

The Role of Trust for Citizens' Adoption of Public E-Services



Bettina Distel, Holger Koelmann, Florian Schmolke, and Jörg Becker

Abstract Digital services are ubiquitous in today's world, marking it as the digital age. Public administrations are using information and communication technologies for decades now; however, public e-services are still not widely used by the intended users. Repeatedly, scholars highlight the importance of trust for the successful adoption of public e-services and much research has empirically investigated the role of trust for public e-service adoption. In face of the substantial amount of research, this chapter summarises the current debates surrounding this topic and provides empirical insights on the role of trust for public e-service use in Germany. The insights of both empirical studies, i.e. the literature review and the interviews, result in a generalised model of citizens' trust in the context of e-government.

Keywords Trust · Electronic government · Public services · Public service delivery · E-services · E-government

1 Introduction

The extensive digitalisation of the public sector gave rise to the proliferation of public e-services. Researchers and practitioners alike are interested in understanding how users respond to these offerings. Public administrations aim—amongst other things—at increasing the efficiency and effectiveness of their internal processes (Bryson et al. 2014), wherefore citizens' adoption and, ultimately, continued use of public e-services is of great importance (Distel 2020). But also from a more 'democratic perspective', e.g. when considering the facilitation of more transparent government decision processes, public administrations might have an interest in better understanding how their services—both digital and analogue—are being used. Viewed from this perspective, citizens' adoption of public services is important to

B. Distel (✉) · H. Koelmann · F. Schmolke · J. Becker
Department of Information Systems, University of Münster, Münster, Germany
e-mail: bettina.distel@ercis.uni-muenster.de; holger.koelmann@ercis.uni-muenster.de;
florian.schmolke@ercis.uni-muenster.de; becker@ercis.uni-muenster.de

understand as public administrations ‘[...] take an active role in creating arenas in which citizens, through discourse, can articulate shared values and develop a collective sense of the public interest’ (Denhardt and Denhardt 2000, p. 554 f.). In other words, public (e-)services become a (supportive) instrument with which deliberative interactions between the public administrations and the citizenry are carried out, because they facilitate, for example, access to and use of governmental information (Rose et al. 2015).

E-government has become a major research theme in the Information Systems (IS) discipline (Bélanger and Carter 2012). IS research is traditionally concerned with both the design of new, innovative artefacts and the human response to those artefacts (Hevner et al. 2004; Oksüz et al. 2016). Consequently, one major focus of e-government research is the *adoption* of public e-services by various stakeholders (Abu-Shanab and Harb 2019; Arduini and Zanfei 2014). Even though researchers have created a huge body of knowledge in the field of technology adoption in general and in e-government adoption in particular, new studies are being published regularly, because technology is becoming more complex and sophisticated and users are, therefore, constantly adapting their behaviour to these new conditions (Benbya et al. 2020).

Many researchers and practitioners alike highlight the benefits for stakeholders of public administrations and especially for citizens that arise through the supply and use of public e-services, for example, increased transparency and accountability (Carter et al. 2016), greater convenience, more control, and cost reductions (Gilbert et al. 2004). It is commonly assumed that these benefits increase the likelihood of citizens to adopt public e-services. At the same time, the use of public e-services involves considerable risks for citizens, such as loss of data to third parties (Belanche et al. 2012b), and uncertainties with regard to the outcomes of their interaction with public administrations. Against this background, scholars repeatedly highlight the importance of *trust* for citizens’ adoption of public e-services (Beldad et al. 2011). In face of risky situations, decision makers, i.e. citizens, need trust as a bypass to these risk perceptions to be able to decide and act. Especially with regard to the fact that in many Western and European countries the use of public e-services is still mostly voluntary (European Commission 2018), the role of trust for the adoption of e-services is an important topic as it might determine citizens’ choice of channel (Ebbers et al. 2016) but also the nature of interactions between citizens and public authorities (Madsen and Kræmmergaard 2015).

While many scholars have investigated the role of trust in the context of public e-service use, there is also considerable variance in our field with regard to different trust measures used (Belanche et al. 2012a; Bélanger and Carter 2008; Cabinakova et al. 2013; Horst et al. 2007), with regard to definitions of trust in the context of public administrations (Belanche et al. 2012a; Cabinakova et al. 2013), and with regard to the trust relationship under study, e.g. citizens’ trust in the e-service (Belanche et al. 2012a), in the Internet and in the government (Akkaya et al. 2013), in the public sector (Cabinakova et al. 2013) or citizens’ trust in the public administration’s ability and willingness to protect personal data (Beldad et al. 2011).

As the body of knowledge on this topic is still growing and the trust debate remains an important one with regard to the steady technological developments, this article aims at structuring the so far accumulated knowledge. Furthermore, we provide empirical insights into the role of trust for voluntary adoption of public e-services in Germany. Since the use of public e-services in Germany is not mandatory, it creates a particularly interesting case and enables us to gain in-depth insights into perceptions of both users and non-users of public e-services actively choosing their preferred channel (Distel 2020). Thus, this chapter seeks (1) to provide a condensed overview of the status quo of research on trust in the context of public e-service adoption and (2) to report on empirical insights of a qualitative interview study on the role of trust for public e-service adoption in Germany. Insights of these two studies are then translated into (3) a model of citizens' trust in the context of public e-service use.

2 Digitalisation of the Public Sector From the Citizens' Perspective

In this section, we set the scope of our research by firstly defining central terms of our work and summarising the status quo of research on the adoption of public e-services by citizens (see Sect. 2.1). Secondly, we consider the potential risks that arise for citizens through the use of public (e-)services and discuss the role of trust in interactions between citizens and public administrations (see Sect. 2.2).

2.1 Public E-Services and Their Uptake by Citizens

E-government commonly refers to the use of information technology (IT) within public administrations to exchange information between public administrations and their stakeholders (Hofmann et al. 2012). Thus, e-government may not only refer to the delivery of public services to citizens by electronic means but also to the use of IT for internal administrative processes. Thus, we use the term 'public e-service' to describe citizens' interaction with administrations through electronic channels and the term 'e-government' to refer to the digitalisation of the public sector in a more general manner. In this chapter, we understand 'service' as a process in which values are generated by both the users, i.e. citizens, and providers, i.e. public administrations, under consideration of the 'public ethos' (Lindgren and Jansson 2013). The term 'public ethos' hereby refers to '[...] a shared sense of responsibility for serving social justice and the common good, whereby both *economic* and *democratic values* are taken into account' (Lindgren and Jansson 2013, p. 167).

Scholars as well as practitioners associate numerous benefits with the use of public e-services. Gilbert et al. (2004), for example, name the opportunity to avoid

personal contact, to have more control over the process, an increased convenience in receiving the service, reduced costs, greater personalisation, and time savings as benefits arising from citizens' public e-service use. Other scholars point to the increased efficiency of transactions (Ho and Ni 2004), to the faster processing of requests (Becker et al. 2011), or the better access to public services (Verdegem and Verleye 2009). These and other factors are repeatedly linked to the citizens' intention to and actual use of public e-services in that they are conceptualised as enablers of use or success factors (Hofmann et al. 2012). Despite these benefits, the adoption of public e-services is still on a rather low level in many European countries. For example, only 59% of the German citizens used the Internet for interactions with public authorities in 2019 (Eurostat 2020a) and even less citizens (21%) used the Internet to submit completed forms where possible (Eurostat 2020b). In Germany, the reasons for citizens' non-adoption of public e-services are manifold: They pertain to the services offered online (Scheiber et al. 2019) and the maturity of public e-services (Distel and Becker 2018) or to citizens' perceptions of public e-services as being complicated and requiring personal interactions (Distel 2018). One major impediment to citizens' adoption of public e-services that is repeatedly discussed by scholars is potential risks and risk perceptions (e.g. Bélanger and Carter 2008; Beldad et al. 2011; Whitmore and Choi 2010).

2.2 Risks and Trust in the Context of Public E-Service Use

In this chapter, we define risk as the '[...] perceived probability of loss, as interpreted by a decision maker [i.e., the citizen] ...' (Rousseau et al. 1998, p. 395). In this sense, risks refer only to the potential, negative consequences of an action performed by the citizen, for example, of using public e-services. It is important to note that there is not necessarily a congruence between actual risks and risks as perceived by citizens. When using public e-services, sensitive personal data are processed. Already in 2004, Milne et al. (2004) have summarised three general risks of online environments that also apply to our context: (1) Personal data is stored on the citizens' computers and may be compromised or get lost there, (2) personal data can be compromised during the transfer, and (3) personal data may be compromised or abused when stored by the public administration. In addition to these data security risks, citizens may perceive the risk of becoming 'transparent citizens', which means that public administrations can create a full digital copy of individuals through their personal data (Akkaya et al. 2013). This aspect pertains to data privacy and also includes aspects such as unintended use of personal data within public administrations or unauthorised exchange of data. From the citizens' perspective, there might be also risks that pertain more to the service and service delivery rather than the technology used. Interacting with public administrations through electronic means reduces the space for personal interactions and negotiations of the personal case, which might be important to citizens (Madsen et al. 2019). The mechanisation of processes requires correct entries—faulty or incomplete information may prevent

citizens from receiving the benefits they are entitled to. Thus, both the perceived complexity of public services and a lack of experience or habituation with these services may yield risks for citizens when interacting with public administrations electronically.

In the face of substantial risks, individuals often need mechanisms to deal with these situations and to remain capable of acting. One of these mechanisms can be trust (e.g. Rousseau et al. 1998). Trust is defined as a '...psychological state comprising the intention to accept vulnerability based on the positive expectations of the intentions or behaviors of another' (Rousseau et al. 1998, p. 395). Vulnerability refers to the citizen's inability to monitor or control the behaviour of public administrations, whereas 'intentions or behaviours' refer to the administration's willingness to protect and secure citizens' private data, to handle data in accordance with existing legislation, to process personal data only for the purpose of service delivery, and to act in the citizens' best interest.

Trust in the context of e-government and public administrations is studied from various perspectives. As Bouckaert (2012) suggests, there are three types of trust relations between public administrations and their stakeholders: trust within the public sector, trust of the public sector in organisations and citizens, and trust of citizens and organisations in the public sector. These trust relations are also studied within e-government research. Snijkers (2004), for example, studies the role of trust for cooperation *between public agencies*. In the context of citizen involvement and interactive government, especially the public sector's trust in its citizens is studied (e.g. Moyson et al. 2016; Yang 2005). However, as can be seen in the accounts above, the major debate revolves around the role of trust for citizens' adoption of public e-services. This line of research has its roots in the research on technology adoption and here, trust is conceptualised as an antecedent to adoption of e-services (e.g. Akkaya et al. 2013; Teo et al. 2008; Warkentin et al. 2002). Specifically, scholars suggest that citizens' *trust in the government* will increase their likeliness to adopt public e-services. Yet, there are also researchers investigating the impact of public e-services on citizens' trust in the government, thereby studying the opposite direction of this effect (e.g. Bannister and Connolly 2011; Welch et al. 2005). As the body of knowledge on this topic is still growing and the trust debate remains an important one with regard to the steady technological developments, we aim at reviewing the status quo of research on the interplay of trust and public e-service adoption. Furthermore, we provide empirical insights into the role of trust for public e-service adoption in Germany. The next section outlines the chosen methods for data collection and analysis.

3 Method

In order to uncover the status quo of e-government research on trust and citizens' adoption of public e-services, we conducted a structured literature review, following the suggestions by Webster and Watson (2002) and Vom Brocke et al. (2009, 2015)

(see Sect. 3.1). In addition, we report on yet unpublished results of a qualitative interview study (see Sect. 3.2).

3.1 Structured Literature Review

To conduct the structured literature review (SLR), we first searched the databases Scopus and Web of Science (WoS) for potentially relevant articles. The search was conducted in May 2019. To ensure that all relevant articles are included in this analysis, we decided to search for journal articles, conference proceedings, books, book chapters, and editorials containing any combination of the terms shown in Table 1 in either their title, abstract, or keywords.

Furthermore, we only considered articles written in English. This approach provided us with 568 entries from the Scopus database and 659 entries from WoS, giving us 1227 potentially interesting entries. After deleting duplicates, 1095 articles remained for further analyses. For these, we checked the abstracts for a fit to our topic. This was done independently by two researchers according to a list of inclusion and exclusion criteria. In essence, we kept any article dealing centrally with citizens’ adoption and/or use of public e-services and *trust*. We excluded any article discussing either public e-service adoption or trust only in passing and those articles not taking the citizens’ perspective. A third researcher functioned as a tie breaker, where needed. This procedure resulted in 321 articles fitting our topic with 278 of these available to us for further analysis.

The remaining articles were analysed according to a predefined coding scheme. At first, the overall fit of the articles to our topic was checked. Second, we collected some metadata, such as the year of publication and publication type. Third, we looked for the trust definitions used and the existence of a trust discourse within the

Table 1 Configuration of the search string

Databases	E-government terms	Trust terms	Adoption terms
Scopus, Web of Science	‘e-government’ OR ‘e-gov’ OR ‘electronic government’ OR ‘e-government’ OR ‘online government’ OR ‘digital government’ OR ‘public online service’ OR ‘online government’ OR ‘digital public service’	‘trust’ OR ‘distrust’ OR ‘mistrust’	‘adoption’ OR ‘acceptance’ OR ‘intention’ OR ‘use’ OR ‘usage’ OR ‘rejection’ OR ‘resistance’ OR ‘non-adoption’

articles. Fourth, we coded relevant information about the methods applied; and last, we analysed the conceptual parts of the articles with regard to which entity was defined as the trustor and the trustee. After this in-depth full text analysis, 199 articles were still considered relevant and the results of the analysis are reported in Sect. 4.1.

3.2 Interviews

Besides the SLR, we used yet unpublished results of a previous interview study (see Distel 2018) to generate insights into how citizens perceive public administrations and public (e-)services. In particular, we analysed the interviews with regard to the citizens' understanding of trust and the importance they ascribe to trust in the context of interactions with public administrations. We opted for qualitative interviews as they can generate in-depth insights into citizens' perceptions and behaviours without imposing any interpretation upon the respondents (see Hendriks et al. 2020 in this volume).

The study was conducted in Germany with 18 citizens aged between 23 and 63 years. The interviews were semi-structured and covered a wide range of topics. The guideline was divided into five broad sections (Distel 2018), asking about the citizens' general use of digital technologies and e-services, inhibitors to technology use, their general image of public administrations, and inhibitors and enablers to the use of public e-services. The interview was concluded with an open question, giving the interviewees the opportunity to highlight important aspects of the conversation or even raising new topics (see Table 2 for an overview of the interview guideline and exemplary questions).

The interviews were transcribed and analysed inductively using the approach on qualitative content analysis proposed by Mayring (2015). With an inductive qualitative content analysis, the coding scheme is developed from the material. First, a small part of the material is read—in this case, we started with four interviews—and preliminary themes or categories are defined. Second, these preliminary categories are applied to another part of the sample. In our sample, we analysed two further interviews, refined, omitted, and summarised existing themes and categories, and developed new ones. Third, the resulting coding scheme was re-applied to the first interviews and tested on a new set of interviews. This iterative process is repeated until no further information arises. In our case, the resulting coding scheme consisted of 80 codes and five super-ordinate categories. In this chapter, we only report on the analysis of five trust-related codes. The transcribed interviews were re-analysed with regard to these aspects. All questions and direct quotes from the interviews are translated from German to English. Further details on the method for data collection and analysis as well as on the results of the overall interview study are given by Distel (2018).

Table 2 Structure of the interview guideline and exemplary questions

Block	Exemplary question
General use of digital technology	Do you use electronic services like online banking or online shopping? How important is the Internet in general for your everyday life?
Barriers to adoption of digital technology in general	What are or what could be reasons for you to use an e-service? Are there situations, where you are concerned when using the Internet? Have you or friends of yours made negative experiences with the use of e-services?
Image of public administrations	How efficient do you think are public administrations in general? How citizen-friendly do you think public administrations are in general? How often have you had contact with public administrations during the last year?
Barriers and enablers to e-government adoption	What could be reasons for you to not use such (public e-) services? On the contrary, what are or what could be reasons for you to use such services? In how far do you think are public administrations able to provide secure and functioning e-services?
Completion of the interview	Do you have any questions left or are there issues you want to elaborate on?

4 Findings

In this chapter, we present the core findings of the SLR (see Sect. 4.1) and the interview study (see Sect. 4.2). Based on both analyses, we derive a generic model of trust in the context of public e-service use, which is described in Sect. 4.3.

4.1 Results from the Structured Literature Review

As laid out in Sect. 3.1, 199 articles remained in our final sample. Within one article, multiple studies or samples can be reported, wherefore we differentiate in the following sections between *articles* (199) and reported *studies* (213). The *articles* are published between 2004 and 2019, with the majority being published between 2011 and 2018. The vast majority of articles are articles in journals (146), far less publications are conference proceedings (51), book chapters (1), and encyclopaedia entries (1). Of the analysed articles more than 89% are empirical (178) and merely 21 articles are not empirical. Again, the majority of empirical *studies* use quantitative research designs (165), far less are qualitative in nature (19) or make use of mixed methods designs (8). Not surprisingly, most of the quantitative studies analysed here use surveys as their main instrument (see Table 3). This overall picture mirrors to a

Table 3 Methods used across all studies ($n = 213$)

Method	Frequency
Survey	165
(Qualitative) case study	8
Literature review	7
Interview	7
Experiment	2
Other	6
<i>Studies not reporting any method</i>	18
<i>Total</i>	213

Table 4 Trust definitions used in the analysed articles

Source	Frequency
Mayer et al. (1995)	14
Rotter (1967)	10
Rotter (1971)	7
Warkentin et al. (2002)	4
Bélanger et al. (2002)	4
Rousseau et al. (1998)	3
Sitkin and Roth (1993)	3
Benamati et al. (2010)	3
Moorman et al. (1993)	3
Bélanger and Carter (2008)	2
McKnight et al. (2002)	2
Zucker (1986)	2
McKnight and Chervany (2001)	2
Other definitions from literature used once	23
Own definitions given	12

great extent the status quo of research in our field (e.g. Ben Rehouma and Hofmann 2018; Distel and Ogonek 2016).

More interesting in the context of this article, though, is the conceptualisation of trust within the identified articles and studies. We analysed whether the authors debated different views on trust and delineated the current discourse, whether and how they defined trust, and whom they conceptualised as trustor and trustee. Note that within one article more than one trust definition can be used and more than one trustor or trustee can be named, wherefore the number of definitions, trustors, and trustees is not equal to the total number of articles and studies. We find that only 33 articles include a discussion of the concept of trust, i.e. they contrast different perspectives and definitions. Less than half of the articles (88) give a definition of trust; 111 do not define trust at all. Table 4 lists all trust definitions used in the analysed articles.

In total, we identified 36 different definitions from literature of which the definition given by Mayer et al. (1995) is most often used; followed by definitions given by Rotter (1967, 1971). It is noticeable that the most often used definitions are not context-sensitive, i.e. they are general definitions of trust and not adapted to the

Table 5 Trustors mentioned across all *studies*

Trustors	Frequency
Citizens (not further specified)	147
Citizens (specified, e.g. citizens with e-government experience)	33
Students	14
Taxpayers, tax practitioners	4
Individuals (not further specified)	4
Internet users with e-government experience	3
Individuals with Internet access, Internet users	3
Lecturers	1
Social activists	1
Internet users without e-government experience	1
The public	1
Client	1
Tourists	1
Voters	1
Non-users	1

e-government context. Furthermore, all of those definitions used two or more times treat trust from a socio-psychological perspective, which accounts as well for the twelve definitions newly developed by authors. Regarding these definitions, only four are tailored to the e-government context (e.g. Papadomichelaki and Mentzas 2011).

The overview given in Table 5 lists all trustors as conceptualised in the analysed studies. The analysis reveals that the majority of the studies does not distinguish between the various categories of citizens or their defining characteristics. Some studies differentiate, for example, citizens with and without e-government experience or focus on tax payers. However, a more nuanced treatment of the citizen as is called for by some scholars (Distel and Becker 2017; Distel and Lindgren 2019) is yet missing.

Regarding the trustees (see Table 6), we find that most of the studies either conceptualise e-government services and systems or the e-government providing agency, i.e. public administrations and governments, as the trustee. Seven studies did neither implicitly nor explicitly define who the trustee is. Moreover, the analysis reveals that some studies define a trustor but not a trustee. In contrast to the trustors, which are all conceptualised as individuals or groups of individuals, the trustees can be summarised in four groups. The *first* group of studies considers governments and public authorities, i.e. organisations, as trustees. A *second* set of studies focuses on the technological infrastructure, i.e. the medium through which public e-services are offered. Here, authors either study public e-services or e-systems in their entirety or focus on specific, mostly local services or systems. A *third* group of studies treats intermediaries and service providers as trustees. Finally, there are a few studies that cannot be grouped in any of these categories (group *four*). For example, one study focuses on trust in government information, and one study covers trust in other

Table 6 Trustees mentioned across all *studies*

Trustees	Frequency
E-government/mobile government services	105
Government, public administration	77
Internet, online service	35
E-voting systems and services	5
Multiple, not further defined	4
Government website	4
System, computer	4
Agents providing e-government, intermediaries	3
Institutions (not further specified)	3
Cloud computing/cloud computing (or other service) providers	2
User profiling	1
Relationship with other users	1
Smart identity card, eID	1
Government information	1

service users. Across all four groups it can be observed that the trustee is either a specific instance or is treated in general terms.

It is noteworthy that only one out of 200 articles explicitly addresses and defines distrust; a handful of articles deal with distrust in passing. Apparently, e-government research does—so far—not debate users' distrust and its consequences for the use of public e-services.

Four major conclusions can be drawn from the SLR.

- Most of the research on e-government and trust is empirical and uses quantitative research designs.
- Only very few articles debate different views on trust. Less than half of the articles define trust, however, we find as many as 36 different definitions of trust in our field.
- There seems to be agreement in the conceptualisation of the trustors as individuals; only a few studies refer to generalised trust, such as public trust.
- The trustees conceptualised in the analysed studies fall in four groups, i.e. governmental agencies, technological infrastructure, intermediaries & service providers, and other. Regarding the public authorities (group 1) and the technical infrastructure (group 2), authors either treat these trustees in general or focus on specific entities.

4.2 Interview Results

This section summarises the trust-related insights from the qualitative interviews. Before presenting these specific insights, the overall impression of the interview parts dealing with trust is described, in order to set the context.

Basically all respondents reported their perceptions of public administrations from personal experience, without referring to, for example, media coverage. Partly, these experiences were reported in relation to specific incidents and partly, citizens referred to more generalised experiences across different situations. It is also noticeable that the citizens only reported their own experience and did not refer to the experiences or opinions of others, e.g. family or friends. The in-depth analysis of the qualitative interviews reveals that trust is an issue for citizens and that German public administrations can profit from a profound level of generalised trust as the following quote suggests.

I think you have a fundamental trust in the administration that they handle the data reasonably (Interviewee B).

In total, we identify five trust-related themes (see Table 7) in our interviews. These themes may be either positively or negatively connoted, i.e. they either describe a state of trust or a state of no trust. Following Lewicki et al. (1998), we understand a lack of trust and distrust as distinct constructs.

The *first theme (trust)* includes statements with which citizens express a general and rather diffuse trust towards public administrations. This form of trust relates to general perceptions and expectations regarding the public administrations' behaviour and might be seen as a result of cumulative experiences.

The *second theme ((no)trust in public administration)* refers to the public administrations' perceived competence to provide e-services. Some of the interviewed citizens expressed a preference for private companies as developers and providers of public e-services. This preference was mostly based on the perception that public administrations lack the necessary (technical) competence to develop and provide up-to-date, functioning, and secure e-services. Interestingly, there were about the same number of respondents who argued the exact opposite and argued for public administrations as developers and providers. In their view, administrative services should not be outsourced to private providers for data protection reasons.

With regard to data security and privacy aspects, some citizens stated that they saw no difference between public e-services and services provided by conventional means (*third theme (no differentiation online vs. offline)*). From their perspective, both analogue and digital channels have the same level of risk, though maybe in different ways. Interestingly, only one interviewee related this statement to the transmission channel, i.e. digital transmission and postal transmission. All other interviewees referred to the handling of data by public administrations and, more interestingly, to the amount of data administrations have about their citizens as the following quote illustrates: 'And I think you can assume that the city knew a lot about the people even before the time of the computer, what their assets were, what they earned; [they knew that] through the tax cards, which were still issued by the city at that time' (Interviewee P). This aspect underlines the importance of the provider, i.e. the administration, as a trusted party.

Closely related to the preceding aspect is *theme four* (no trust in data security and privacy measures). Most citizens were concerned about the handling of their private data when using digital technologies in general. However, when it came to public

Table 7 Overview of trust-related themes

Theme	Definition	Representative quote
Trust in public administration (not specified)	The citizens express trust in public administrations, without explaining this trust in more detail or relating it to a specific aspect of public administrations and public (e-)services	Well, I actually already trust [administrations]. It's a reputable provider I know. Actually, there shouldn't be any problem why I wouldn't take advantage of [public e-services] (Interviewee A)
(No) trust in public administration as a provider of e-services	Citizens do (not) trust public administrations with regard to their competence to provide e-services and would (not) prefer private service providers over public administrations	[No trust] I do not think that this [public administrations as providers of e-services] is important at all, because in my experience, public administrations then unfortunately do not have the competences and personnel capacities to implement this themselves in a reasonable way. Private service providers are obviously miles ahead (Interviewee G) [Trust] No, I wouldn't have much confidence in [private providers], because I wouldn't know where my data would end up. I would have to worry about that. (Interviewee C)
No differentiation online vs offline	Citizens do not perceive any difference in data security risks between public e-services and on-site services.	In the end, data is transmitted, no matter by what means. [It] depends on how it is handled within the public authority. (Interviewee D)
Trust in data security and privacy measures	Citizens do (not) trust public administrations with regard to data protection and security, i.e. they assume that data protection and security are (not) sufficiently guaranteed. This includes, in particular, the citizens' opinion on the way in which administrations handle the users' personal data and the belief that structures are in place that prevent data abuse and theft.	[Trust] I do believe that it [data security and privacy standards] will be fulfilled. They have to be, because these are legal requirements. (Interviewee H)
(No) integrity	Citizens express how they perceive the public administrations' integrity with regard to public e-services. Here, integrity is understood as the extent to which citizens perceive a congruence of interests and/or values between them and the administration. This category also includes statements that describe public administrations as being serious and respectable	[Integrity] Well, I do believe that public administrations are concerned to satisfy their citizens in their requests and problems and to give good advice (Interviewee S) [No integrity] I think the greatest interest they have is not to make it convenient for the citizen, but to reduce staff through digitisation (Interviewee E)

administrations, none of the interviewees described them as not willing to adequately handle and process citizen data. Most of the interviewed citizens instead believed that public administrations are respectable and, moreover, legally bound to carefully handle citizens' data. Some even attributed an exemplary function to public administrations.

Finally, we identified a *fifth theme ((no) integrity)*. Thereunder fall statements that pertain to a congruence of interests, i.e. citizens would assume that public administrations have the same, similar, or different interests when providing e-services.

Summarising the insights gained through the in-depth interviews leads to the following propositions.

- Citizens either think about specific incidents or report their perceptions in a generalised form, across different situations.
- Citizens' trust relates to both the public administration as a provider of public (e-) services and more technical issues such as data security.
- As far as trust in the context of administrations and e-government is concerned, the opinion of other citizens and peers does not seem to play a significant role.
- Citizens ascribe an exemplary function to public administrations when it comes to the *handling* of private data. However, they do not necessarily view public administrations as being *technically competent* to provide e-services.

4.3 Model of Citizens' Trust in the Context of E-Government Use

The results of the SLR and the qualitative interviews can be summarised in a generalised 'model of citizens' trust in the context of public e-service use' (see

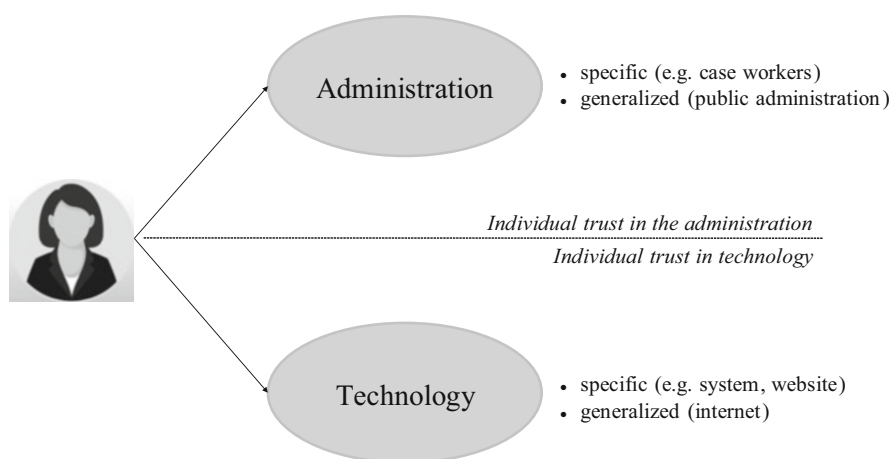


Fig. 1 Generalised model of citizens' trust in the context of e-government

Fig. 1). As can be seen in the accounts above, most authors understand trust as an individual's quality either in relation to a specific system or class of systems (lower part of Fig. 1) or in relation to the service providing agency and its employees (upper part of Fig. 1). This finding is in line with the broader IS research on trust, which commonly differentiates trust in the medium and trust through the medium in the provider (Oksüz et al. 2016). This notion is also mirrored in the interviews in which citizens mostly related their perceptions to the public administration in general, specific incidents they remembered, and more technical aspects such as data security and privacy aspects. Thus, we conclude that users of public e-services trust the technology and trust the service providing agency. Regarding users' *trust in the technology*, we differentiate between *generalised trust*, which mainly refers to the Internet as the infrastructure used to access public e-services, and *specific trust* in a given system or service. Regarding users' *trust in the service provider*, we differentiate between *generalised trust* in public administrations and *specific trust* in case workers, public agents, and other employees. The articles analysed through the SLR suggest that all four forms of trust are pivotal for the users' decision to either use or reject public e-services. They may exist independently but may as well influence each other. For example, trusting local staff may positively influence the users' general trust in public administrations. This notion is also supported by the analysis of the qualitative interviews: While many citizens stated that they overall trust public administrations and ascribed a role model function to these agencies with regard to the handling of private data, they doubted—at the same time—the technical competences and capacities of public administrations.

5 Discussion

The presented findings of our research include implications for practice, as presented in Sect. 5.1, and for research including future research opportunities, as highlighted in Sect. 5.2.

5.1 Implications for Practice

Our findings result in several implications for practitioners in public administrations. Trust, in general, seems to be an important topic related to the adoption and therefore use of both analogue and public e-services. In terms of e-services, however, citizens differentiate between trust in the administration as a provider of the service and trust aspects associated to the used technology. Trust is important and the interviews indicate that citizens trust both the provider in general and specific employees. However, citizens' trust is not uncritical or naive as the differentiated perceptions of integrity and data security aspects indicate. Public administrations are the executing organs in a democracy and are, thus, accountable to the public. *Thus, we*

suggest that public administrations strategically manage citizens' trust. Several scholars point to the fact that neither blind trust nor outright distrust is a desirable state; instead, they argue for a balanced attitude, where citizens are reflexive about their trust and remain, at the same time, vigilant towards the behaviour of public administrations and governments. Citizens in this state may guarantee the continuation of a political system by constantly challenging existent mechanisms (Krouwel and Abts 2007; van de Walle and Six 2014). Strategically managed trust may then not only become a mechanism through which the use of public e-services can be increased. It can as well be used to enhance the development of public e-services by focusing more on the citizens' needs and demands.

Though, if public administrations aim at increasing citizens' trust in the e-service itself (trust in the technology), there are a number of ways for improvement. While generalised trust in government is an asset to build on, public administrations are not perceived as being entirely competent to provide public e-services. Moreover, most of the interviewees were particularly aware of data security and privacy issues. From their perspective, the major risk when using public e-services is the handling of sensitive data by public administrations. *Thus, we suggest that public administrations need to ensure data privacy and security standards as well as they need to properly communicate these measures to the users.*

Finally, citizens seem to base their perceptions of public administrations mainly on their own experiences and specific incidents rather than on peer opinions or media coverage. Therefore, positive experiences with public e-services could increase the overall willingness to use public e-services but might as well positively influence citizens' overall image of public administrations. *Thus, this research echoes former calls for more consistency of the provided e-services and more comprehensive e-services.*

5.2 Implications for Research

Besides the practical implications, our research shows some interesting points for researchers as well.

First, the review of existent research on the role of trust for citizens' use of public e-services indicates that the overwhelming majority of articles neither define trust—although it is empirically measured—nor do these articles revisit the e-government-related trust discourse. This finding is even more striking when considering how citizens perceive public administrations and assess their own trust in the context of public e-service use. Most interviewees reported a quite nuanced understanding of trust; however, neither the general definitions of trust (e.g. Mayer et al. 1995) as employed in many articles nor the standardised quantitative measurement of trust account for these intricacies. Moreover, a thorough grounding in existent trust discourses could increase the comparability and degree to which study results can be replicated. *Thus, we suggest that e-government researchers work towards theoretical integrability by carefully evaluating prior research on trust and public*

e-service adoption. This requires more transdisciplinary research, integrating findings from the IS discipline (how are technologies used, why are technologies rejected), from public administration science (what role trust plays for a society/political system), and e-government research (what role do trust and distrust play for the acceptance of public (e-)services and, more generally, public sector digitalisation).

Second, our studies indicate that distrust does not play a role so far, neither in literature nor for citizens' perceptions and adoption of public e-services. Still, research indicates that trust and distrust are linked concepts and play both a vital role in democracies and for the stability of a political system (Krouwel and Abts 2007; van de Walle and Six 2014). In how far the use of public e-services is impacted by both trust and distrust in the public administrations and the transmitting medium should be studied in order to better understand the current phenomenon of low adoption/non-adoption of e-services. *Thus, we suggest to broaden the scope of research and explicitly discuss the role of distrust for public e-service use and the interplay of trust and distrust in this context.*

Third, many of the articles analysed here conceptualise citizens as trustors but do not provide any detail on who these citizens actually are and in what role they interact with public administrations. Scholars repeatedly discuss the different roles in which citizens can interact with public administrations (e.g. Thomas 2013) and this notion is increasingly discussed in e-government research (e.g. Distel and Becker 2017; Distel and Lindgren 2019). *Thus, we not only recommend to explicitly define trustors and trustees but to also discuss characteristics of citizens as trustors and to better differentiate the different roles citizens can take in interactions with public administrations.*

Fourth and last, we propose a generalised model of citizens' trust in the context of public e-service use. This model is based—as many other studies and models as well—on a socio-psychological view on trust. While derived both from existent e-government literature and empirical insights into citizens' perceptions and behaviours, this model has yet to be tested on a larger scale. *Thus, we suggest that future research critically assesses the value and applicability of the proposed model.* This suggestion includes not only the operationalisation of the model, but also the discussion of the model's value for e-government theory.

6 Conclusion

While this article yields some important insights, our chosen approach is not without limitations. Due to the nature of a SLR on such a large body of knowledge, we could not go into increased detail with all articles and their potentially more differentiated findings. Also, the responses of our interviewees were not free of contradictions. This is common in qualitative research and the tensions between statements of different individuals highlight complexities that remain otherwise in the dark.

However, these tensions need to be further investigated in future research, since it will be interesting to understand

- what factors either lead a citizen to trust the public administration or distrust it,
- what factors lead a citizen to perceive public administrations as a reliable e-service provider,
- and why some citizens doubt the technical competences of public administrations.

This requires a more detailed view of who citizens are, how and why they interact with public administrations and other public entities.

Besides limitations arising from the used methods, the proposed model of e-government trust comes with a few limitations as well. It still needs to be tested in real life environments and arose, partially at least, from interviews conducted in the context of German e-government. Thus, it is not necessarily transferable to other contexts one-on-one and should be carefully adapted. Also, our model does not yet include interactions between the four forms of trust. These should be systematically integrated. Furthermore, since our model is based on the conducted interviews and SLR, it does not include distrust as a separate construct, although scholars point to its importance for public administrations. Hence, further research is needed to integrate distrust into this model. In addition, separating the degree of influence each part of the model has on the resulting trust in e-Government in later studies might be useful to further increase the understanding of the results and resulting implications for research and practice.

This article set out to provide a condensed overview of current research on trust in the context of public e-service use, to report on findings of a qualitative interview study on citizens' perceptions and adoption of public e-services, and to provide a generalised model of citizens' trust in the context of e-government. The results of the qualitative interviews suggest that trust is important and a complex construct; however, e-government research does not account for this complexity so far as trust is seldom defined or different views on trust contrasted. Moreover, we find that distrust is neither studied in relation to public e-service use nor do citizens report on distrust in the context of public administrations. Still, many scholars point to the importance of distrust in this context, wherefore more research into this topic is needed.

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