IDENTIFYING FACTORS OF E-GOVERNMENT ACCEPTANCE – A LITERATURE REVIEW

Completed Research Paper

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Abstract

The digital revolution has arrived in the halls of public administrations. E-Government, which has been a buzzword for all kinds of computer usage in the governmental context for several years, has started to become an ordinary way for public administrations to organise their work. Document and workflow management systems as well as process reorganisation in the backend and electronic taxation systems or digital ID cards on the frontend side all belong to the portfolio of concepts summarised by e-Government. However, in spite of the advantages that go along with these developments, adoption of e-Government services is still rather low both on the citizens’ side as well as by the employees of public administrations. We conducted a literature review identifying the factors that influence the acceptance of e-Government services by different stakeholders and provide a framework of future research needs.

Keywords: adoption, e-Government, acceptance, literature review
Introduction

The digital revolution has arrived in the halls of public administrations. E-Government, which has been a buzzword for all kinds of computer usage in the public administrative and governmental context for several years, has started to become an ordinary way for public administrations to organise their work. Document and workflow management systems as well as process reorganisation in the backend and electronic taxation systems or digital ID cards on the frontend side all belong to the portfolio of concepts summarised by e-Government. However, in spite of the advantages that go along with these developments, adoption of e-Government services is still rather low both on the citizens’ side as well as by the employees of public administrations (Ipima & Initiative D21, 2011).

Research has acknowledged this problem, and a number of articles have been published in recent years that tackle the field of e-Government acceptance. The major aim of e-Government adoption research is to identify the antecedents determining the acceptance of e-Government. In research articles, we found a plethora of such factors influencing the adoption of e-Government services within or offered by public administrations. However, an integrative view of these models hardly exists. In order to get a structured overview of possible influencing factors, we argue for a need to systematically categorise the related research in the domain of e-Government acceptance. We try to fill this gap by conducting a literature review within 20 highly ranked IS, Public Administration and e-Government journals.¹

Our research aim is to build a framework categorising the related work in the field of e-Government acceptance, identify common constructs and research settings and to unfold the gap of research that still remains to be carried out.

We believe that providing an overview of how research on e-Government adoption is carried out in articles published in highly ranked journals is valuable for researchers in this domain. We will provide a compilation of possibly relevant research methods and highly qualified findings. Our literature search follows the structured process presented by vom Brocke et al. (2009). We analyse the relevant articles using an adopted concept matrix as proposed by Webster & Watson (2002). Thereby we build on the outcomes of previous literature reviews. Our aim is to synthesize the related work in the field of e-Government in order to draw conclusions from the existing literature.

In Section 2 we will give an overview of related work on e-Government adoption and we will briefly introduce the most common models in e-Government acceptance research. Afterwards we will describe our search process and present our category framework for the literature review. The presentation of our results is followed by a derivation of the most compelling findings. Finally we discuss future research that is necessary in the field of e-Government acceptance by synthesising our findings in a framework for future research and summarise our outcomes.

Related Work

Definition of e-Government

Existing literature provides various definitions for the term or – in a broader sense – properties of e-Government. Akkaya, Wolf, & Krmar (2010) define e-Government as “informatisation of public services”. Sharif & Irani (2010) state that e-Government “[…] seeks to provide public services, information

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¹ We used three criteria to decide which Journals to include. First, we included the AIS Senior Scholar’s Basket of Journals (http://home.aisnet.org/displaycommon.cfm?an=1&subarticlenbr=346), second we included all Journals listed in VHB JOURQUAL 2.0 ranking which are ranked with A or B within the sub-ranking for Information Systems and Information Management (http://vhbonline.org/service/jourqual/jq2/teilranking-wirtschaftsinformatik-und-informationsmanagement/). Finally, we included all A or B ranked Journals from the total VHB JOURQUAL 2.1 ranking which are explicitly related to research in the field of Public Administrations or e-Government. In doing this, we did not take Conference Proceedings into account.
and knowledge to citizens, utilizing existing and emerging information technologies.” The European Union (2006) describes e-Government as a term which “[...] means the use of information and communication technologies (ICT) in public administrations combined with organisational changes and new skills. The objective is to improve public services, democratic processes and public policies.” Moon & Norris (2005) talk about e-Government as a “means of delivering government information and service”.

In the end, all these definitions have a common ground. They describe e-Government as an instrument which supports the exchange of (necessary) information between customers and administrations based on information technology. From our perspective customers of administrations can be citizens, business and also other administrations. For our purpose we define e-Government as the electronic exchange of information between customers and administrations based on information technology.

**Studies and literature on e-Government acceptance**

There are many articles on factors influencing the acceptance and adoption of e-Government services. Most of them are mainly quantitatively driven studies and surveys, dealing with the degree of adoption and factors influencing the acceptance of e-Government services from a user perspective. The constructs ‘acceptance’ and ‘adoption’ are in nearly every case discussed commonly. In taking note of this, we do not explicitly distinguish the terms in the following and investigate both, acceptance and adoption, equally although knowing that acceptance will not necessarily end in adoption and vice versa adoption does not allow for concluding on acceptance of a certain technology. The related work we identified can roughly be structured in three groups: articles focussing on single factors or factor groups influencing the acceptance, those focussing on single application areas, or, in some cases, doing both. Most of these articles and surveys deal – in a case study manner – with data from single countries. Our goal is to consolidate this work and to give a general overview. The following studies (which we did not include in our review) give an impression of the diversity or research on e-Government adoption. Akkaya et al. (2010), Yaghoubi, Kord, & Shaker (2010) and Smith (2010) elaborate on trust, security and risk, Cullen (2009) deals with data security, Adeshara, Juric, Kuljis, & Paul (2004) discuss the factor of e-Government readiness of small and medium sized enterprises in the UK all. Phang et al. (2006) analyse the influencing factors on e-Government adoption of the elderly. Other studies concentrate on single application areas in the e-Government area. For example, Grote et al. (2010) examine the acceptance of the new German identity card. Mahadeo (2009) evaluates the factors influencing adoption of an electronic tax filing and payment in Mauritius. Sahu & M. P. Gupta (2007) assess the acceptance of Indian central excise. Further studies deal with both, influencing factors and application areas of e-Government.

There are only few literature reviews which analyse the factors influencing e-Government adoption aiming to give an overview of recent literature and to identify further research perspectives. To the best of our knowledge, only two articles conduct an explicit analysis of literature on e-Government acceptance in general. Patel & Jacobson (2008) perform a literature review to identify factors influencing citizens’ adoption of e-Government. They collect and structure empirical studies according to the three criteria research methodology, the individual characteristics of the citizens and their demographic background. Their focus lies on research in developing countries, especially in India. Concentrating on the Government-to-Citizen (G2C) perspective, they exclude factors that influence the adoption of e-Government services from a Government-to-Business (G2B) or an inside (G2G) perspective. Titah & Barki (2006) analyse articles dealing with the adoption of e-Government in the period from 1990 to 2005. They provide a comprehensive overview of the analysed articles, which stem from a set of relevant journals and the ACM database. First they identify five principal topics: 1) the influence of managerial practices on e-Government adoption; 2) the influence of organisational and individual characteristics on e-Government adoption; 3) the influence of governmental subcultures on e-Government adoption and use; 4) the influence of IT characteristics on e-Government use and acceptance; and 5) the measurement of e-Government impacts (Titah & Barki, 2006). Furthermore, they record the following elements of each article: 1) theoretical framework, 2) methodology, 3) level of analysis, 4) technology, 5) variables or key concepts, and 6) main results or arguments (Titah & Barki, 2006). In doing so, they provide a detailed framework of the analysed articles. We build on their study and adopt categories from their work as the authors also follow a broad approach. In trying to further synthesise our identified articles and focussing on the period from 2000 to 2011, we will give a more condensed and also updated overview.
E-Government Acceptance

Research on e-Government acceptance often builds on ‘quasi standard’ models of IT acceptance (Bélanger & Carter, 2012). These models can roughly be divided into two perspectives on IT acceptance (Bhattacherjee & Sanford, 2006). The first one is geared towards the approaches that are related to the theory of reasoned action (TRA) and the theory of planned behaviour (TPB) further including the technology acceptance model (TAM) and the unified theory of acceptance and use of technology (UTAUT) whereas the second perspective centres on the diffusion of innovation theory.

TRA, TPB, TAM and UTAUT all claim that a user’s intention to use a certain technology is mainly determined by subjective perceptions related to the nature of the respective technology. Common constructs are perceived ease of use and perceived usefulness. The theory of reasoned action, which explains general behaviour and does not focus on technology acceptance, states that human behaviour is driven by behavioural intention whereas this intention in return depends on the attitude towards this behaviour as well as on subjective norms (Fishbein & Ajzen, 1975). Similarly the theory of planned behaviour also consists of the same constructs adding perceived behavioural control as an influence for both behavioural intention as well as behaviour (Ajzen, 1991). The technology acceptance model is especially adopted for the IS domain (Davis, Bagozzi, & Warshaw, 1989). Just like TRA it includes the elements behaviour and behavioural intention. The factors influencing the behavioural intention to use a system are in this case the perceived usefulness as well as the perceived ease of use. The unified theory of acceptance and use of technology combines and integrates the assumptions of TRA, TPB and TAM as well as of six other acceptance theories.

The diffusion of innovations theory (DOI) argues that the adoption of an innovation is characterised by diffusion which is “the process by which an innovation is communicated through certain channels over time among members of a social society” (Rogers, 1995). An innovation can be an idea or an object, which is perceived to be something new. Factors influencing the diffusion rate are the relative advantage of an innovation, its complexity, compatibility, triability and observability.

Besides these explicit theories of IT acceptance, other theories and approaches are also used in the field of e-Government acceptance. In many cases, these theories are borrowed from social sciences like psychology or sociology. Whereas some theories use the term ‘acceptance’, others refer to ‘adoption’. For our purposes, we will use both terms interchangeably.

Literature Review Design

Literature Search Design

For finding relevant literature on e-Government adoption we conducted a structured literature search as proposed by vom Brocke et al. (2009). We identified search words from both the domains e-Government and (IT) acceptance by independently asking 10 IS experts related to e-Government research which words they would search for if they wanted to find relevant articles on the acceptance of e-Government. We composed and consolidated their replies and suggestions.

<table>
<thead>
<tr>
<th>Table 1. Search words for articles relevant to e-Government acceptance and adoption</th>
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<tbody>
<tr>
<td><strong>Search words on (IT) acceptance</strong></td>
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<tr>
<td>acceptance</td>
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<tr>
<td>Technology Acceptance Model</td>
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<tr>
<td>diffusion</td>
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<tr>
<td>UTAUT</td>
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<tr>
<td><strong>Search words on e-Government</strong></td>
</tr>
<tr>
<td>eGovernment</td>
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<tr>
<td>public administration</td>
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</table>
The identified search words are displayed in Table 1. We combined each of the terms on acceptance with each of the terms on e-Government and searched in the title, abstract, key words and, if possible, full text of the articles. We manually went through all articles we found. If, after reading the abstract, it was obvious that the found article did not deal with e-Government acceptance even marginally, the article was not included in the analysis.


The investigated time period was from January 1st 2000 to September 30th 2011. In contrast to other literature reviews, we did not go back to the early days of e-Government, which date back to the 1990s as we are more interested in current developments, i.e. which factors have proven to influence e-Government acceptance and adoption and especially which current research gaps exist that still require researchers’ attention.

Altogether we identified 34 articles of which after reading them completely, 22 turned out to be relevant. The twelve papers we dropped are either related to acceptance research but not to e-Government research although there was a word out of the set of search words on e-Government somewhere in the text or – and that was mainly the situation – the paper described a case or a survey related to e-Government or Public Administration but in detail there was no research on acceptance or adoption mentioned and the search word was embedded in another context. We do not claim our review to be complete as there is a multitude of other outlets including journals and conference proceedings as well as books which will include relevant contributions to the field of e-Government acceptance and adoption research. Furthermore, we only considered journals within the domains of Information Systems, Public Administration and e-Government whereas other disciplines like sociology and psychology also study this area. However, we believe that analysing the 20 highly ranked IS and Public Administration journals will give a good overview of research in this topic.

**Review Framework**

For structuring our literature review, we use Webster and Watson’s suggestion of a concept matrix (Webster & Watson, 2002). In contrast to author-centric literature reviews, concept-centric approaches categorise articles according to topic-related concepts.

Our criteria used in the concept matrix have been derived theoretically prior to reading the identified articles and have been adopted in the process of working with the articles. According to Webster and Watson, a literature review needs “to add value by categorizing articles based on a scheme that helps to define the topic area, such as types of variables examined, level of analysis, gaps in the literature, or other important theoretical issues” (Webster & Watson, 2002). In order to identify the topic of the articles, we recorded their research question or research aim as well as the article’s outcome, which is, for example, an explanatory model or a set of hypotheses. As proposed by Titah & Barki who state that “given the multi-level nature and scope of e-government, issues related to the influence of multiple stakeholders (internal and external constituencies) [...] clearly warrant further attention” (Titah & Barki, 2006), we incorporated the dimension stakeholders being the unit of analysis the adoption research takes into account in the respective article.

Another block of categories of the concept matrix are the ones related to acceptance models. First of all, we record whether authors apply existing underlying acceptance models like TAM, TRA or UTAUT for their research. Furthermore it is analysed which acceptance constructs turning out to be relevant or significant authors find in their research. Some articles plead for more research on the antecedents of the
constructs explaining e-Government adoption (Bélanger & Carter, 2008). Especially TAM yet also other acceptance models have been criticised for treating their concepts as “black boxes” (Benbasat & Barki, 2007). In particular, objective measures are missing. Therefore when articles apply constructs related to acceptance, we will analyse which objective antecedents they incorporate in their model.

Regarding content, we will also record identified research gaps or future research as pointed out by the authors. We will classify them to find out whether there is a research gap that seems urgent as it is claimed by several members of the research community. This issue will give hints for researchers where to position their research. Furthermore, practical implications or solution approaches to the problems identified in the papers are collected. We will synthesise these findings in order to understand trends and to identify recommendations that might still need scientific consideration.

For methodological guidance how a well-conducted research in the topic of e-Government adoption could look like we also surveyed the applied research design. Furthermore, we noted down the research setting including the number of enquired subjects.

**Results**

We identified 22 articles in the period from January 2000 to September 2011 that investigate the acceptance of e-Government. Table 2 lists the relevant articles including their summarised research topic, their research design, the considered stakeholders, the research sample and its size as well as the country in which the study was conducted.

For the research design we distinguish quantitative empirical surveys (ES), which in most cases use the instrument of standardised questionnaires, empirical analysis (EA), by which we summarise the evaluation of data that have been gathered by third parties, e.g. by external associations, and that were not explicitly targeted to answer the research question of the respective articles. Furthermore we found content analysis (CA), which was, for instance, applied for examining the content of web sites or the governments’ diffusion strategies. Other research designs are cards technique (CT) used for generating ideas, qualitative analyses (QA), which comprise e.g. qualitative interviews and group discussions, as well as literature reviews (LR). The stakeholders of the articles were split up into governments (G), citizens (C), businesses (B), and government employees (GE). The column ‘sample size’ includes both, the number of enquired subjects as well as their type. Data gathered from questionnaires sent to governments or from questioning administrational officers concerning their governments’ affairs are summarised as ‘governments’. ‘Citizens’ denotes all types of data gathered by enquiring citizens who attended a certain event or who were randomly chosen. Missing values (-) indicate that the article did not reveal detailed information on the specific aspect.

The most common form of research design is empirical surveys, which were conducted by twelve articles. This is followed by empirical analysis used by three articles. Two authors combined content analysis and empirical analysis, one applied a mixture of empirical survey and qualitative analysis, one performed a qualitative analysis, another one a content analysis and one article applied a mixture approach of cards technique and qualitative analysis.

As for the stakeholders, citizens seem to be in the focus of research with eleven articles concentrating solely on them. Governments are considered seven times, government employees twice and businesses as well as governments, citizens and businesses in combination in one article each.

Most studies are conducted in the United States of America (ten articles). Two authors locate their research in Singapore, and one article in each case gathered its data in Ukraine, Denmark, the United Kingdom, India, The Netherlands, China and Turkey.

Analysing the explicitly mentioned acceptance models the authors used in their articles shows that TAM (Bhattacherjee & Sanford, 2006; Carter & Bélanger, 2005; Lee & Rao, 2009; Sipior, Ward, & Connolly, 2011; Stafford & Turan, 2011; Yao & Murphy, 2007) and the diffusion of innovations theory (Bhattacherjee & Sanford, 2006; Carter & Bélanger, 2005; Henriksen & Damsgaard, 2007; Huang, 2007; Korteland & Bekkers, 2008; Tung & Rieck, 2005) are applied the most in our sample with six articles each using them. UTAUT serves as related model in five articles (Chan et al., 2010; Gupta, Dasgupta, & Gupta, 2008; Lee & Rao, 2009; Yao & Murphy, 2007) and the theory of reasoned action (Bhattacherjee &
Sanford, 2006; Bélanger & Carter, 2008) as well as the theory of planned behaviour (Bhattacherjee & Sanford, 2006; Stafford & Turan, 2011) in two articles each. However, most articles integrate more than one acceptance model when deriving their own research hypotheses. In many cases, these models are enriched by further theories stemming from the social sciences like trust models (Carter & Bélanger, 2005; Lee & Rao, 2009; Li, Hess, & Valacich, 2008; Teo, Srivastava, & Jiang, 2008).

Most of the articles analyse various e-Government technologies like governments’ web sites or services which are not specified in more detail. Three articles analyse two respectively three different services from the domain of motor vehicles and taxation. The remaining articles consider a single e-Government service each like a database management system, the electronic ID, an electronic voting system, an SMS service or a geographic information system.

<table>
<thead>
<tr>
<th>Article code</th>
<th>Article code</th>
<th>Research topic (e-Government technology)</th>
<th>Research design</th>
<th>Stakeholders</th>
<th>Sample size</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Moon (2002)</td>
<td>e-Government adoption by municipal governments (various e-Government technologies, e.g. web site, electronic services etc.)</td>
<td>EA</td>
<td>G</td>
<td>1471 (governments)</td>
<td>USA</td>
</tr>
<tr>
<td>2</td>
<td>West (2004)</td>
<td>Status of e-Government adoption by governments (e-Government web site)</td>
<td>CA, EA</td>
<td>C</td>
<td>3493 (web sites) 1003 (citizens)</td>
<td>USA</td>
</tr>
<tr>
<td>3</td>
<td>Carter &amp; Bélanger (2005)</td>
<td>Citizen adoption of e-Government (online systems of Departments of Motor Vehicles and of Taxation)</td>
<td>ES</td>
<td>C</td>
<td>105 (citizens)</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>Moon &amp; Norris (2005)</td>
<td>Link between culture of innovation and development of e-Government by governments (various e-Government technologies, e.g. web site, electronic services etc.)</td>
<td>EA</td>
<td>G</td>
<td>739 (governments)</td>
<td>USA</td>
</tr>
<tr>
<td>5</td>
<td>Norris &amp; Moon (2005)</td>
<td>Local government adoption of e-Government (various e-Government technologies, e.g. web site, electronic services etc.)</td>
<td>EA</td>
<td>G</td>
<td>4009 (governments)</td>
<td>USA</td>
</tr>
<tr>
<td>6</td>
<td>Tung &amp; Rieck (2005)</td>
<td>Adoption of e-Government services by business organisations (e-Government services in general)</td>
<td>ES</td>
<td>B</td>
<td>128 (businesses)</td>
<td>Singapore</td>
</tr>
<tr>
<td>7</td>
<td>Bhattacherjee &amp; Sanford (2006)</td>
<td>Influence processes of IT acceptance and their persistency (database management system)</td>
<td>ES</td>
<td>GE</td>
<td>83 (government employees)</td>
<td>Ukraine</td>
</tr>
<tr>
<td>8</td>
<td>Henriksen &amp; Damsgaard (2007)</td>
<td>Success of e-Government diffusion strategies of the government (various e-Government services, e.g. electronic document handling etc.)</td>
<td>CA, EA</td>
<td>G, C, B</td>
<td>7 (gov. initiatives) (governments)</td>
<td>Denmark</td>
</tr>
<tr>
<td>9</td>
<td>Huang (2007)</td>
<td>Adoption of e-Government Web sites by U.S. counties (e-Government web site)</td>
<td>CA</td>
<td>G</td>
<td>3099 (web sites)</td>
<td>USA</td>
</tr>
<tr>
<td>10</td>
<td>Irani et al. (2007)</td>
<td>Relevant key areas for future research in e-Government (no specific technology)</td>
<td>CT, QA</td>
<td>C*</td>
<td>- (gov. employees, citizens)</td>
<td>UK</td>
</tr>
<tr>
<td>11</td>
<td>Yao &amp; Murphy (2007)</td>
<td>Adoption of remote electronic voting systems (electronic voting system)</td>
<td>ES</td>
<td>C</td>
<td>453 (citizens)</td>
<td>USA</td>
</tr>
<tr>
<td>12</td>
<td>Bélanger &amp; Carter (2008)</td>
<td>Influence of trust and risk perception on the adoption of e-Government services (online systems of Departments of Motor Vehicles and of Taxation)</td>
<td>ES</td>
<td>C</td>
<td>214 (citizens, students)</td>
<td>-</td>
</tr>
<tr>
<td>13</td>
<td>Gupta et al. (2008)</td>
<td>ICT adoption by government employees in a developing country (internet)</td>
<td>ES</td>
<td>GE</td>
<td>102 (government employees)</td>
<td>India</td>
</tr>
</tbody>
</table>
Table 2. Articles identified by the literature review

<table>
<thead>
<tr>
<th>Article code</th>
<th>Article Research topic (e-Government technology)</th>
<th>Research design</th>
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<th>Sample size</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>Korteland &amp; Bekkers (2008)</td>
<td>QA</td>
<td>G**</td>
<td>10 (gov. employees) - (web sites)</td>
<td>Netherlands</td>
</tr>
<tr>
<td>15</td>
<td>Li et al. (2008)</td>
<td>ES</td>
<td>C</td>
<td>443 (students)</td>
<td>USA</td>
</tr>
<tr>
<td>16</td>
<td>Teo et al. (2008)</td>
<td>ES, QA</td>
<td>C</td>
<td>214 (students) 7 (professionals)</td>
<td>Singapore</td>
</tr>
<tr>
<td>17</td>
<td>Lee &amp; Rao (2009)</td>
<td>ES</td>
<td>C</td>
<td>71 (students)</td>
<td>USA</td>
</tr>
<tr>
<td>18</td>
<td>Chan et al. (2010)</td>
<td>ES</td>
<td>C</td>
<td>1179 (citizens)</td>
<td>China</td>
</tr>
<tr>
<td>19</td>
<td>Jun &amp; Weare (2010)</td>
<td>LR</td>
<td>G</td>
<td>1396 (governments)</td>
<td>USA</td>
</tr>
<tr>
<td>20</td>
<td>Ganapati (2011)</td>
<td>ES</td>
<td>G</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>21</td>
<td>Sipior et al. (2011)</td>
<td>ES</td>
<td>C</td>
<td>37 (citizens)</td>
<td>USA</td>
</tr>
<tr>
<td>22</td>
<td>Stafford &amp; Turan (2011)</td>
<td>ES</td>
<td>C ***</td>
<td>352 (professionals)</td>
<td>Turkey</td>
</tr>
</tbody>
</table>

*The authors state as target group: citizens and “other stakeholders” **police stations ***accounting professionals

The analysis of factors influencing the acceptance of e-Government draws a rather heterogeneous picture. Summing up among all articles, 110 constructs turned out to be significant for the acceptance of e-Government. Out of these 110 constructs only seven constructs were tested and found to be significant by more than one author still leaving 91 unique constructs. In order to clearly present the results, we split up the analysis based on the stakeholder groups. When we found variables to be similar, we combined them into one variable. However, it has to be kept in mind that most of the articles analysed a specific case like e-Government web sites or e-voting systems. Therefore, constructs that have turned out to be significant for one analysis might not be significant for another situation and vice versa.

**E-Government Adoption by Citizens**

In most cases the variable mediating the acceptance or use by citizens is titled intention to use or something similar (Bélanger & Carter, 2008; Carter & Bélanger, 2005; Lee & Rao, 2009; Stafford & Turan, 2011; Teo et al., 2008; Yao & Murphy, 2007). Sometimes other variables are used as mediators of e-Government usage like satisfaction (Chan et al., 2010). Some articles even measure usage of e-Government services directly (Sipior et al., 2011). Whereas adoption or acceptance research generally focuses on the initial usage of services that the potential user has not yet tried, Teo et al. (2008) analyse intention to continue using as the outcome variable.

Due to the plethora of significant constructs that influence the intention to use e-Government services, we clustered them in a taxonomy adapting the approach of Sipior et al. (2011). We distinguish technology characteristics referring to a user’s perception of the used technology, environmental characteristics, which subsume external influences, service characteristics describing the features of the considered e-Government service, user characteristics including the user’s experience and skills as well as trust, which comprises both trust in a person respectively organisation and trust in a technology.
Technology characteristics

The acceptance construct that turned out to be significant most frequently is perceived ease of use respectively effort expectancy (Bélanger & Carter, 2008; Carter & Bélanger, 2005; Chan et al., 2010; Sipior et al., 2011; Yao & Murphy, 2007). Research models that are based on the Technology Acceptance Model use the former notation whereas UTAUT-based studies refer to effort expectancy. Both concepts denote the degree to which a person believes that using a particular system – in this case the e-Government service – would be free of effort for them. (Davis et al., 1989; Venkatesh, Morris, & Davis, 2003)

In addition to this, the other prominent construct of TAM, perceived usefulness respectively performance expectancy as used in UTAUT, was tested and turned out to be a significant influencing factor for intention to use in several studies (Chan et al., 2010; Lee & Rao, 2009; Stafford & Turan, 2011). Perceived usefulness describes the degree to which a user thinks that using a particular system would enhance his (job) performance (Davis et al., 1989).

Perceived compatibility, which is “the degree to which an innovation is seen to be compatible with existing values, beliefs, experiences and needs of the adopter” (Rogers, 1995), is another significant antecedent for the intention to use an e-Government service (Carter & Bélanger, 2005).

Environmental characteristics

A significant construct in the category of environmental characteristics are facilitating conditions (Chan et al., 2010), which define “the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system” (Venkatesh et al., 2003). This factor, again, stems from UTAUT.

When analysing the adoption of e-Government services by digitally disadvantaged citizens, perceived access barriers to e-Government services (Sipior et al., 2011) referring to e.g. access and skill of the potential users have shown to be important.

Service characteristics

In contrast to other adoption research that focuses on the initial usage of services that the potential user has not yet used, Teo et al. (2008) analyse the intention to continue using as outcome variable. They found that both the citizen’s level of satisfaction with the web site as well as information quality, i.e. the “citizen’s assessment of whether the information on the Web site is accurate, valid and timely” (Teo et al., 2008) are influencing factors for the intention to continue using. A similar relevant factor is accuracy, which refers to the degree of correctness of an e-Government service. (Yao & Murphy, 2007)

Two further constructs of service characteristics have shown to have a significant influence on the acceptance of e-Government services: privacy (Yao & Murphy, 2007) as well as mobility referring to the degree of flexibility a user can achieve by “eliminating location and time or schedule restrictions” (Yao & Murphy, 2007).

User characteristics

In terms of user characteristics, self-efficacy (Stafford & Turan, 2011), “the ability of a technology user to master a new technology” (Venkatesh et al., 2003), has proven to be a significant antecedent of the intention to use an e-Government service. This construct is part of UTAUT, again.

Trust

A great part of the research on e-Government acceptance is based on trust research. Trust in general means the “willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action” (Mayer, Davis, & Schoorman, 1995) that is important to the trusting party irrespective of whether he or she can monitor or control that other party. One can
distinguish between different forms of trust that is used in the e-Government acceptance models: trust in a person or an organisation, trust in a technology as well as trust in a person (or an organisation) that he or she will be able to deal with a technology in a desired way, which is often denoted as confidence. The following constructs have been assessed as significant:

Among the constructs stemming from trust research, trust in the internet has been identified as a significant factor influencing e-Government acceptance by two articles (Bélanger & Carter, 2008; Carter & Bélanger, 2005). This kind of trust comprises trust in the security measures, safeness and performance structures of the internet. (Bélanger & Carter, 2008) Along with this goes the construct confidence in structural assurance of the internet (Lee & Rao, 2009), which refers to the technical and legal safeguards that can protect the user from potential dangers.

Trust of the government, which is defined as the citizens’ trust regarding the integrity and ability of the agency providing the service (Bélanger & Carter, 2008), is an example of trust in a person respectively an organisation that has been identified as a significant factor. (Bélanger & Carter, 2008)

Whereas trust in the internet and trust of the government are regarded as direct antecedents of intention to use by Bélanger and Carter (2008), Teo et al. (2008) include further mediator variables in their model, i.e. they analysed trust in government and trust in technology (which did not turn out to be significant) as factors influencing trust in an e-Government web site, which in turn influences further constructs.

Lee and Rao (2009) also apply a different level of detail in their research. Their analysis reveals that trust in a government is an antecedent for confidence in the e-Government agency’s internet competence, which in turn influences the intention to use e-Government services.

Li et al. (2008) do not only consider trust as an influencing factor but instead of choosing intention to use as the outcome variable, they focus their model on trusting intention.

Remaining constructs

Summing up, it becomes obvious that all constructs that directly influence the intention to use e-Government (or another outcome variable) are subjective perceptions of the respective user. These subjective variables are themselves subject to the influence of other variables. As motivated by Benbasat and Barki (2007), we analysed these antecedents and classified whether they are subjective perceptions as well or whether they can be put down to objective variables. A variable is classified as subjective if the participants of a survey were asked to judge their perception of a certain issue. If, however, they were asked about facts or whether the authors themselves determined the value of variable and added a dummy variable in their analysis, we determined the respective antecedent as objective. These variables as well as the articles using them (cf. Article code in Table 2) are presented in Table 3. We marked the objective antecedents by an asterisk in the following. The remaining variables that influence the presented antecedents mainly stem from the field of trust building and are not broken down into more detail. The variables that have not been explained in the section above are briefly defined in the following.

Disposition to trust is a user’s “general propensity to trust others” (Bélanger & Carter, 2008). It is composed of faith in humanity and trusting stance. Disposition to trust influences both trust in the internet and trust in the government. Task complexity as “the degree of ambiguity and uncertainty involved in the government-citizen interaction processes and consequences” (Lee & Rao, 2009) serves as an influencing factor for perceived usefulness of an e-Government service. As used in the study presented by Lee and Rao (2009), we regard task complexity as a variable that is measured objectively because the authors themselves define the complexities of the used systems and do not leave the choice on how complex the system is to the user. Whereas service quality refers to a user’s perception of the reliability of the offered services, system or website quality can be defined as how the user perceives the technical performance of the web site for information retrieval and delivery. (Teo et al., 2008) The authority level of an agency distinguishes between whether the government is located at state-level or at federal level. (Sipior et al., 2011) As this characteristic is clearly defined, the authority level of an agency is an objective antecedent. Chan et al. (2010) define convenience “as a citizen’s perception of the time and effort required to use an e-government technology”, flexibility as “the extent to which an e-government technology is able to adapt to the changing demands of citizens” and assistance as “a citizen’s perception that help can be easily obtained when he or she encounters difficulties in using the
technology”. To a certain degree flexibility can be determined objectively as e.g. a software solution that is based on object-oriented programming is more flexible than a procedural programme. However, the evaluation of the single components still leaves room for interpretation. **Socioeconomic variables** summarise elements like age, education level, employment status, income etc. and are therefore variables that can be measured objectively.

<table>
<thead>
<tr>
<th>Antecedents influencing intention to use</th>
<th>Disposition to trust</th>
<th>Trust</th>
<th>Task complexity *</th>
<th>Service quality</th>
<th>System (web site) quality</th>
<th>Authority level of agency *</th>
<th>Compatibility</th>
<th>Self-efficacy</th>
<th>Perceived usefulness</th>
<th>Flexibility (c)</th>
<th>Convenience</th>
<th>Assistance</th>
<th>Socioeconomic variables *</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived ease of use</td>
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<tr>
<td>Trust in the internet</td>
<td>12, 17</td>
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<tr>
<td>Trust in the government</td>
<td>12, 17</td>
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<td>Information quality</td>
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<td>Level of satisfaction</td>
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<tr>
<td>Perceived usefulness</td>
<td>17, 18</td>
<td>17</td>
<td>17</td>
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<td>18, 22</td>
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<td>Facilitating conditions</td>
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</table>

**E-Government Adoption by Governments**

The constructs influencing the e-Government adoption on the side of public administrations “are less likely to be technological, and more to be institutional” (Ganapati, 2011). In contrast to those describing the acceptance by citizens, the influencing variables for governments are less nested. The target variable in this case is **adoption of e-Government** (Huang, 2007; Korteland & Bekkers, 2008; Moon, 2002; Moon & Norris, 2005; Norris & Moon, 2005), **diffusion of e-Government** (Huang, 2007; Korteland & Bekkers, 2008) and **motivation for adoption** (Jun & Weare, 2010).

In order to structure the identified variables we distinguish between **regional and population characteristics**, which refer to the population composition and the geographical position of the government, **government characteristics** that denote the internal structure of the administration and **managerial characteristics** describing the style and strategy of the government management. Furthermore we use the categories **government capacities**, which include the resources of the government, and **environmental characteristics** describing the external influence.

**Regional and population characteristics**

The most frequently tested factor for the e-Government adoption by governments is the **size of the population** the administration is responsible for (Jun & Weare, 2010; Moon, 2002; Moon & Norris, 2005; Norris & Moon, 2005).

Another factor that have proven to be a significant antecedent of e-Government adoption is the **metropolitan status of the government**, i.e. whether the respective government (in this case local government) belongs to a central suburban or independent city. (Norris & Moon, 2005)
Norris and Moon (2005) found a significant correlation between the region* of a government and the e-Government adoption. They distinguished between west, south north-central and northeast regions of the USA. However, these differences cannot be applied to other countries without limitations as the reason in this case is surely not the geographic direction but rather structural characteristics of the single regions.

Furthermore socioeconomic factors* of the population (Huang, 2007; Jun & Weare, 2010) are significant factors influencing the e-Government adoption by government agencies. Again, they refer to the demographic situation, income distribution, and education etc. of the population.

All factors of the characteristics with regard to region and population are variables that can be measured objectively.

**Government characteristics**

Important factors for the e-Government adoption are also the type and form of government* (Moon, 2002; Norris & Moon, 2005). Type refers to whether the government is an administration for a city or a county, and form of government distinguishes whether the head of the government is a mayor-council or council-manager for cities and council administrator or council-elected executives for counties.

Korteland and Bekkers (2008) found the organisational size* to be a significant factor driving the acceptance of e-Government with larger organisations being early adopters more frequently than smaller ones.

Again, all three significant factors in the category government characteristics can be recorded objectively.

**Managerial characteristics**

The managerial innovation orientation of a government has turned out to be a factor influencing the adoption of electronic government services by administrations. (Moon & Norris, 2005) It describes the degree to which a government is receptive to managerial and technological innovations and new practices.

Furthermore, the diffusion strategy* (Korteland & Bekkers, 2008), i.e. the process in which an e-Government service is communicated via certain channels, plays a role for governments’ adoption of e-Government. From our point of view, this strategy has an objective characteristic as we can record e.g. the channels via which an innovation is communicated. However, in order to measure the influence of the diffusion strategy, quantitative measures are required as Korteland and Bekkers (2008) concentrated on the qualitative evaluation of the diffusion strategies.

Finally, Korteland and Bekkers (2008) identified the political meaning as a factor driving the adoption of an innovation by governments, which is “based on the logic of appropriateness and refers to the opportunity structure an innovation can provide” (Korteland & Bekkers, 2008)

**Government Capacities**

Moon and Norris (2005) identified government capacities as drivers for e-Government adoption by public administrations. They distinguish technical capacity*, which summarises the number of technical staff, technical expertise, available information about e-Government applications and technical upgrades, financial capacity* relating to the financial resources of a government and political support* meaning the support for a certain innovation by elected officials.

All three factors are beyond the scope of individual perception and are therefore objective variables.

**Environmental characteristics**

The degree to which governments are linked, the degree to which governments in a network can control each other as well as the geographical and cultural proximity between them – summarised as professional networks* – seem to have an influence on the adoption behaviour of administrations.
(Korteland & Bekkers, 2008) Although these features represent objective characteristics, detailed instructions on how to measure them are required for evidence of the statistical significance of this factor.

Closely linked to this variable is the **proximity to other governments*** that measures how close by other governments are located. This objectively measurable factor also turned out to be significant. (Jun & Weare, 2010)

Furthermore **social expectations**, i.e. expectations by early adopters, as well as the **external influence of the motivation** referring to e.g. vendors of e-Government solutions directly influence the willingness to adopt e-Government services. (Jun & Weare, 2010)

**E-Government Adoption by Government Employees**

Two articles analysed the adoption of internal e-Government services by government employees. The results do not differ significantly from the analysis of citizen adoption. The outcome variables are **IT usage intention** (Bhattacherjee & Sanford, 2006) resp. **behavioural intention** and **user behaviour** (Gupta et al., 2008).

Influencing factors for behavioural intention turned out to be **performance expectancy**, **effort expectancy** and **facilitating conditions**, all of which were also significant for citizens’ adoption of e-Government and which are constructs from UTAUT. In addition to this, **social influence** (also a construct from UTAUT) was identified as an antecedent for user behaviour. (Gupta et al. 2008) Social influence is “the degree to which an individual perceives that important others believe he or she should use the new system”. (Venkatesh et al., 2003)

Finally, also the **attitude** towards an e-Government service has shown to be a significant factor influencing for usage intention. (Bhattacherjee & Sanford, 2006)

Bhattacherjee and Sanford (2006) found that performance expectancy is influenced by the constructs **argument quality**, which is “the persuasive strength of arguments embedded in an informational message”, **source credibility**, “the extent to which an information source is perceived to be believable, competent, and trustworthy by information recipients”, **job relevance**, which is the user’s perception concerning the relevance of the e-Government service for their work, and **user expertise**, i.e. the user’s general ability to use IT.

Furthermore **attitude** is influenced by **perceived usefulness**, source credibility and job relevance as well as user expertise.

**E-Government Adoption by Businesses**

The analysis for e-Government acceptance by businesses revealed that **perceived benefits**, i.e. the anticipation of the advantages that the e-Government service can provide to the organisation, significantly influence e-Government adoption by businesses.

Furthermore **external pressure**, which relates to the efforts of government agencies and industry associations to encourage e-Government adoption, as well as **social influence** have an impact on the organisation’s adoption of e-Government services (Tung & Rieck, 2005).

It is striking that although businesses are organisations as are governments, the significant constructs for businesses are all subjective perceptions.

**Discussion, Future Research Needs and Implications**

The results show that especially during the last years, the research community has developed a great sensitivity for the topic of e-Government acceptance and adoption addressing a variety of diverse e-Government cases. Researchers are relatively aware of other authors’ work as has shown a citation analysis of the identified articles. Especially the older articles are referred to for building research on. However, unlike almost all authors suggest in their outlook for future research, once developed models are seldom tested and enhanced by other articles. Solely the recurring ‘standard models’ like TAM,
UTAUT and DOI are use over and over again. Further test and extensions of existing models would increase the information about its validity, though, and are therefore recommended.

It is rather striking that most of the articles are quantitative surveys. Quantitative analyses are helpful when testing a proposed model by statistical means. However, they do not provide a deeper understanding of the relations between the single constructs as qualitative studies would do. Some authors have acknowledged this problem combining qualitative and quantitative research designs. Certainly this is still the exception. “Other research methodologies such as survey, field interview, case study may be better in exploring the effects of internal factors [...] To obtain comprehensive and objective results, future research may consider combining both survey and content analysis methodologies” (Huang, 2007). Especially when it comes to the antecedents for the well-established constructs like ‘perceived ease of use’ or ‘perceived effort expectancy’, there is hardly any consensus leading to a rather unexplored area. Therefore, we believe that qualitative research in the form of unstructured interviews will provide valuable insights into how these subjective perceptions are formed.

When looking at the distribution of countries in which studies on the acceptance of e-Government are conducted, it is obvious that the centre of research lies in the USA. This is definitely due to the fact that most researchers are located in North America. However, it might also give valuable insights to conduct research in other nations. For example, Europe being significantly underrepresented lends itself to conduct research studies in the field of e-Government. Especially countries which are highly listed in e-Government rankings might provide valuable insights as one can learn from their best practices. On the other hand, there are only few articles that analyse the situation in developing countries. What is more, we could not identify a study in our research sample that compared the acceptance of e-Government between different countries. We think that this issue is of special importance as the globalising trend points towards nation-spanning e-Government solutions. This is especially true for confederations like the European Union. On the one side member states are independent from each other and responsibly for their administrations, on the other side, the member states and the central departments responsible for that are trying to standardize services and processes within the complete confederation more and more. Accompanying and moderating these processes would give valuable insights, however, especially as past research has shown that cultural aspects of individual societies play an important role in the adoption of e-Government. Therefore, e-Government solutions cannot be applied to another nation without limitations.

The comparison of factors influencing the adoption of e-Government among different stakeholders shows different foci of interest as well as varying patterns. Whereas adoption by citizens and governments is fairly well researched with eleven respectively seven studies in our sample, acceptance behaviour by businesses and government employees has so far been neglected. Especially the latter case should be of interest because the benefits of e-Government cannot be achieved when the inner structures of governments struggle to submit themselves to IT and organisational redesign. But also e-Government acceptance and IT adoption by businesses is an interesting field of research as – from a business perspective – potentials for achievements and cost savings are obvious as (regularly) contacts between government and businesses is much more intensive than between governments and citizens. Comparing the adoption models for citizens and for governments, it is eye-catching that the former feature a more sophisticated and nested structure in contrast to the rather plain models for adoption by governments. It is striking that adoption research for governments and for businesses differs completely. We therefore think that it is worthwhile analysing the differences between e-Government adoptions in both forms of organisation.

When looking at the amount of 91 different variables that significantly influence the adoption of e-Government services, it becomes obvious that research covers a broad bandwidth of influencing factors. Although such a comprehensive coverage of different aspects is a positive development, most of the factor groups remain thematically isolated and are barely interconnected. In most cases, studies mainly focus on a single aspect of e-Government acceptance and adoption neglecting different influencing constructs as well as their intertwinement. It is desirable for future research to integrate adoption variables stemming from different thematic areas in order to get a more comprehensive overview of e-Government acceptance. Another aspect that adds to the above mentioned missing reusability of e-Government adoption models is the fact that most of these 91 variables have been tested in a distinct situation that is
characterised by a specific service and a certain group of participants. In order to enhance the validity of the single constructs, we recommend further studies with varying contexts.

It is striking that most articles do not differentiate e-Government technologies in more detail but often talk about e-Government services or web sites in general. In case a specific service is used to test the research model, its characteristics are often neglected and the results are universalised to e-Government in general. For eliminating the bias being inherent in the specific e-Government services, we suggest to test the research model using different e-Government services or to pay more attention to the features of the analysed service.

Furthermore when we analysed the antecedents of acceptance constructs, it becomes clear that hardly any objective antecedents exist. Only within government research objective variables are used as direct antecedents of the intention to use e-Government services. Although demanded by several researchers (Bélanger & Carter, 2008; Chan et al., 2010; Lee & Rao, 2009; Li et al., 2008; Yao & Murphy, 2007) current research has not achieved to go beyond explaining “that ‘usefulness is useful’” (Benbasat & Barki, 2007). In order to make research outcomes of e-Government acceptance more applicable to practice, we plead for integrating more objective antecedents into research.

An analysis of the articles’ practical implication reveals that most authors make rather similar demands to practitioners. Fourteen articles state the need to introduce some kind of communication strategy. This includes targeted training for less experienced users as well as advertisement via different channels. “[A]gencies need to publicize the existence of government-service portals. […] Marketing tools, such as placing the portal address on state documents, putting the address on vehicle license places (as in Pennsylvania, for example), and using televised public service announcements would help the average citizen learn how to access e-government resources.” (West, 2001) Further authors suggest posting security and privacy seals on the Web site, distributing pamphlets and posters and publicising stories of success (Bélanger & Carter, 2008). Although this demand for targeted communication has been formulated that often, no article considers the effect of communication in their models explaining the acceptance of e-Government. We really see a gap in e-Government acceptance and IT adoption research as communication has often been regarded as an intuitive influence factor but has not been analysed exhaustively even not by the diffusion of innovations theory. It also astonishes that although the assumption of influence of communication is mentioned that often, practice predominantly does not reflect this (assumed) success factor. So, concrete communication concepts and their evaluation in different environments would be recommended. Such analyses would also be beneficial for practitioners like government staff, who have expressed the wish for a closer link between practice and research (Irani, Elliman, & Jackson, 2007). Such objective and concrete factors like targeted communication could be used in order to achieve a growing acceptance of e-Government on the citizens’ side.

Contrasting the factors that influence e-Government acceptance with general and e-commerce acceptance variables shows that research that is present in the field of e-Government is rather similar to the latter. The seven constructs which are significant in more than one study stem from ‘general’ acceptance models (TAM and UTAUT) like perceived ease of use and perceived usefulness as well as from trust research. There are only a few studies that include (e-)government-specific variables like trust of the government, authority level of an agency or perceived access barriers to e-Government services. However, there are further characteristics that distinguish governments from businesses. According to Jorgensen & Cable (2002) these are access meaning that unlike businesses, governments cannot choose their customers, structure being more centralised in a government and accountability towards the public. Furthermore, governments are not geared towards profit as are companies. Despite these differences, research in e-Government acceptance strongly resembles e-commerce acceptance research. Therefore, we plead for considering further government-specific constructs. Bélanger & Carter (2012) also argue that due to the plethora of studies on e-Government adoption, a comprehensive e-Government adoption study is desirable which would unify the isolated research.

The outcomes of the analysed articles are in most cases models or single factors that explain the e-Government acceptance by and adoption of specific stakeholders whereas only one article derives practical recommendations. Despite the scientific demands, it should be kept in mind that e-Government is a very practical domain. We therefore suggest following up the theoretical insights with practical recommendations which in turn should be evaluated as well. As Bélanger & Carter (2012) state:
“researchers can help inform practice by helping agencies avoid failure.” This will contribute to the recognition of e-Government acceptance as a relevant area of research.

Further typical issues addressed by the ‘practical implications’ and ‘future research’ sections is to provide better services and more incentives to the stakeholders for using the offered services (Irani et al., 2007). Additionally, most authors see the need for investigating other factors not included in their research model and to transfer the outcome to analyses in different domains, cultural settings and contexts or to apply it to different stakeholder groups. Some authors suggest to transfer their research to more realistic settings, especially when they used student groups as research samples (Li et al., 2008). Finally, many researchers explicitly state the demand for conducting longitudinal studies in the field of e-Government adoption (Chan et al., 2010; Huang, 2007; Norris & Moon, 2005; Sipior et al., 2011).

We synthesised the results of our evaluation in a framework that points out the most relevant future research needs (cf. Table 4).

<table>
<thead>
<tr>
<th>Table 4. Framework of future research needs in e-Government adoption</th>
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</thead>
<tbody>
<tr>
<td><strong>Implications for future research</strong></td>
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<tr>
<td><strong>Research design</strong></td>
</tr>
<tr>
<td>• Include more qualitative studies like in-depth interviews and combine qualitative and quantitative research in order to get a deeper understanding of e-Government adoption</td>
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<tr>
<td>• Conduct longitudinal studies to eliminate short-term effects and to understand the development of the domain</td>
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<tr>
<td><strong>Country</strong></td>
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<tr>
<td>• Extend the research setting to countries with a high e-Government readiness apart from the USA (e.g. Europe)</td>
</tr>
<tr>
<td>• Conduct studies in less developed countries</td>
</tr>
<tr>
<td>• Compare the e-Government adoption and its reasons in different countries, taking cultural factors into account</td>
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<tr>
<td><strong>Stakeholders</strong></td>
</tr>
<tr>
<td>• Include more research on e-Government adoption of businesses as well as of government employees</td>
</tr>
<tr>
<td>• Extend e-Government adoption model of governments and contrast it to G2B models</td>
</tr>
<tr>
<td><strong>Adoption factors and objective antecedents</strong></td>
</tr>
<tr>
<td>• Include cultural aspects into research models</td>
</tr>
<tr>
<td>• Consider objective antecedents that influence the ‘perceived’ factors in order to increase the objectivity of the models</td>
</tr>
<tr>
<td>• Investigate the role of communication in the process of e-Government acceptance</td>
</tr>
<tr>
<td>• Identify antecedents for perceived ease of use and perceived effort expectancy</td>
</tr>
<tr>
<td>• Combine factors from different thematic areas in one research model to get a comprehensive understanding of the interrelations</td>
</tr>
<tr>
<td>• Integrate further government-specific adoption factors to pay attention to the characteristics of government</td>
</tr>
<tr>
<td><strong>Analysed e-Government services</strong></td>
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<tr>
<td>• Pay more attention to the specific characteristics of an e-Government service before generalising the results</td>
</tr>
<tr>
<td>• Contrast the results of the research model using different e-Government services to get e-Government acceptance factors which are independent of the services</td>
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<tr>
<td><strong>Underlying acceptance models</strong></td>
</tr>
<tr>
<td>• Base studies on e-Government adoption models developed by others which are tied to the specific needs instead of only sticking to the traditional adoption models like TAM and UTAUT</td>
</tr>
<tr>
<td><strong>Outcome</strong></td>
</tr>
<tr>
<td>• Evaluate previously developed models in different situations/extend them in order to increase their validity</td>
</tr>
<tr>
<td>• Include further practical implications</td>
</tr>
<tr>
<td><strong>Practical implication</strong></td>
</tr>
<tr>
<td>• Follow up the theoretical results with practical recommendations in order</td>
</tr>
</tbody>
</table>
### Table 4. Framework of future research needs in e-Government adoption

<table>
<thead>
<tr>
<th>Implications for future research</th>
</tr>
</thead>
<tbody>
<tr>
<td>to create awareness as well as impact for the research area</td>
</tr>
<tr>
<td>• Develop communication/marketing strategies to increase e-Government adoption</td>
</tr>
<tr>
<td>• Conduct studies with people actually working in the respective environment/using the e-Government service instead of falling back on students</td>
</tr>
</tbody>
</table>

### Conclusions and Limitations

We conducted a literature review on the acceptance of e-Government identifying 22 relevant articles in the period from 2000 to 2011 following the structured literature search process as proposed by vom Brocke et al. (2009). For structuring our evaluation, we derived a conceptual framework on the basis of Webster’s & Watson’s conceptual matrix (2002). Our aim was to give an overview of the existing research in the field of e-Government acceptance especially with regard to the identified acceptance factors. We showed how highly ranked research on e-Government acceptance is carried out. From analysing our article sample, we identified some shortcomings of existing literature and derived recommendations for future research which we synthesized into an integrated framework. In particular this refers to a subsequent testing and enhancing of proposed acceptance models from other authors. We further see the need for integrating different research designs meaning that especially qualitative and quantitative approaches should be combined in order to both test a proposed model and to dig deeper in the semantic relations of the constructs. Additionally, we argue that it is worthwhile shifting the local focus of e-Government research from North America to other countries which also possess a highly sophisticated e-Government structure. This would enable the research community to learn from best practices from a variety of countries. Although demanded by many researchers, uncovering the (objective) antecedents of subjective perceptions has hardly been done. When research aims at coming closer to practice, this step is inevitable. Giving advice to governments, for example, requires hands-on factors for influencing citizens’ attitude towards e-Government. Finally, we pointed out that almost every article claimed in its ‘practical implications’ section that communication, be it in form of advertisement or educational training, is crucial for the successful adoption of e-Government both by citizens as well as by government employees. Surprisingly, no research model exists that integrates communication in any manner. This gives rise to the need of exploring the influence of communication on the adoption of e-Government empirically by integrating it into future research models.

Of course, our research has several limitations. We only considered 20 journals to have a – in this way – enclosed set of research. We are aware of that fact that relevant literature on e-Government acceptance has been published in far more journals, conference proceedings, book sections or working papers. Integrating these outlets would be very informative. Besides gaining further insights, it might turn out that the characteristics we identified are not representative for the research community on e-Government acceptance and adoption as these highly ranked journals might lay their focus on aspects different from other publication outlets. Furthermore, we admit that the domain of e-Government has existed longer than the period we have considered. Although, our results show that most of the relevant articles were published during the last six years, it might nevertheless be worthwhile to have a look at older outcomes. Finally, we encountered that authors use many research theories other than from the field of e-Government, Public Administration or Information Systems. Therefore it would be valuable to extend the literature research to other fields within the domain of IS as well as to other directions like the social sciences.
References


