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Adoption of Municipal e-Government Services – A Communication Problem?

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ABSTRACT

Although, e-government offers citizens various advantages, the usage rates still lag behind their potentials. Many studies have analysed factors influencing the e-government adoption, however, neglecting the aspect of communication as one crucial antecedent for intention to use. This study tries to close this gap by investigating the role of communication in the acceptance of e-government. We conducted a survey with 103 citizens in a medium-sized municipality. Results reveal that both user and non-users of e-government services would like governments to provide more information especially on the existence of services, the benefits as well as privacy and data security. We found strong support for users having used e-government services once to be very likely to use them again. We encourage governments to adjust their communication strategy to citizens' needs and provide further information on e-government especially via the governments' website.

Keywords

E-government adoption, Diffusion of Innovations, TAM, communication

INTRODUCTION

E-government, meaning the use of "tools and systems made possible by Information and Communication Technologies to provide better public services" (European Commission, 2011), promises various advantages for citizens. However, studies show that in contrast to its neighbouring domains, e-commerce and e-banking, the acceptance of the services offered by public administrations is still rather low. (Akkaya, Wolf and Krcmar, 2010) Thus, the services are neither able to save costs nor to increase the government's efficiency. (Chong, Ooi, Lin and Tan, 2010) The e-government research community has acknowledged this problem and has long since been analysing the criteria that drive the adoption of e-government services. Literature identifies three main factors that hinder the adoption of these offers. On the one hand, citizens often do not know which e-government services actually exist unless they actively search for them. (TNS Infratest, 2011) Furthermore, citizens are concerned with privacy issues and data security when using e-government systems. And finally, people often do not see the benefit of conducting their transactions with the administration online, i.e. they do not understand how those systems could be useful for them.

Many authors mention communication as a way of overcoming these barriers. (Bélanger and Carter, 2008; Bhattacherjee and Sanford, 2006; Chan, Thong, Venkatesh, Brown, Hu, and Tam, 2010) However, according to our best knowledge, up to now, there has been no study analysing the role of communication in the process of e-government adoption. Therefore, we address this gap in trying to answer the questions: *Does an insufficient communication between government and citizens cause a lacking acceptance of e-government services? Can an improved communication increase the use of e-government services?* In order to answer these questions, we conducted a survey with 103 participants in a medium-sized city in Germany on their intention to use local e-government services. We refer do Davis' Technology Acceptance Model (Davis, 1985) and Rogers' Diffusion of Innovation Theory (Rogers, 2003) for deriving our hypotheses.

The remainder of this article is organised as follows. In the next section, we give an overview of the current state of acceptance research in e-government as well as briefly present the Technology Acceptance Model and the Diffusion of Innovations Theory, upon which we then base our hypotheses. Section 3 contains our research setting. In Section 4, we present our results, which are afterwards interpreted in the following section. The article concludes with a summary as well as with the limitations of our study and implications for both governments as well as future research in the field of e-government acceptance.

CONCEPTUAL DEVELOPMENT

In the following section, we will present the Technology Acceptance Model (TAM) as representative for technology adoption research in the field of e-government, analyse the most significant factors that drive e-government adoption and depict the

Diffusion of Innovations Theory (DOI) to underpin the role of communication in the process of using e-government. Finally our hypotheses on the influence of communication on e-government adoption will be derived.

Measuring Technology Acceptance

The Technology Acceptance Model (TAM) is one of the most applied theories when it comes to analysing the adoption of e-government. Bhattacherjee and Sanford (2006), Carter and Bélanger (2005), Lee and Rao (2009), Sipior, Ward and Connolly (2011), Stafford and Turan (2011) or Yao and Murphy (2007) for example have used TAM to investigate the factors influencing citizens' and employees' adoption of e-government services. Davis identified two core factors which influence a user's acceptance of a technology. These factors are perceived usefulness, "the degree to which an individual believes that using a particular system would enhance his or her job performance", as well as perceived ease of use, "the degree to which an individual believes that using a particular system would be free of physical and mental effort" (Davis, 1985). Both perceived usefulness and perceived ease of use directly influence an individual's attitude towards using a system. Meanwhile perceived ease of use also influences the perceived usefulness. Given that all other factors remain unchanged, a higher perceived ease of use (compared to an alternative) will also induce a more efficient use of the technology and will thus increase the perceived usefulness. (Davis, 1985) On the other hand, studies have shown that the perceived usefulness is more important than the perceived ease of use. (Davis, 1989) In other words, regardless of how user friendly a system is, as long as it does not create any additional value for the potential users, they will not use it. The actual system use depends on the behavioral intention to use which in turn is influenced by the above mentioned attitude towards using.

Despite its major flaws like treating its antecedents as "black boxes" (Benbasat and Barki, 2007), TAM is often used because of its simplicity as well as of the abundance of existing items for measuring TAM's constructs.

E-Government Adoption Factors

Although, e-government promises advantages in terms of better services, many citizens are still reluctant to use the electronic offers. Previous research shows that – despite the missing possibility to access such services – there are three main reasons that hinder the use of e-government. One of the most important prerequisite for citizens using electronic services offered by the government is to actually *know that they exist* (OECD, 2009). Studies show that, for example in Germany, only 40% of the population is aware that they can use e-government services (TNS Infratest, 2011). A study conducted by the OECD revealed similar results for its member states. (OECD, 2009) Here too missing awareness of e-government was shown to be one of the highest barriers for its use.

A second important factor influencing the use of e-government is *security concerns*. Studies analysing the adoption of e-banking services reveal that such doubts about secure transactions regularly restrain the acceptance of these services. (Chen and Barnes, 2007; Chong et al., 2010) These concerns go along with the development of nowadays more and more personal information being available on the internet, part of which is publicly accessible. On the one hand, this information can be misemployed by third parties to support decision making concerning job employment or credit granting based on personal profiles (Solove, 2005). On the other hand, illegal deals with information on the internet are flourishing (Featherman, Miyazaki and Sprott, 2010; Salifu, 2008), and reports on data scandals and surveillance affairs are ubiquitous (Akkaya, Wolf and Krcmar, 2010). Maintaining and protecting one's own data is therefore becoming more important (Solove, 2005). However, meanwhile it is becoming harder to keep the overview and control. (Solove, 2006) This situation also influences the acceptance of online transactions like e-government. According to the eGovernment Monitor 2011, 87% of the questioned persons mentioned privacy and data security as an important criterion for e-government services, which is an increase by 5 percentage points since 2011. (TNS Infratest, 2011)

As described in Davis' Technology Acceptance Model, the *perceived usefulness* is a crucial influencing factor both on the attitude towards using a systems as well as the intention to use this system. This perceived added value of the system is an important condition for the actual use of information systems (Davis, 1985) and thus for the acceptance of e-government. Studies in the domain of online banking show similar results. Within their analysis in Vietnam, Chong et al. (2010) found out that a system is used when it creates an additional benefit for a user. Thus, the user has to spot a personal advantage in the new technology compared to the 'traditional procedures'. This perceived usefulness in parts is so important that it can lead to users using a system despite its privacy deficiencies. Facebook and Googlemail, for instance, have millions of users in spite of being subject to several discussions on privacy concerns. (Kosta, Kalloniatis, Mitrou and Gritzalis, 2010) However, it is important to understand that both privacy and usefulness are the users' subjective perceptions and do not necessarily reflect reality (Davis, 1989). On the one hand, users might notice an advantage even though there is no objective benefit (Rogers, 2003). On the other hand, an actual existing value will not always be perceived by the users. Therefore, the advantage that a

user senses in using an application must not be seen as a characteristic of the system but will always depend on the respective user.

The Innovation Diffusion Theory by Rogers also acknowledges the role of perceived usefulness respectively the 'relative advantage' in the acceptance of new systems. It is even seen as the strongest sign for the degree of adoption. The benefit is defined as the ratio between the expected advantages and the costs related to the adoption (Rogers, 2003). Only in case this ratio is positive, a potential user will accept an innovation and use it.

Diffusion of Innovations Theory

The Diffusion of Innovations Theory assumes a five stages model for adopting or rejection an innovation. (Rogers, 2003) In the first phase, the *knowledge* stage, a potential user hears about an innovation and gathers a first impression of the way it works. This stage is influenced by the user's communication behaviour. In general, this behaviour is stronger for those persons that know about an innovation early than for those who learn about it later. The second stage, the *persuasion* stage, is characterised by an individual forming his first opinion (be it positive or negative) towards the innovation. For this purpose, people actively search for information and interpret them. An importing factor is the relative advantage of the innovation (which represents the perceived usefulness in Davis' TAM) in comparison to its alternatives. In the following *decision* phase, the potential user makes a decision on whether to adopt or reject the innovation. This decision is based on the opinion formed in the persuasion phase. To this end, the innovation is subject to a first test if possible. The subsequent *implementation* stage deals with the question whether the user will continue adopting and using the innovation or whether he will stop after having tested it. In this phase, the previous theoretical considerations and decisions are implemented or rejected. It becomes obvious that the decision to use an innovation does not necessarily lead to its usage. *Confirmation* is the final phase. It is characterised by searching for approval after having adopted the innovation. The person actively searches for information to support his decision. This stage, too, ends with a decision: If the user mainly finds information that contradicts a further use, he might rethink the decision. However, if the decision is confirmed, the innovation will eventually be accepted. (Rogers, 2003)

Model of Communication in E-Government Adoption

Identifying and analysing the influencing factors of e-government adoption has not proven to be sufficient in terms of increasing the usage rate of the services. Based on the literature, we derived three hypotheses which assume an important role for communication in the adoption process of e-government. Many studies emphasise the importance for government to communicate with its citizens. However, to the best of our knowledge, so far, no study has ever incorporated the aspect of communication into their research. Chan et al. (2010), for example, recommend to more actively promoting e-government services in order to increase the citizens' awareness for these services. Bélanger and Carter (2008) underline the importance of communicating the government's ability to cope with privacy and data security in order to confront security concerns. Emphasising the importance to provide information on the benefits of e-government services, Bhattacherjee and Sanford (2006) refer to citizens who do not sense the added value or do not perceive the usefulness of an e-government system.

Communication between government and citizens seems to play an important role. However, this aspect is often neglected both in research and in practice. In order to understand the influence of communication, our research questions are:

RQ1: Does an insufficient communication between government and citizens cause a lacking acceptance of e-government services?

RQ2: Can an improved communication increase the use of e-government services?

The Diffusion of Innovations Theory shows that the information a potential user receives has an immense effect on the acceptance and that it is even seen as one of the main influencing factors. (Pfeffermann, 2010) Rogers describes the process as a search for information and its processing, in order to counteract unknown consequences that could occur due to using the innovation. In the first stage, it is therefore important for individuals to learn about the innovation. (Rogers, 2003) With regard to the e-government acceptance this means that users need to know about the existence of these services in order to use them. Announcements and marketing are therefore essential. In stage two, the persuasion phase, the user actively searches for information in order to form his opinion. Thereby, the usefulness and information on the security of these services play a crucial role. Stages three and four deal with decisions based on the previously gathered information as well as the implementation of these decisions. In stage five, the focus again lies on searching for information that an individual will use for supporting or rejecting his decision. Also, the marketing literature has acknowledged the role of information and communication on the user acceptance (Sandberg, 2002). Preparing the market for an innovation is essential in order to influence potential consumers and create acceptance. During this preparation stage, "awareness building" as well as "customer education" (Sandberg, 2002) shall take place. This leads us to the following assumption:

Hypothesis 1: More information, especially on the existence, data security and benefit of e-government services will increase the probability for citizens trying them at least once.

Communication can occur in various forms and via different channels leading to different effects on its audience. Therefore, it is important to understand how a successful communication should look like and how information on e-government shall be distributed to the citizens. A ubiquitous form of communication in the private sector is marketing. Marketing is seen as an adequate way of communicating innovations. When diffusing an innovation, this process should be supported by suitable promotion. (Sandberg, 2002) Marketing can occur in different forms like in traditional print media (newspapers, magazines etc.), broadcast or television, external promotion sites like posters, online promotion via websites or direct communication. According to Rogers and Shoemaker, these different forms of marketing can be assigned to the different stages of the Innovation Decision Model (Rogers and Shoemaker, 1971). Mass media reaching many consumers (i.e. via broadcast, print media, internet and stationary marketing) are more adequate for mere information, i.e. during the knowledge phase. Interpersonal media, on the other hand (i.e. direct face-to-face contact and direct communication), are suitable for influencing, i.e. during the phase of persuasion. As one of the main problems of e-government is the lacking knowledge about its existence, it can be assumed that the largest effect will be gained by mass media. Therefore we suppose:

Hypothesis 2: Communication of e-government services via mass media, especially via posters, flyers and newspapers positively influence the acceptance of the services.

Hypotheses 1 and 2 mainly deal with citizens that have not used e-government services before. According to the Innovation Decision Process, however, using an innovation once does not mean its eventual adoption. The acceptance has to be confirmed before one can refer to it as a real adoption. (Rogers, 2003) Assuming that these people are at least in the implementation phase of the Innovation Decision Process, the actual adoption only depends on whether they confirm their decision. E-government studies have shown that the majority of people who have already used the services were satisfied with them (TNS Infratest, 2011). This indicates that it is mainly important to convince the citizens to at least try the services once:

Hypothesis 3: Citizens who have already used the e-government services are likely to use them again in the futures. This means that for increasing the e-government acceptance, citizens have to be encouraged to try these services at least once.

RESEARCH METHODOLOGY

In order to test our hypotheses, we developed a semi-standardised questionnaire, which was distributed to citizens of a medium-size city in the west of Germany. People waiting in the main municipal office and in a branch office were asked to fill out the survey while they were waiting to be served. Completing the questionnaire took about eight minutes. It consisted of closed questions with a six point scale, choice questions as well as a few open text and rating questions. We chose the method of a questionnaire in written form as it makes it possible to gather a large amount of opinions with relatively few personnel. Furthermore it can be assumed that in contrast to interviewing methods, on average sensitive questions will be answered more honestly as the interviewees stay rather anonymous. (Brace, 2004) We pre-tested the questionnaire in different rounds in order to fix possible weaknesses and adjusted it accordingly.

We tested our assumption using descriptive statistics, which of course has some limitations. However, we see our questionnaire as a starting point for the topic of communication and e-government, which has to be refined in following studies in order to derive statistically significant results.

RESULTS

In total, we received 103 valid answers. 42% of the participants were male and 58% female, which roughly represents the structure of the sample city. 54.4% were between 20 and 20 years old, 22.3% between 30 and 39, 2.9% were 60 years or older and the remaining age groups were below 10%. However, this does not represent the structure of our sample city where in total 22% of the inhabitants are between 20-29 years old, a further 22% are 60 years or older and the age group of 30 to 39 is represented by 16%.

As one of our main aims of the study was to analyse how the e-government acceptance of non-users can be enhanced, we split our sample between users who had at least once tried e-government services and non-users. Participants in our questionnaire were rather firm with the internet. 80% acknowledged that they used the internet at least once per week. Regarding the online presence of the local government, however, only 50% have ever visited it and 30% did not even know it existed. The offered services have been used by about 30%. The most known and widely used services were information retrieval as well as downloading forms.

Within the group of users, 70% said that they were satisfied with the services and rated it on average 4.7 with a standard deviation of 1.26 on a 6-point scale. For the group of non-users, the mean is 3.3 with a standard deviation of 1.48. When asked whether their intention to use would increase if they were provided with better information, 44% of the users and 60% of the non-users agreed. Comparing the statements on the intention to use at the beginning of the questionnaire without information provision and at the end with the assumption that the desired information were provided, reveals similar results. Whereas for non-users the mean without information provision was 3.3 (for users 4.7), it increased to 4.1 (for users 5.1) when providing information.

In total, 73% of the users stated that they would like to have more information. 54% would wish for more information on the existence of e-government offers, 41% on the benefit, i.e. the usefulness, and 36% respectively 34% would like to have more information on data security and privacy. Only 20% mentioned further explanations on how to use the services as desired information. For the group of non-users, the results are similar: 57% mentioned information on the existence of e-government services, 37% on the benefit, 35% data security, 33% privacy and 19% instructions how to use the applications. When ranking the topics according to their importance, slightly different results occur. For both users and non-users, information on the existence of e-government services was the most important topic with 26%, followed by privacy (22%), data security (21%), benefits (18%) and information on the applications (13%).

Analysing the desired communication channels reveals that 53% of the participants would like to retrieve more information via the government's homepage, 28% would like to find information on the internet in general, 26% respectively 25% named posters and flyers in the municipal office respectively in the city, 23% would wish for more information by the government employees, as well as via the local newspapers and 11% would like to receive information via broadcast. Ranking the results shows that the preferred communication channel is the government's website (22%), followed by the internet in general (16%), information via the employees (15%), posters and flyers in the municipal office as well as in the city, announcements in local newspapers (all 13%) and broadcast (9%).

DISCUSSIONS AND IMPLICATIONS

As the sample is rather small, especially when splitting up between users and non-users, we cannot infer from our results to the general case. However, we believe to be able to show some tendencies. First of all, we can confirm that the e-government acceptance in our sample city is rather low with 36% ever having used the services and only about 50% knowing the government's website.

Increasing the Intention to Use by Providing Information

The results indicate a difference between users and non-users regarding the effect that more information has on the intention to use. The number of non-users is almost 1.4 times higher than the users believing that more information would increase their intention to use e-government services. Although one can expect that some of the users already have a high intention to use, for both groups there is a clear tendency to use these services when provided with more information. This leads to the assumption that one reason for the low acceptance rate is the lack of communication. Regarding the content of the desired information, it turned out that the focus is clearly on information on the existence of services. Therefore, it can be concluded that not only do users not use the services but they rather do not even know that they exist. Generally, it has shown that information has a positive influence on the intention to use e-government, which leads us to confirm our first hypothesis that *more information, especially on the existence, data security and additional value of e-government services, will increase the probability for citizens trying them at least once.*

Choosing the Right Communication Channel

In contrast to the question which information to provide, the choice for the best communication channel cannot be answered that easily. The preferred way of being informed on e-government services is the government's own website. Though, in doing so, the government can only reach those potential users who already know and use the online presence. Thus, this alternative alone does not provide a solution to the lacking acceptance. However, this channel can be used as a complement for other actions and provide detailed information on applications, their security and usefulness. Looking at the results reveals that other preferred channels are the internet in general as well as government employees thus contradicting the hypothesis' assumptions: *Communication of e-government services via mass media, especially via posters, flyers and newspapers positively influence the acceptance of the services.* In general, we found out that communication of e-government services does have a positive influence on the acceptance. However, the assumed channels do not seem to be the citizens' preferred ones. Detailed information on the services should be available on the government's website instead. Furthermore,

employees should inform citizens about the possibilities to use e-government and finally also the internet in general can be used as a communication channel for increasing the e-government acceptance.

Confirming Citizens' Choice to Use E-Government

Analysing the statements of those citizens having already used e-government services, shows that they are very likely to use them again in the future. Furthermore, a high level of satisfaction regarding the services could be observed. The services in general do not seem to represent obstacles towards usage. Therefore, our third hypothesis can be confirmed stating that *citizens who have already used the e-government services are likely to use them again in the futures. This means that for increasing the e-government acceptance, citizens have to be encouraged to try these services at least once.*

CONCLUSIONS

"Getting a new idea adopted, even when it has obvious advantages, is difficult" (Rogers, 2003). This also holds true for many local e-government services. Although, these services promise various advantages, only a small fraction of the population currently uses them. It was our aim in this study to find out whether the lacking e-government acceptance is caused by an insufficient communication between governments and citizens and whether an improved communication could increase the use of online services. The answer to this question is 'yes'. It has shown that citizens demand more information before deciding to actually use e-government services. In order to achieve this goal, the requested information should be provided via the government's website and by employees. Targeted communication is of special importance for informing citizens about the existence of services.

However, our research has some limitations. First of all, there is hardly any related work on the influence of communication on the acceptance process which we could build upon. Therefore, a lot of more and further improved studies are necessary to thoroughly tackle this field. Furthermore, our research sample has been rather small and thus our study has to be considered as research in progress. It would be helpful to conduct similar studies in municipalities that have a different population structure. Other theories on technology acceptance like UTAUT will probably provide more sophisticated insights in the factors influencing the acceptance and should therefore be considered for future research. A further extension of our model would be to include whether different types of e-government services require different channels and content of communication. What is more, the 'traditional' marketing channels that we considered in our study should be enriched by new channels like social media or internet advertisement. In addition, we are aware that a descriptive analysis does not provide any statistically significant results. However, we believe that our research is a valuable first step towards analysing the role that communication plays in the acceptance of e-government.

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