information without supplying instructions for its use can never be seen as an adequate aid for decision making.

Ye/Johnson describe the different types of information which strengthen user trust in an IS [YeJo95]. Information types which serve to justify a certain procedure and define under what circumstances exceptions are to be made are particularly important for the user. Research confirms that such additional information supports the understandability of the instructions conveyed and thus enhances user acceptance.

The concept 'instructional relevance' is based on the assumption that SYSTEM TRUST is increased when the user is convinced of the relevance of the instructions or targets set.

As far as a pragmatic¹ understanding of information is concerned, the main requirement for information conveyed is that it be of situational relevance, i.e. relevant to the actual situation at hand.

3.2 Ease of Use

A further factor of importance in the TAM is the component EASE OF USE. This component is based on the assumption that a connection exists between the user friendliness and the user acceptance of an IS.

Several recommendations can be found in the literature with respect to IS design [Alte99]. The system should be designed so as to be user friendly and task relevant. This is the case when the IS is designed so as to support the user in the completion of a given task and the inherent characteristics of the IS do not impose unnecessary barriers. Basic prerequisites are well structured presentation and correspondingly well organized search possibilities, although it needs to be remembered that paying attention to the mere form of information presentation alone is not sufficient since a further crucial factor contributing to user acceptance is the provision of information in a suitable quantity and quality. The creation of informational value added thus has a crucial impact on user acceptance. Based on the concept of value chain as developed by Porter [Porte85] informational processes can be analysed beginning with initial stages of knowledge production and moving along to knowledge application, with the share of value added for each stage being ascertained. Of particular relevance for user acceptance is the user perception of value added. For example, IS create value added when individual operators increase their work efficiency. Such value added efficiencies enable existing tasks, e.g. gathering information for use in loan applications etc., to be performed more easily.

3.3 Usefulness

The factor USEFULNESS is an important determinant in the TAM. Empirical studies confirm the importance of this construct for user acceptance in IS [LeMa00; LiLu00]. It is assumed that there is a positive correlation between the quality of information provided and the level of user acceptance with respect to the IS [Gati94, 127]. The model component USEFULNESS is thus taken to refer to the significance of the IS as an aid to the general decision making process within the corporation.

On the basis of a meta-analysis covering 180 scientific studies, DeLone/MacLean identify the most important determinants for success in IS application [DeMc92]. They come to the conclusion that informational quality is an important success factor. All empirical studies confirm that the factor relevance is an important criterion for assessing the value of information provided in an IS.

In selecting indicators to be used in operationalizing the concept of informational quality it is essential that the objectives of the IS under consideration be explicitly accounted for. As mentioned earlier, the main purpose of management information systems lies in the provision of information which is helpful in fulfilling well structured tasks which are not subject to frequent change. The focus on the aspect of informational relevance

¹ There are numerous publications dealing with the concept 'information'. A technical perspective tends to dominate in classical information theory [ShaWe49]. However, the approach used here focuses specifically on the practical relevance of information.

complies with the results of empirical research in TAM [LeMa00]. Informational relevance is therefore used as the main indicator for the model component USEFULNESS.

3.4 Intention to Use

In TAM research, user acceptance of an IS is measured in terms of whether people repeatedly decide to make frequent use of a system or not. The construct INTENTION TO USE is thus understood to refer to the intention of the user to make future use of the system. In present TAM research, mostly the post-implementation phase is used as the basis for analysing acceptance levels. It is also becoming more common in such research to place more emphasis on the construct 'intention to use', and to downplay the importance of the factor 'actual system use' [Math91, 186]. Such an approach has been extensively supported by the results of empirical research. For example Venkatesh/Davis [VeDa00, 197] have found a strong connection between the constructs 'intention to use' and 'actual system usage'. The strong empirical basis for the connection between 'intention to use' and 'actual system usage' thus validates the current focus of attention in acceptance research. The following variables are used to describe the model construct: frequency of system use in the completion of specific tasks, intended future frequency of use of the IS, and the future importance of the IS in the basic provision of information.

4 Model Construction

In empirical research on user acceptance of IS the main focus of analysis is on user friendliness and the usefulness of the IS. However, the explanatory power of these factors with respect to user acceptance levels is not sufficient. Therefore the model of user acceptance developed in the present study introduces an additional model component, SYSTEM TRUST. It is assumed here that on the one hand, SYSTEM TRUST acts as an intermediate variable in IS acceptance, and on the other hand that it exerts a direct influence on future use of the IS.

Hypotheses were then formulated with respect to the relations depicted and tested at a 5% significance level.

Hypothesis 1: EASE OF USE has a significant effect on user trust in the information system (SYSTEM TRUST).

Hypothesis 2a: EASE OF USE has a significant effect on the USEFULNESS of the information system.

Hypothesis 2b: User trust in the information system (SYSTEM TRUST) has a significant effect on the USEFULNESS of the information system.

Hypothesis 3a: EASE OF USE has a significant effect on INTENTION TO USE in the information system.

Hypothesis 3b: USEFULNESS has a significant effect on INTENTION TO USE in the information system.

Hypothesis 3c: SYSTEM TRUST has a significant effect on INTENTION TO USE in an information system.

These hypotheses were then tested in an empirical study of a bank risk management system.

5 Information Systems in Bank Risk Management

Bank risk management procedure comprises identification and quantification of typical risks facing the bank as well as the management and direction of such risks by corporate headquarters.

Once the general framework of competencies has been set out by the bank board of directors, risk management policy at the HVB becomes a relatively independent and decentralized matter. The focus is on the development and setting of business targets (e.g. defining the principles of credit risk policy), constant evaluation of current risks and the maintenance of the requisite information flows. The IS in use at the HVB are based on structured blocks of information which are needed in monitoring and communicating bank credit policy. Customers are assigned to a specific credit worthiness class on the basis of their individual circumstances and the relevant business sector reports. Systems for risk management are continually being updated in order to improve their function as early warning indicators. On completion of the general overhaul of the business information system, 'Kobra', in February 2000 (the system analysed here), customer management procedures in the HVB, based on industry and business branch, were implemented on a corporate scale. Information collection (sourcing and archiving) and information processing (credit processing and customer relations) became part of the main risk management function. The Kobra IS now functions as an aid in corporate credit risk policy. Of great importance here is its use in the dissemination of binding instructions or guidelines which are used to inform employees of bank credit policy.

The content of the Kobra business reports is continually evaluated and updated by the employees of the business information centre, who may specialize in the analysis of a specific sector or theme. Information is sorted in terms of category headings such as 'Market', 'Competition', 'Rating/Control' and 'Sector standards'. For each of these, additional managers and/or senior risk managers are employed who possess even more specialised knowledge. This specialist knowledge is used in the risk assessment and management of the bank's portfolio. Over 130 industry reports and approximately 2000 charts and tables are used for supplying sector specific information throughout the corporation. Information may be retrieved on the basis of industry code, full-text or keyword search, full report, charts, tables or industry group. Each industry report can be assembled rapidly and contains information categorized according to the following five headings:

- 'Overview': provides a short summary of the two areas 'Market' and 'Competition' and in addition offers explanations of industry-specific terminology.
- 'Market': provides information on market size and growth rates and analysis the factors underlying market development. A five-year market forecast based on this information is also possible, with important market segments also being taken into account.
- 'Competition': covers basic information relating to competitive strategies of individual companies and provides an overview of the market leader. The analysis of strategy impact on competitive position is also presented. On the basis of cost, price and profit structure, the risk of insolvency in the sector can also be estimated.
- 'Rating/Control': supplies risk assessment information for a particular sector over the mid-term and provides related ranking information. This information is drawn up by the bank's analysts, and is considered independently of any potential impact on the bank's credit portfolio. Binding rules on credit business are then supplied by the senior risk managers. This involves the use of simple signalling devices for retail and business cli-

ents. Additional information and rules covering exemptions or exceptions are available in all sector reports. The person responsible for providing credit facilities is thus obliged to comply with Kobra regulations.

- 'Sector Standards': here, procedural rules on processing credit applications are given by senior risk managers. These industry standards are binding for the analysis of credit worthiness. A central element under this heading, is the provision of key industry information, financial and otherwise, in order to facilitate evaluation procedures.

6 Results of Analysis

A total of 542 employees responded to questionnaires, 283 from private client business, and 211 from the bank's business client sector. The remaining 48 replies were from the real estate business and other areas of bank activity. The total response rate amounted to 45.2%. The results of factor analysis and path analysis are presented in the following sector. On the basis of factor analysis, hypotheses can then be tested using path analysis. This allows for the investigation of causal dependencies between specific characteristics. The analysis is based on the 494 replies from employees in the retail and business activities.

6.1 Factor Analysis

The purpose of factor analysis is to identify those independent determinants which can be separated out from the many possible variables present, in order to reduce analysis to a manageable quantity of data based on the most essential factors. To this end, it is necessary to identify those factors which best explain the observed relations among the given variables. Variables are assigned to those factors where they reach the highest load value. In the present case, factor loading values greater than 1 were considered relevant. The Varimax method (orthogonal rotation) was used for the extraction of principle components, with eigen-values > 1 . A summary term is used to help interpret variables producing a high load value on a factor. The four model constructs can be designated as USEFULNESS, INTENTION TO USE, EASE OF USE and SYSTEM TRUST. The high loadings achieved in the factor analysis lend support to the theoretical underpinnings of the model components (see table 1).

Items	Factor 1 USEFULNESS	Factor 2 INTENTION TO USE	Factor 3 EASE OF USE	Factor 4 SYSTEM- TRUST
Relevance 'Market'	0,76			
Relevance 'Competition'	0,75			
Significance to the credit decision making processes	0,68			
Relevance 'Sector reports'	0,69			
Relevance 'Overview'	0,47			
Frequency of system use prior to credit application		0,74		
Intended future frequency of system use		0,72		
Frequency of system use prior to customer		0,63		
Future importance of the system		0,54		
Structure of sector reports			0,76	
Information search options			0,71	
Completeness of the sector reports			0,53	
Work load relief in information gathering			0,49	
Specialised knowledge of the analysts			0,45	
Relevance 'Rating/Control'				0,75
Understandability of the procedural rules				0,71
Relevance 'Sector Standards'				0,62
Eigen-value	5,37	1,67	1,21	1,12
Variance (%)	31,6	9,8	7,1	6,6

Table 1: Factor Analysis

The factor USEFULNESS is determined by variables which reflect the significance of the information provided as a general decision making aid in credit procedures. In terms of factor loadings, two factors achieved particularly high values here, 'Market' and 'Competition'. The factor loading for the heading 'Overview' is less pronounced.

The model construct INTENTION TO USE is heavily dependent on the frequency of credit applications. The user's intention to use the IS in future is thus strongly influenced by the frequency of system use prior to credit application. Variables such as 'Intended future use' or 'Use prior to customer' also exhibit high factor loading values.

The factor EASE OF USE represents the degree of user friendliness in the IS and the perceived value added. The two most pronounced variables 'Structure of sector reports' and 'Information search options' may, in accordance with the findings in the literature, be interpreted as 'Ease of finding'. The other three variables, including for example, 'Work load relief in information gathering', reflect informational value added and efficiency effects.

The model component SYSTEM TRUST comprises variables which reflect user trust in the IS. The procedural rules given under the headings 'Rating/Control' and 'Sector Stan-

dards' are intended to impart concrete information to the user on bank credit policy. The factor loadings of the variables can be interpreted thus: the more understandable the rules or recommendations for the system user, the more likely he/she is to arrange credit in accordance with the procedural rules posted.

6.2 Path Analysis

Path analysis is a multivariate statistical procedure used to test for causal relationships among variables. The hypothesized causal model presented here derives from basic theoretical considerations. Relationships between the model constructs are expressed in terms of standardized coefficients (beta coefficients) and variance characteristics.

Hypothesis 1: The construct EASE OF USE has a significant effect on SYSTEM TRUST ($p < 0.001$ and $\beta = 0.44$). This path explains 19% of the variance in SYSTEM TRUST. The null hypothesis stated that EASE OF USE has no significant effect on user trust in the information system (SYSTEM TRUST) and is rejected.

Hypotheses 2a and 2b: The constructs EASE OF USE and SYSTEM TRUST have a significant effect on USEFULNESS ($p < 0.001$). The corresponding path coefficients were 0.48 and 0.25. They thus account for 37% of the variance observed.

Hypothesis 2a: The null hypothesis stated that EASE OF USE has no significant effect on USEFULNESS of the information system and is rejected.

Hypothesis 2b: The null hypothesis stated that SYSTEM TRUST has no significant effect on the USEFULNESS of the information system and is rejected.

Hypotheses 3a, 3b and 3c: The three constructs EASE OF USE, USEFULNESS and SYSTEM TRUST have a significant impact on INTENTION TO USE. With respect to their direct effect on INTENTION TO USE, the values achieved for EASE OF USE and USEFULNESS are almost identical ($p < 0.01$ and $\beta = 0.20$). The correlation between SYSTEM TRUST and INTENTION TO USE is less pronounced ($\beta = 0.13$ with $p < 0.05$). The three paths explain 20% of the variance. The percentage of variance explained in other TAM research studies is not so high. For example, Lederer et al. obtain a value of 15% [LeMa00, 275].

Hypothesis 3a: The null hypothesis stated that EASE OF USE has no significant effect on INTENTION TO USE in the information system and is rejected.

Hypothesis 3b: The null hypothesis stated that USEFULNESS has no significant effect on INTENTION TO USE in the information system and is rejected.

Hypothesis 3c: The null hypothesis stated that SYSTEM TRUST has no significant effect on INTENTION TO USE in an information system and is rejected.

The model includes direct and indirect effects between the constructs. Indirect effects result when the impact of a particular variable on another is felt through one or more intermediate variables [Davi93, 482]. A comparison of model parameters shows that the connection between EASE OF USE and SYSTEM TRUST and that between SYSTEM TRUST and USEFULNESS are of a similar strength. This indicates the significance of SYSTEM TRUST as an intermediate explanatory variable in the user acceptance model.

7 Practical implications

The study led directly to concrete results in practice. Staff numbers in the relevant bank department (at the HVB-group) were increased considerably and study results were drawn on in order to implement specific system improvements. A complete re-organization of IS support in business sector analysis was undertaken. Among other things, this included a more specific and differential approach in the description of those markets in which the bank intends to expand quickly (target sectors), a more pronounced orientation towards those sectors of high importance in the bank's portfolio (core industries), more intense analysis of industry reports, and with respect to relatively large loan arrangements, a stronger emphasis on individual customer analysis. The results of the empirical research thus led directly to considerable improvements in the practical operation of the information system.

8 Summary and Conclusions

The testing of six basic hypotheses forms the focal point of the study. At first the theoretical reasoning behind the new variable SYSTEM TRUST and the other constructs EASE OF USE, USEFULNESS and INTENTION TO USE is explained and their interrelations clarified. Factor analysis is used for empirical validation of the model constructs. The high factor loadings resulting from the analysis support the model. The testing of the core hypotheses involves investigating whether the model constructs exert a significant impact on each other. Path analysis is used to assess the explanatory power of the proposed user acceptance model and to identify the relationships between the various elements. As postulated in hypothesis 1, the effect of the construct EASE OF USE on SYSTEM TRUST is found to be statistically significant. With respect to hypotheses 2a and 2b, the impact of EASE OF USE and SYSTEM TRUST on USEFULNESS was also shown to be significant. Finally, the effects of the three components EASE OF USE, USEFULNESS and SYSTEM TRUST on the dependent variable INTENTION TO USE, were all shown to be statistically significant (hypotheses 3a, 3b and 3c). An analysis of the direct and indirect effects existing between the constructs leads to the conclusion that the factors EASE OF USE and SYSTEM TRUST are the most important determinants in the proposed user acceptance model. A comparison of path coefficients highlights the significance of the new variable, SYSTEM TRUST, in the user acceptance model. The strong positive relationship between EASE OF USE and SYSTEM TRUST, and between SYSTEM TRUST and USEFULNESS, show the extension of the model to be a success. Multivariate analysis reveals that SYSTEM TRUST exerts both an important indirect effect on user acceptance of information systems, and a direct effect on intended future use of the system.

Literature

[Acko67]Ackoff R.L.: Management Misinformation Systems, in: Management Science, 14, 4, 1967, 147 - 156.

[Alte99]Alter S.: Information systems: a management perspective. Reading: Addison Wesley Longman, 1999.

[DaBa89]Davis F.D./Bagozzi R.P./Warshaw P.R.: User acceptance of computer technology: A comparison of two theoretical models, in: Management Science, 35, 8, 1989, 982 – 1003.

[Davi86]Davis F.D.: A technology acceptance model for empirically testing new end-user information systems: theory and results. Doctoral Dissertation, Sloan School of Management, MA, 1986.

- [Davi93]Davis F.D.: User acceptance of information technology: system characteristics, user perceptions and behavioral impacts, in: *Int.J.Man-Machine Studies*, 38, 1993, 475-487.
- [DeMc92]DeLone W./McLean E.: Information systems success: The Quest for the dependent variable, in: *Information Systems Research*, 3, 1, 1992, 60-95.
- [DyCh00]Dyer J.H./Chu W.: The determinants of trust in supplier-automaker relationships in the U.S., Japan, and Korea, in: *Journal of International Business Studies*, 31, 2, 2000, 259 – 285.
- [Gati94]Gatian A.: Is user satisfaction a valid measure of system effectiveness? In: *Information & Management*, 26, 1994, 119 – 131.
- [GoRe00]Govindarajulu C./Reithel B.J./Sethi V.: A model of end user attitudes and intentions toward alternative sources of support, in: *Information & Management*, 37, 2000, 77 – 86.
- [LeMa00]Lederer A./Maupin D.J./Sena M.P./Zhuang Y.: The technology acceptance model and the World Wide Web, in: *Decision Support System*, 29, 2000, 269-282.
- [LiLu00]Lin J.C.C./Lu H.: Towards an understanding of the behavioural intention to use a web site, in: *International Journal of Information Management*, 2000, 20, 3, 197-298.
- [Luhm88]Luhmann N.: Familiarity, confidence, trust: Problems and alternatives, in: Gambetta (Ed.): *Trust: Making and breaking cooperative relations*, 1988, 94-107.
- [MaSk98]Macy M.W./Skvoretz J.: The evolution of trust and cooperation between strangers: A computational model, in: *American Sociological Review*, 63, 1998, 638-660.
- [Math91]Mathieson K.: Predicting User Intentions : Comparing the technology acceptance model with the theory of planned behavior“, in: *Information Systems Research*, 2, 3, 1991, 173–191.
- [Milc02]Milchrahm E.: Entwicklung eines Modells zur Akzeptanzproblematik von Informationstechnologie, in: Hammwöhner, R./Wolff C./Womser-Hacker C. (Ed.): *Information und Mobilität - Optimierung und Vermeidung von Mobilität durch Information*, Proceedings des 8. Internationalen Symposiums für Informationswissenschaft, Konstanz: Univ.-Verl. Konstanz 2002, 27-44.
- [Porte85]Porter M.: *Competitive Advantage: Creating and Sustaining Superior Performance*. New York: The Free Press, 1985.
- [Ratn98]Ratnasingham P.: The importance of trust in electronic commerce, in: *Internet Research: Electronic Networking Applications and Policy*, 8, 4, 1998, 313-321.
- [Reag96]Reagle J. M.: Trust in electronic markets. In: *first monday*, 2, 1996, <http://www.firstmonday.org/issues/issue2/markets/index.html> (Version 10.1.00)
- [RoHe00]Roberts P./Hendersen R.: Information technology acceptance in a sample of government employees: a test of the technology acceptance model, in: *Interacting with computers*, 12, 2000, 427-443.
- [ShaWe49]Shannon C.E./WeaverW.: *The mathematical theory of communication*. University of Illinois, Urbana: Ill, 1949.
- [VeDa00]Venkatesh V./Davis F.D.: A theoretical extension of the technology acceptance model: four longitudinal field studies, in: *Management Science*, 46, 2, 2000, 186-203.
- [YeJo95]Ye L.R./Johnson P.E.: The impact of explanation facilities on user acceptance of expert systems advice, in: *MIS Quarterly*, June 1995, 157-172.