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## User Acceptance of Electronic Commerce: Contributions from the Bled eConference

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### Abstract

*User acceptance of electronic commerce continues to be a popular topic at the Bled eConference. The paper reviews the past contributions of the conference in this specific area. The review deals with those studies that have an empirical and quantitative component, and those studies where the emphasis has been on testing theories of user acceptance. The paper establishes three phases in which Bled delegates have gradually extended generic user acceptance models to deal with issues of electronic commerce. The first phase (2001-2003) is one of theory application. The second phase (2004-2007) is one of theory extension. In the third phase, (2008-2011), Bled delegates move beyond traditional models and adopt alternative theoretical approaches. The review ends with three promising avenues for further research in electronic commerce.*

**Keywords:** User Acceptance, Electronic Commerce, Bled eConference

## 1 Introduction

User acceptance of electronic commerce is a popular topic at the Bled eConference, and at the same time it is one of the most frequently recurring themes in information systems research. Arguably the theme returns so very often because electronic commerce itself keeps changing: new technologies and new software trigger changes in user behaviour, and each time such a change occurs, new challenges to user acceptance present themselves. The Bled eConference has certainly been witness to a rapid succession of new technologies: from early technologies that dealt with the exchange of structured messages between businesses in long-term relationships (Electronic Data Interchange, EDI) to full-blown e-business systems and mobile commerce. As a consequence, it is hardly surprising that many Bled delegates have exercised themselves with the user acceptance of these newly emerging technologies.

In this paper I will attempt to review the contributions of the Bled eConference in the area of user acceptance. The 25th anniversary of the conference is an opportune moment to consolidate the main findings and to reflect on what has been studied. I will also point towards several new avenues for future research, in the hope it may serve as some guidance for future Bled contributions.

In selecting the papers for the review, I have confined myself to those studies that have an empirical and quantitative component. I have limited myself further to those studies where the emphasis has been on testing theories of user acceptance. The rationale for selecting just those

studies is partly a matter of tractability. In addition, it is perhaps more meaningful to consolidate studies that adopt a shared research paradigm and a shared epistemological position. As a consequence, the review does not cover surveys of a more descriptive or interpretive nature (i.e., accounts or narratives on the usage of electronic commerce) and it does not cover surveys of electronic commerce stakeholders other than users (i.e., online auctioneers or online vendors). As it turns out, most of the qualifying studies use models that have something in common: their theoretical origins can be traced back to the Technology Acceptance Model, or TAM.

The TAM model hardly needs an introduction as it is well established in information system research. Introduced by Davis, Bagozzi, and Warshaw (1989) and Davis (1989), the model states that perceived usefulness and perceived ease of use jointly determine the user's behavioral intention to use the system. The model is an adaptation of the Theory of Reasoned Action (Ajzen & Fishbein, 1980), and most famous for its parsimony and explanatory power. TAM has been extended in many directions: examples include antecedents of perceived ease of use (Venkatesh & Davis, 1996; Venkatesh, 2000) and perceived usefulness (Venkatesh & Davis, 2000). The model has also been refined with moderating influences such as age and gender (Venkatesh, Morris, Davis, & Davis, 2003), and applied successfully in a diverse range of settings, including electronic commerce (Gefen, Karahanna, & Straub, 2003). The model spawned a vast base of literature (see Lee, Kozar, & Larsen, 2003, for an overview) and now enjoys almost iconic status.

The paper will follow a chronological structure, in which I hope to demonstrate the phases in which Bled delegates have gradually appropriated and extended the Technology Acceptance Model to deal with issues of electronic commerce. The first phase is one of application. This phase took place in the years of the dot-com bubble and shortly thereafter. In this phase researchers were coming to grips with the model and did so by applying it to the various technologies that emerged. The second phase is one of extension. This phase took place when the first excitement regarding the model subsided, and researchers began to take a more critical look at the model. In this phase, Bled delegates begin to propose major extensions to the model, notably in the area of trust and privacy, in order to accommodate some of the critical user acceptance aspects of electronic commerce. In the third phase, Bled delegates begin to move beyond TAM: they abandon the model in favour of other, competing approaches that address some of the deeper shortcomings of the TAM model that cannot be resolved by mere extension. Whilst recognising that these phases overlap, for clarity of exposition I have assigned the years 2001-2003 to the first phase, 2004-2007 to the second phase, and 2008-2011 to the third phase. Note that in the years before 2001, the emphasis of the Bled eConference was on the adoption of electronic commerce in business-to-business settings. Acceptance theories for individual users are not particularly useful for such business-to-business situations, and this is probably why these theories did not make their entrance any earlier than 2001.

## **2 2001-2003: Applying user acceptance models**

The first papers applying TAM to electronic commerce technologies started to appear at the Bled conference after the turn of the century. Two studies appeared in 2001. The first study (Tung, 2001) applied TAM to information kiosks in Singapore. A survey of kiosk users and non-users returned answers pertaining to the various aspects of the kiosks. The paper concludes that ease-of-use, security, convenience, and reliability of data are the most

important drivers of acceptance. The second study (van der Heijden, 2001) applied TAM to a popular website in the Netherlands. Respondents to an online survey returned answers pertaining to the usefulness, ease of use, and enjoyment provided by the website. The study established that perceived usefulness, ease-of-use, and enjoyment all contributed to user acceptance. In addition, the perceived visual attractiveness of the website contributed positively to all three antecedents.

The year 2003 saw further applications of the TAM model to electronic commerce software and technologies. Kurnia and Chien (2003) applied a revised version of TAM to online grocery shopping. They examine the suitability of the model using a survey of Australian potential online shoppers. Support for the core concepts (usefulness and ease-of-use) was found, and in addition to those concepts, the concept of “visibility” surfaced. This concept is defined as the degree to which others can be seen to use the technology. Pedersen and Nysveen (2003) used a revised version of TAM to understand the user acceptance of a mobile parking service in Norway. Such a service allows drivers to pay for parking by texting start and finish time to a central service. Arguing that mobile services are not necessarily used just for utilitarian (i.e., useful) motivations, they include another driver of user acceptance: self-expressiveness. This concept relates to the degree to which users use the service as a conversation cue to express themselves to others. Following a survey of trial users of the service, the authors find a strong connection between user self-expressiveness and user acceptance. Both studies thus point at the growing importance of significant others using the technology (sometimes called “subjective norms”).

Whilst these studies have examined aspects of the technology, other studies have looked at the different user categories, and studied whether some users in some category are more likely to accept technology than users in another. An obvious candidate category is age. There is some evidence that younger people are quicker to accept technology than older people. Sieber and Sabatier (2003) studied the attitudes of Spanish young people regarding the mobile Internet as compared to older people. They employed a mixed method approach involving qualitative and quantitative research (interviews followed up by an online survey). 156 young Spanish people participated in the interviews. The authors find that whilst young people consider themselves technology-savvy, they are less prone to use the Internet to learn about new technologies. Instead they appear to be more independent and less reliant on others in their use and appropriation of technology.

Anckar, Carlsson, and Walden (2003) present the findings of a comprehensive study on the main adoption barriers of mobile Internet. 487 Finnish respondents, drawn from a representative sample of the Finnish population, answer questions regarding the motivations behind accepting or avoiding mobile commerce. The three main benefits include enhanced communications features, the flexibility with respect to the user's location and the time of the day, and the convenience and handiness of small, wireless mobile devices. The main drawbacks to adoption included cost-related issues (high operating costs, high initial costs) and the limitations of the then-current technology (limited capacity of devices, slow connection and/or data transfer). Fogelgren-Pedersen, Andersen, and Jelbo (2003) tackle the same research question (adoption of the mobile Internet) but approach it from a qualitative perspective. The study asked 15 early-adopters of mobile Internet regarding their experiences. They find that, while the technology was perceived to be potentially useful, the three main drawbacks were: 1) usability of the form-factor (poor transmission speed, poor display capacity and inadequate keypads), 2) limited content, and 3) prohibitive pricing. These qualitative results corroborate the findings from Anckar et al. (2003).

2003 also saw the first papers looking at the importance of perceived risk with conducting transactions online - a factor that can be mitigated by trust in the vendor selling the products. Lui and Jamieson (2003) developed a revised version of TAM that integrated perceived risk as a core concept, and focused on the emergence of trust between buyer and seller to reduce this perceived risk. They identified a number of sources of trust - trust in the legal framework, trust in others (generally), trust in the abilities and integrity of the retailer, and trust in the technology. All types of trust contribute to an overall level of "trust", which reduces perceived risk, and subsequently increases intentions to transact. Lui and Jamieson (2003) found empirical support for their model in a survey of postgraduate students.

### **3 2004-2007: Extending user acceptance models**

The next year (2004) saw further development of the TAM model for the purposes of electronic commerce. Many Bled delegates now applied the TAM model and extended the model with crucial factors involving trust in the vendor as well concerns for privacy. Hassanein and Head (2004) examine the influence of product types on trust, perceived usefulness, perceived ease of use, and perceived enjoyment. The authors study the differences in online shopping experience between products that are tangible (such as books) and intangible (such as concert tickets). A mix of Canadian employees and graduate students participated in their study. The authors find that perceived usefulness was significantly higher for websites selling intangible products. Similarly, trust was significantly higher for websites selling intangible compared to tangible products. They explain this finding by pointing to the direction of instant gratification, i.e., consumers tend to receive intangible products in digital form immediately after they are purchased, which would increase the website's usefulness.

Verhagen, Tan, and Meents (2004) study the attitudes of users of online auctions. They examined the impact of four factors on such attitudes: institutional trust, party trust, institutional risk and party risk. Institutional trust reflects trust perceptions of the auctioneer, whereas party trust refers to the trustworthiness of the sellers at the auction. Similarly, institutional risk concerns the risks associated with the auctioneer, whereas party risk reflects impressions of the risks associated with the sellers. 457 actual users of a Dutch online auction were surveyed to test the model. The findings indicate that institutional trust and party trust both directly influence buyer's attitude towards purchasing on the online auction site, with party trust almost double the strength of institutional trust. Institutional risk has some significant negative influence but party risk does not. The results indicate the vital importance of trust in online buying: almost half of the variance in online buying was explained by trust factors.

Dinev and Hart (2004) examine a concern that has begun to crop up as a major impediment to using electronic commerce: privacy. The authors present two factors that influence the extent of this concern: Internet technical literacy and social awareness. Using a sample of 369 US online users, they show that the users who report technical literacy but less social awareness have reduced privacy concerns as compared to those who report less literacy and more social awareness. The authors explore aspects of privacy concerns further in a follow-up paper the year after (Dinev et al., 2005). In this paper they identify three interrelated factors that influence Internet use: justification for government security, government intrusion concerns, and general Internet privacy concerns. The first two factors reflect the delicate balance between security and privacy: the extent to which users believe privacy intrusion by the government is justified in order to protect citizens. Interestingly, the authors study this

balance in two countries: Italy and the US. 889 US and 422 Italian online shoppers volunteered to participate in the study. The findings indicate different attitudes towards privacy and the role of the government in the two countries. With respect to government intrusion concerns, the Italian and US findings are in the opposite direction: the results suggest a strong negative relationship for Italians but no relationship for US individuals. These findings point at country differences in the perceived balance between privacy and security, and as the authors note, this may possibly be a consequence of post 9/11 reverberations.

Hinz, Gerstmeier, Tafreschi, Enzmann, and Schneider (2007) study a related problem: the privacy concerns inherent to participation in customer loyalty programmes such as Airmiles. They break down the concern of privacy into four components: concerns regarding collection, unauthorized access, errors, and secondary use. 279 potential and actual participants of online loyalty programs in Germany participate in their study. Interestingly they find that actual participants in loyalty programs have a higher concern for privacy than those who are not currently participating in loyalty programs.

Loyalty towards the online store arrives as a new, important variable in user acceptance research. Swaid and Wigand (2007) establish the concept of e-service quality and their influence on intention to purchase and online loyalty. They decompose the concept of e-service quality into seven components: website design, website usability, information quality, service reliability, responsiveness, assurance, and personalisation. Testing the model using a survey of 370 online shoppers, the researchers find that these components have varying levels of influence on satisfaction with the online retailer. Satisfaction in turn has a positive effect on loyalty intentions.

The second phase of user acceptance extension is also characterised by growing dissatisfaction regarding the conceptualisations of user behaviour as well as the measurement of user attitudes. Two contributions in this phase aim to address these issues. Regarding the conceptualisation of user behaviour, Hooper and Zhou (2007) examine the categories of mobile phone usage. It is often said that this can be addictive or compulsive. They provide empirical evidence regarding the extent to which this is really the case. The authors survey Australian mobile phone users and asked them to categorise their phone usage into six types: dependent, voluntary, mandatory, addictive, compulsive, or habitual. Findings indicated that mobile phone usage was most prominently being reported as mandatory, voluntary or dependent behaviour, with the least support for it being addictive. An improvement towards measurement is proposed by Ogertschnig and van der Heijden (2004), who develop a short-form measure of attitude towards using mobile services. The measure, which is based on the HED/UT scale (Voss, Spangenberg, & Grohmann, 2003) contains two groups of questions: one based on the utilitarian value of the service, one based on the hedonic value of the service. The scale is developed in recognition of the fact that many mobile services are used for hedonic purposes, i.e., their use is not the means to fulfill a goal external to the interaction, but the interaction is the end-goal itself (van der Heijden, 2004).

In this extension phase of user acceptance research we can also witness an increasing preoccupation with the user acceptance (or rather non-acceptance) of mobile services. Carlsson, Hyvonen, Repo, and Walden (2005) examine a representative Finnish data set and ask themselves the question whether mobile services are used more heavily by those who have more advanced mobile phones. They found this to be the case, although at the same time even those users in the possession of advanced mobile phones did not take up mobile services

enthusiastically: the general profile appeared to be more of trial usage rather than regular usage. Whilst take up of text services was universal, other services were not nearly as popular. In a follow-up paper, Carlsson, Carlsson, Puhakainen, and Walden (2006) compare the usage statistics with the predictions of a number of experts. The experts point at promising applications of mobile gaming, a phenomenon now universal but at that time still in early stages of adoption.

Sharing the interest in acceptance of mobile services, Wehmeyer and Muller-Lankenau (2005) studied the user acceptance of different sorts of mobile couponing. Using conjoint analysis, they studied aspects of mobile couponing in a sample of 125 potential users of couponing. They found that although coupon services were generally well received, location-aware coupon alerts were not at all preferred. This somewhat surprising result may be attributed to the privacy risks that are associated with the collection of location information. Wehmeyer (2007) followed up the previous study with an examination of such mobile advertisement intrusiveness. Intrusiveness is a well-known concept in “traditional” advertising, and it is known to lead to advertisement avoidance and irritation. Using an online survey (325 respondents), the researcher examined the impact of the information content of the advertisement and the user situation when the advertisement is received on the attitude towards intrusion. The findings indicate that the stress level of the situation has a significant effect: intrusion is notably lower if the advertisement is received in a low-stress situation.

#### **4 2008-2011: Beyond user acceptance models**

From 2008 onwards we can see many Bled delegates moving beyond the Technology Acceptance Model and addressing aspects of user acceptance of electronic commerce that the TAM model does not completely address. These include the establishment of previously unknown areas of commerce such as downloadable content, social network sites like Facebook, and virtual worlds like Habbo.

Hill and Troshani (2009) study the user acceptance of downloadable ringtones amongst mobile phone users. 593 young Australian users of mobile phones were surveyed. The empirical evidence provides strong support for the role of perceived enjoyment and perceived usefulness. Limited additional support is provided for concepts such as personal innovativeness, enhanced image, and security. A similar study on downloadable content is presented by Makkonen, Halttunen, and Frank (2011), who examine the effects of gender, age, and income on the willingness to pay for music downloads. They survey 1447 Finnish online users, and their findings suggest a gender effect: women expressed a higher willingness to pay for both albums and tracks. Willingness to pay for tracks was also found to increase with age and income.

Bled delegates show an increasing interest in new electronic commerce environments, notably social network sites and virtual worlds. Privacy concerns continue to play a role in social networks, and many would argue that these issues are far from settled. Surveying 210 Finnish Facebook users, Tuunainen, Pitkanen, and Hovi (2009) find that more than 60% of users were not aware of certain Facebook privacy settings. A majority of respondents indicated they would change their privacy settings upon completion of the survey. The privacy concerns surrounding social network sites continue to be a major issue of concern for many users.

Mantymaki and Salo (2010) study the participation of users in the Habbo virtual world. Specifically, they examine the role of trust as conceptualised into two factors: integrity and benevolence of the staff operating the virtual world, and trust in the other users’ integrity. In

collaboration with the company operating the virtual world, they survey over 2000 users of Habbo. They find that perceived integrity of the users influences purchase intentions but not usage intentions. Perceived integrity of the staff influences both usage intentions and purchase intentions.

An exciting new development in this last phase of research on user acceptance of electronic commerce is that Bled delegates start to examine user acceptance in more isolated, laboratory-like settings. In those controlled settings, versions of electronic commerce prototypes can be developed, and by subtly changing those versions researchers can measure subsequent changes in user acceptance. Maass and Kowatsch (2008) offer a very good example of this new kind of research. They describe the development of a mobile decision support system to help with in-store product decisions, and then examine the suitability of the system in comparison with more traditional sales support environments. By varying aspects of the prototype they are able to identify which aspects of the variation are able to help with user acceptance and which are not.

In a similar fashion, Cocosila and Archer (2009) develop and test a mobile application for preventive health-care (a daily SMS reminder to take Vitamin C). The researchers investigate a sample of 50 participants who used the application daily for one month. Findings illustrate that both extrinsic and intrinsic motivation determine user acceptance of these applications. In addition, three different sources of perceived risk have differential negative effects on user acceptance (mainly psychological and privacy risks). Cocosila (2010) follows up the study with another application of SMS messages: sending daily encouragements for those wishing to quit smoking. 170 UK respondents complete the user acceptance survey that presents the application. Extrinsic motivation, intrinsic motivation, and five different sources of perceived risk are found to be influencing user acceptance of the mobile health application.

## **5 Discussion and conclusion**

In this last section of the review I would like to share a few observations on these contributions to user acceptance research, and provide some pointers towards fruitful avenues for future research.

One observation, hard to ignore with the benefit of hindsight, is that many drawbacks associated with early electronic commerce technologies have gradually disappeared from view. For example, key bottlenecks that researchers identified as early impediments to mobile commerce revolved around the awkwardness of the user interface: the difficulty of entering information using the telephone keypad, and the poor resolution and limited visual range of the screens. These problems have gradually gone away: user interfaces have steadily improved and tablet computing has emerged as a viable alternative to mobile and PC-based computing. Similarly, slow download speeds have become much less of an issue than they were 10 years ago. Technology has progressed to the extent that these concerns are no longer major drawbacks to the use of electronic commerce. There are of course still some serious technological issues, notably around download speed in some areas of the world.

The resolution of these technological drawbacks notwithstanding, many core drivers of user acceptance that have been identified throughout the years are still very relevant today. Whereas mobile phone models from the 80's are now met with derision, user acceptance models from the 80's are still met with some reverence. Perceived usefulness, enjoyment, and usability of the technology continue to be major drivers of acceptance. Subjective norms, trust in vendors and the resolution of privacy concerns are still necessary conditions for many users



to engage in electronic commerce. These factors crop up with every newly emerging technology, and researchers have steadily modified and improved user acceptance models such that they adequately represent behaviour around acceptance or rejection of technology.

This is not to say that user acceptance models such as the Technology Acceptance Model are without shortcomings. Indeed, many have become increasingly exasperated with the iconic status of the TAM model. For example, Benbasat and Barki (2007) question the lack of design-oriented (or “actionable”) interventions that the model accommodates, as well as the narrowly defined concept of usage. Straub and Burton-Jones (2007) argue that many TAM studies suffer from common method bias and the explanatory power of TAM may therefore be deceptive. In addition, there are other longstanding problems with perceptual measures, such as the tension between what people report they do and what they actually do, as well as the tension between what people actually do and what they like to see themselves do. To some extent the third phase of electronic commerce research is already beginning to address these shortcomings, and I would anticipate that this is where the future of user acceptance research is headed.

At least three avenues for further research in user acceptance would seem worthwhile. The first avenue is to do with actionable interventions. Such a focus on interventions can be achieved by incorporating actionable independent variables: those variables that are relatively easy to “adjust” by those who use electronic commerce technologies. Of course, many Bled contributions already focus on actionable interventions. Much research, however, has also focused on studying variables that do not fall into the “actionable” category. These include, for example, studies examining the influence of certain user characteristics such as age and gender. The practical recommendations that follow from these studies are normally restricted to a recalibration of the website’s audience; a recommendation that is not always easy to implement. Likewise, practical recommendations of some trust studies amount to “increase trust”; but this is not very actionable. These studies can perhaps be extended by actionable variables that vendors can adjust and manipulate, and thereby increase trust.

The second avenue of further research in user acceptance is the study of electronic commerce technologies in more controlled settings rather than simply studying technologies “in the wild”. The last stage of research already hinted at increased activity in this area. More broadly we can see this development as a shift towards increased internal validity (i.e., rigour), whilst at the same time attempting to preserve external validity (i.e., relevance). With more direct control over the shape of the electronic commerce technology itself, it is possible for researchers to study slight variations in these technologies and examine the resultant effect on user acceptance. Typically, these variations are also actionable as well as applicable to broader settings, thereby accommodating relevance to some extent.

A third avenue of further research is in the increased application of experiments in user acceptance research. Past research used in the main the survey approach, which, in the main, measures independent variables (such as perceived usefulness) and dependent variables (such as intentions to transact) at the same time. Experimental designs have the advantage that dependent variables are studied after the independent variables have been manipulated, which, in combination with randomisation of treatments, results in much stronger evidence of cause-effect relationships, and much stronger recommendations. This third strand of research is entirely compatible with movements towards actionable research and towards the employment of more controlled e-commerce settings.

It is a common experience of many providers of electronic commerce that user acceptance is by no means a given, even despite well-articulated benefits. At the early stages of the adoption cycle, it is not unusual to see many new technologies struggling to gain mass acceptance. Throughout the last 25 years, Bled conference delegates have systematically collected a wide inventory of factors that lead to, or inhibit, user acceptance. I am confident that in the next 25 years we will see an even further refinement of these models, such that even stronger practical recommendations will ensue.

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