Arias, María Isabel; Maçada, Antonio Carlos Gastaud

DIGITAL GOVERNMENT FOR E-GOVERNMENT SERVICE QUALITY: A LITERATURE REVIEW

11th International Conference on Theory and Practice of Electronic Governance – ICEGOV

4, 5 y 6 de abril de 2018

Digital Government for E-Government Service Quality: a Literature Review

María Isabel Arias
Universidad Nacional del Sur
San Andrés 800, Bahía Blanca
Argentina
isabel.arias@uns.edu.ar

Antônio Carlos Gastaud Maçada
Universidade Federal do Rio Grande do Sul
Rua Washington Luiz 855, Porto Alegre
Brazil
acgmacada@ea.ufrgs.br

ABSTRACT[1]

This investigation aims to synthesize related work in the field of e-Government service quality. The method is based on a qualitative approach in two steps: 1) Identification of related articles on e-Government service quality and 2) Content analysis of these articles. The findings show an integrative view of 48 articles, classified in 28 investigations, which propose competitive models to assess e-Government service quality as a final dependent variable composed of different independent variables. The relevance of this work relies on an integrative view of these models that hardly existed before in the literature.

CCS CONCEPTS

• **Applied computing~E-government**

KEYWORDS

Digital Government, e-Government service quality, public service quality

1 INTRODUCTION

According to Bertot, Estevez, and Janowski [14], Information Systems (IS) have transformed the delivery of public services around the world and have given rise to new innovations in the provision of digital public services. For the United Nations, IS are increasingly being used to engage people in decision-making processes and embrace innovation in public service delivery [85].

Digital Government helps in achieving trust in government, social inclusion, community regeneration, well-being, and sustainability [34]. Thus, Digital Government is a clear example of how society is transforming with digital innovations.

In fact, for digital innovations to "*truly transform the public sector into an instrument of sustainable development, efficiency in service delivery must be also coupled with social equity and ensuring that all people can access quality services*" [85 p. iii]. This highlights the significance of public service quality to achieve sustainable development.

Ultimately high-quality public services will enhance public value [50,60]. Consequently, it is worth studying the antecedents that may have a positive influence on public service quality. However, it has been affirmed that "*quality of governmental websites are frequently used in practice, but are not often based on sound research*" [25 p. 391].

To overcome this problem researchers have recently conducted literature reviews with the intention of proposing related models of e-service quality for the public sector. Tan, Benbasat and Cenfetelli [83] present a comprehensive summary of the literature on e-service quality in order to delineate e-Government service quality into aspects of Information Technology (IT) mediated service content and service delivery. Fath-Allah et al. [26] present a comparative analysis of e-Government quality models, considering which are based and which are not based on ISO standards, in order to propose guidelines to develop a new e-Government portal quality model. Sá, Rocha and Pérez Cota [73] systematize relevant bibliography on the quality of traditional, electronic and e-Government services in order to develop a model that evaluates the quality of local e-Government online services.

However, none of these articles builds on each other. In fact, the authors do not even cite each other, thus failing to recognize the accumulated knowledge in the field of e-Government service quality. We believed that this issue was due to the fact that the articles were developed in a contemporary period, but

---

surprisingly we further corroborated this issue in other articles. Hence, we realized there is an abundance of literature on e-Government service quality that has not been systematically structured. This fact is further corroborated whit the results of this study.

Similar to the entire field of IS research [88], there are few review articles on e-Government service quality because e-Government field of knowledge: 1) Does not have journals exclusively devoted to literature review articles; 2) Is a relatively young field of study [47]; 3) Is an interdisciplinary field colonized by researchers from different disciplines, who bring with them their various accumulations of knowledge [36] and theories from several areas; and 4) Has few theories of its own [13,36,67,68,89].

With this initial concern, we aim to conduct a comprehensive literature review on e-Government service quality. In this context, this paper tries to answer the following questions: 1) How have researchers studied IS impact on public service quality?; and 2) How has the dependent variable public service quality been defined and operationalized in terms of independent variables so as to measure IS impact on it?.

The method is based on a qualitative approach, which followed the recommendations by Webster and Watson [88], in two steps: 1) Identification of related articles on e-Government service quality and 2) Content analysis of these articles. Hence, we conducted a literature search using Web of Science platform and complemented it with a traditional literature review as we manually went through the articles' references and citations. Then the 69 articles found were carefully read.

The findings further focus on 48 articles, classified in 28 investigations, which propose models to assess e-Government service quality as a final dependent variable composed of different independent variables. We conclude that an integrative view of these models hardly existed before. We further argue for a need to explicitly define the variables analyzed and systematically investigate the related research in the domain before affirming that e-Government service quality has been "hardly" studied.

This paper responds to the call of developing more theory-based research in e-Government as a field of study and by topic areas [80]. In this sense, the literature review and qualitative analysis applied in this paper were used to develop a coherent summary of previous research main findings [13].

This paper opens with the literature review related to this research. Subsequently, it provides the methods applied in order to obtain the results discussed in the following section. Finally, the paper concludes with final remarks, comprising contributions, limitations and proceeding steps.

2 RELATED WORK

2.1 E-Government and Digital Government

E-Government has become a global phenomenon [41] and has been defined in many different ways in the literature. These definitions have a common ground as they use properties of e-Government to describe it as a tool that supports the exchange of information between different stakeholders and administrations based on IS [39].

We define *e-Government* as the use of IT in government operations, including its effects on public service delivery, citizens' satisfaction and democratic standards [31,38,52,57]. Hence, researchers study the impact of IS, IT and Internet in government operations and public service.

IT is a main tool for government reform, assuming that public managers use IT for further rationalization of governmental processes [89]. Although government's worldwide efforts on e-Government projects introduced some changes (like customer-orientation, decentralized decision-making, and performance management, among others), only public sector innovation with digital technology results in Digital Government [14].

Digital Government is "*a government that is organized increasingly in terms of virtual agencies, cross-agency and public–private networks whose structure and capacity depend on the Internet and Web.... The virtual agency, following the Web portal model used in the economy, is organized by client*" [31 p. 4].

Actually, since the concept of e-Government was first introduced by the US National Performance Review, it's understanding and practice have evolved to Digital Government to "*reflect how governments are trying to find innovative digital solutions to social, economic, political and other pressures, and how they transform themselves in the process*" towards "*more complexity and greater contextualization and specialization*" [43 p. 221].

In fact, government organizations are under pressure from various factors (e.g. economic, social and political) and respond to such pressures by innovating with the IS available [43]. For these reasons new digital innovations are gradually being assimilated by the public sector and are in the process to be institutionalized for new public services practices [14].

These policies are conceived to bring services closer to end-users through, for example, citizens interactive engagement using digital innovations [76] such as Web 2.0 and mobile applications. With these IS now it is possible to provide multi-service centers and diverse service delivery channels [14], moving government organizations to a service and self-service approach [23].

Following these trends of change in the provision of public services using digital innovations, e-Government research has rapidly moved from the study of websites development and stages of growth [52] to the current trendy topics of open data [44–46] and smart services and cities [17,30,55,58]. However, we must debate whether these digital innovations truly increase the quality of public services to transform society with them.

In this sense, the literature shows the evolution of e-Government services studies from an initial focus on website development to improve customer service [38] to more general e-services [7]. However, early studies showed that even though e-Government adoption was growing rapidly in respect of local website development, the growth of integrated and transactional e-Government was much slower [57]. This implied deficits in terms of information and service quality as websites were mostly designed for administrative purposes and not for meeting citizens' needs, thus delaying the delivery of high-quality public services.

2.2 Public Value and E-Government service quality

Because of the issues highlighted in the previous section, researchers should move from IS adoption studies to value-based studies in order to address what is the value of e-Government to citizens and agencies in improving government efficiency, transparency [13] and service quality. Indeed, digital innovations should be studied in the broader light of public value creation [23].

Public value is defined as the value that citizens and their representatives seek in relation to strategic outcomes and experiences of public services [54]. Digital innovations in public services need to deliver public value and be valued because a key to innovative IS in the public sector is that they need to deliver common good for government stakeholders and be perceived as valued by citizens, communities, governments, and industry [14].

According to Kearns [50], *public value of e-Government* is defined as the value created for citizens by governments with IT use and can be assessed considering three areas: outcome achievements, development of trust in public institutions and high-quality public services. Following this line of thought, Pang, Lee, et al. [60] claim that public service delivery capability is one of the organizational capabilities that mediate the relationship between IS resources and public value. For them, public value is enhanced when a government improves its public service delivery capability, in terms of more quantity or better quality of public services, given the available resources.

Moreover, skeptical researchers cannot rule out the possibility that digital innovations in government agencies may improve their cost efficiency by compromising the quality of public services [60]. Actually, an investigation showed that in UK Inland Revenue, Customs and Excise and Department of Social Security a £1.143 billion efficiency saving reduced tax collection and adverse impacts on service quality and responsiveness to citizens, thus generating negative impacts on public value [23]. Hence, when assessing public value, researchers need to examine whether digital innovations improve public service quality [50].

In this context, this paper aims to analyze and synthesize related work in the field of e-Government service quality. Tan, Benbasat and Cenfetelli [82 p. 1] define *e-Government service quality* as "*the extent to which an e-government website facilitates the efficient delivery of effective public e-services to assist citizens in accomplishing their governmental transactions*". Alanezi et al. (2010) extend this definition to add others government stakeholders (i.e. business and public agencies).

The next section provides details of data collection and analysis procedures followed to obtain and scrutinize the articles examined in this literature review.

3 LITERATURE REVIEW DESIGN

3.1 Literature Review Search

The identification, organization and synthesis of literature is useful to detect published articles on the discipline, and have different perspectives on its issues and evolution [87]. As such,

review articles ascertain the state of the art in the field [29] and are critical to strengthening a field of study.

An effective review creates a firm foundation for advancing knowledge [88]. It presents a coherent summary of previous research main findings [13], closes areas where an excess of research exists and uncovers areas where research is needed to advance the state of theory, thus assisting theory development [88].

As already stated, we built on articles that have recently conducted literature reviews on e-service quality in the public sector [27,73,83]. In order to complement them and engage in a structured approach to find more relevant literature on e-Government service quality we followed the steps recommend by Webster and Watson [88]: 1) Search for major contributions in leading journals; 2) Review references of the articles identified in step 1 (i.e. go backward); and 3) Identify articles citing the key articles found in steps 1 and 2 (i.e. go forward).

To comply with the first step, we conducted a literature search on the Web of Science platform on April 12, 2016. Using the keyword "public service quality" as topic, we search for articles published in major IS journals from the AIS Senior Scholars' Basket of Journals, namely *European Journal of Information Systems, Information Systems Journal, Information Systems Research, Journal of AIS, Journal of Information Technology, Journal of MIS, Journal of Strategic Information Systems*, and *MIS Quarterly*. This process resulted in the finding of nine articles. We went through the title, abstract, and keywords of these articles and kept only one new article that addresses our research topic [22].

We started working on that article [22] and the three literature reviews previously identified [27,73,83], but we deliberated that these articles were not enough. Hence, we conducted a new search in the same journals on October 6, 2016, with a period limitation on the last five years using as keywords "public sector" or "government" and "public service quality" or "service quality". Three new articles were found [33,44,86].

We retained the seven articles identified and, following the second step of Webster and Watson [88], conducted a traditional literature review as we read them and manually went through their references. Given the previous results of the online search, we aimed to identify more papers concerning e-Government service quality. Hence, we considered any type of publication in conferences proceedings and journals. The process of reading and revising references continued with the new articles found. Finally, we also tried to find related research from the same authors or research teams and articles citing the publications previously found until no newer concepts were found [88]. Altogether, we identified 69 articles (Table 1) published from 2002 to 2016 that explicitly discuss IS impact on public service quality.

Table 1: Number of relevant papers

Source	No
Previous literature reviews	3
Searches in leading journals	4
Articles cited backward and citing forward	62
Total	69

3.2 Review Framework

The 69 articles were carefully read. From these articles, we further focused on 48 that assess e-Government service quality as a final dependent variable composed of different independent variables. This means that we focused on articles that present conceptual models derived from variance theories, which integrate independent variables that cause variation in the dependent variable [88] of this study. Hence a set of competing models on e-Government service quality were reviewed.

Many publications followed research previously initiated by an author or research team. Hence, these articles were grouped because researchers conduct an investigation accumulating the knowledge acquired for a period of time in different publications. As a result of this process, 28 independent investigations were identified.

Content analysis was conducted to understand the 28 investigations. A concept matrix (Table 2) was built in order to synthesize and organize the key concepts identified [88]. We developed a logical approach to grouping and presenting key concepts, based on the tables of Tan et al. [83] and Ortbach [59].

Table 2 lists the 48 articles in alphabetic and time order. Research conducted by the same author or research team are shown in the same row of Table 2, thus reveling the 28 competing models on e-Government service quality identified. For each of these 28 investigations, Table 2 summarizes name of the dependent variable; scope of application and empirical context; and research procedures.

The scope of application was categorized following Fath-Allah et al. [26] who considers the quality domain as e-Government website (WQ) or service (SQ) quality and the quality focus as supply (SS) or demand (DS) side. The context refers to the country where the final empirical analysis was conducted. If it is shown in *italics*, it means that the empirical analyses have not been conducted yet, but was proposed as a future research study.

Research procedures are shown in Table 2 in the order of application expressed by the authors in their investigations. In order to classify them, we followed Hofmann et al. [39] who distinguish: quantitative empirical survey (ES); empirical analysis (EA); literature review (LR); content analysis (CA); and qualitative analysis (QA). In addition, for content analyses (CA) we specified among those applied for examining the content of websites (CAws), commentaries on surveys (CAs) or interviews (CAi), and for data collection in qualitative analyses (QA) among qualitative interviews (QI), focus groups (FG), panel of experts (PE), Delphi method (DM), and case studies (CS).

As many of the articles develop a new model or questionnaire or, at least, categorize dimensions related to service quality, we added the categories model development (MD), questionnaire development (QD) and dimensions categorization (DC). Finally, as one investigation tests the proposed questionnaire in a controlled laboratory setting (LS) we also added this category.

The theoretical frame of the articles, explicitly mentioned definition of the dependent variable, and the independent variables proposed by the authors were also analyzed and are further explained in the sections 4.2, 4.4, and 4.7, respectively.

4 RESULTS AND DISCUSSION

4.1 Summary of Extant Literature

Table 2 shows an integrative view of 48 articles, classified in 28 investigations, which propose a set of competing models to assess e-Government service quality as a final dependent variable composed of different independent variables. This integrative view of these models hardly existed before in the literature. This finding is similar to the conclusion of Hofmann et al. [39], who conducted a literature review on e-Government acceptance.

Table 2: Summary of Extant Literature on E-Government Service Quality

No	Author(s)	Dependent variable	Scope of application [Context]	Research procedures	
1	Agrawal et al. [2,3] Agrawal [1]	E-governance online-service quality	SQ DS [India]	LR MD FG QI	PE QD ES
2	Alanezi et al. [4,5]	E-government service quality	SQ DS [Saudi Arabia]	LR MD QD QI	CAi
3	AlBalushi and Ali [6]	Quality of e-government services	SQ DS [Oman]	LR DC	
4	Barnes and Vidgen [9,11,12]	Users' overall perceptions of the site's web quality	WQ DS [UK]	ES CAs	
5	Bhattacharya et al. [15]	E-service quality in e-government	WQ DS [India]	LR MD QI	QD ES
6	Bouaziz et al. [16]	E-service quality in e-government portals	WQ DS [None]	LR MD QD	
7	Chua et al. [19]	Quality of government websites	WQ DS [40 nations]	LR MD CAws	
8	Connolly et al. [22]	Government website service quality	WQ DS [Ireland]	LR MD QD	ES

9	Elling et al. [24,25]	Quality of governmental websites	WQ DS [Netherland]	LR QD LS	ES
10	Fath-Allah et al. [26,27]	E-government portals best practices	WQ DS [Cross-country]	LR MD CS	
11	Garcia et al. [32]	Quality of e-government sites	WQ SS [Brazil]	LR MD QD	CAws
12	Henriksson et al. [37]	Quality of government websites	WQ SS [Australia]	LR QD QI	CAws
13	Huai [40]	Public service quality of e-government	SQ DS [China]	QD CS ES	
14	Jun et al. [48]	E-government websites service quality	WQ DS [None]	QD	
15	Kaisara and Pather [49]	E-government service quality	SQ DS [South Africa]	LR CS FG QD	ES
16	Krishnan and Teo [51]	E-government service quality	SQ in a nation DS [123 countries]	LR MD EA	
17	Nguyen [56]	E-government service quality	SQ SS from experts' perspective [Japan]	LR MD	
18	Papadomichelaki et al. [61] Halaris et al. [35] Magoutas et al. [53] Papadomichelaki and Mentzas [62,63]	E-government service quality	WQ and SQ DS [Greek]	LR MD QD ES	
19	Quirchmayr et al. [65] Chutimaskul et al. [20] Chutimaskul and Funilkul [21]	E-government services system quality	SQ SS and DS [Thailand]	LR MD ES	
20	Rababah et al. [66]	E-government website quality	WQ SS [Jordan]	LR PE DC	QI ES
21	Sá et al. [69–74]	Quality of local government online services	SQ DS [Portugal]	LR MD QI DM	QD ES
22	Saha et al. [75]	Quality of government tax website	WQ DS [Sweden]	LR MD QD	ES
23	Shareef et al. [78]	E-Government service quality	SQ DS [Canada]	LR MD QD	ES
24	Sharma et al. [79]	Quality of e-Government services	SQ DS [Oman]	LR FG MD	QD ES
25	Tan and Benbasat [81] Tan et al. [83]	E-Government service quality	SQ DS [United States]	LR MD CS QD ES	
26	Ulman et al. [84]	Agricultural e-government service quality	SQ DS [Czech Republic]	LR MD QD	
27	Zaidi and Qteishat [90]	E-Government service quality	SQ DS [India]	LR QI MD	
28	Ziemba et al. [91,92]	Quality of e-government portals	WQ SS and DS [Poland]	LR MD QD	CS ES

4.2 Theoretical lens

This section discusses the theoretical lens of the investigations presented in Table 2. The earlier research identified is number 4 which adapt the *e-Qual* approach, previously developed for e-service quality [8,10], in the context of e-Government. In fact, most of the articles analyzed build on models of e-service quality to propose new ones for public e-services and websites. We found many articles that conduct comprehensive literature reviews on e-service quality models. Among them are e.g. investigations 2, 8, 17, 18, 21, 23, 24 and 25. These e-service quality models are sometimes complemented or extended with other IS theories, such as TAM (1 and 17) or IS Success models (19, 15, 17, and 22).

In addition, many of the investigations shown in Table 2 are grounded on the marketing model called *SERVQUAL* (e.g. 2, 13, 19, 25 and 26). Other investigations build on the adapted model which was divided into two instruments called *E-S-QUAL* and e-*RecS-QUAL* (e.g. 8, 14, 18, 26 and 27). Furthermore, some investigations build on *ISO 9126, 9241, 13407* or *25010* quality standards models (e.g. 10, 19, 20, 26, 27, and 28).

However, we realized that many articles fail to build on e-Government service quality models. In fact, with 11 articles on e-Government service quality cited, Fath-Allah et al. [26] is the paper that considers most of the 48 articles that we identified. Other authors that aim to build on e-Government service quality models did not cite more than 6 (e.g. 5, 22, 26, and 28).

Even more concerning is the fact that many of the articles claim that research in the field is "*very little*" [56 p. 16], "*handful*" [48 p. 515], "*relatively understudied*" [81 p. 175], "*relatively lacking*" [75 p. 300] or "*hardly*" [78 p. 2] studied. This may had been true years ago, but the 48 articles found show that these are not just

"*quite few studies*" [79 p. 88] and that issues of e-Government websites quality have not been "*ignored*" [91 p. 252].

4.3 Context

Neither is true that "*these models are seen more oriented towards advanced nations whereas developing countries are yet to receive scholars' attention*" [79 p. 89]. Although we would have expected that e-Government service quality research would have started in developed countries and then replicate in developing countries (like many other IS research), the results show that this is not the case. For example, early research was being carried out in the UK (4), while another was being conducted in Brazil (11).

Similarly, recent studies were conducted in both developed and developing countries. Among the first are studies conducted in Ireland (8), Netherlands (9), Australia (12), Portugal (21), Sweden (22), Canada (23), and the United States (25). Among the second are investigations in India (1 and 5), Saudi Arabia (2), China (13), South Africa (15), Greek (18), Thailand (19), Jordan (20), Oman (24), Czech Republic (26), and Poland (28).

These results are also similar to the ones found by Hofmann et al. [39] who concluded that most of the articles and surveys on acceptance and adoption of e-Government services deal with data from single countries in a case study manner. However, some investigations we identified are cross-country (7, 16, 10, and 25). Other investigations do not refer to any specific context (6 and 14). While some authors affirm that future studies will be developed in Japan (17), Oman (3) and India (27).

Consequently, Table 2 shows that there are many studies on e-Government service quality and these studies are disseminated around the world. It is our job as researcher to look for these studies because it is not sufficient, nor ethic, to justify an investigation saying that the field of knowledge has not been studied enough. In fact, it is not enough to affirm that there is a gap in the literature, but instead, researchers should reveal why filling that gap is relevant, important, stimulating, controversial, and how it contributes to knowledge [28]. Hence, we must search for previous investigations –either we think they are good or bad– and build on them to improve knowledge and find what is needed to complement or give a new approach on a research topic.

4.4 Name and definition of the dependent variable

We believe that the troubling result showing that researchers fail to recognize the research of others is due to the fact that their dependent variables are differently entitled. Indeed, Table 2 shows that the dependent variables of the 28 models have been called in nineteen different ways. *E-Government service quality* is the most frequent name, as it is used by eight investigations (2, 15, 16, 17, 18, 23, 25, and 27). Both *quality of e-Government services* and *quality of government websites* are used by two investigations (3 and 24, 7 and 12, respectively). The other sixteen names are used only once by each of the sixteen investigations remaining.

It is clear that some researchers want to narrowly delimit the scope of their variables, e.g. *quality of government tax website* (22)

and *quality of local government online services* (21). These limited definitions are perfectly acceptable since they reflect the characteristics of a certain context and application [89]. However, giving so many names for similar concepts may lead to more dispersed research in the field of knowledge making it confusing to study related investigations. Hence, we call for researchers to justify the use of new names for their variables. If authors fail in doing so, they should use a name already known in the literature.

Another fact that we believe is affecting the accumulation of knowledge in the field is that 17 out of the 28 investigations identified did not explicitly define the dependent variable of the study. Both in journals and conference proceedings explicit definitions are missing. For example in the articles published in *European Journal of Information Systems* (8), *Government Information Quarterly* (9, 15, 18, and 21), *Electronic Government, an International Journal* (4 and 12) *and Electronic Government International Conferences* [24,32,53,61,62].

This may be justified in the case of early investigations in the area (e.g. 4 and 11) because e-service quality research was still in its infancy [77] and the limited amount of assessment of e-Government service quality remained a major weakness [42]. However, after more than 10 years since these studies have been developed, we believe that the lack of explicit definitions should be overcome. Researchers must explicitly define the variables that are part of their models. If not, the reader may not completely understand what the model is trying to evaluate. In fact, previous research encourages authors to go more in depth in their conceptualizations [13] because higher levels of conceptual clarity are necessary to define e-Government projects [89].

However, it is not mandatory to propose a new definition because we can always use or build on previous ones. This is the case of many of the definitions used by the authors shown in Table 2. Fortunately, we observed that the definitions are consistent with the research scope of application. For example, investigations with a quality domain on service quality and a quality focus on the demand side (16, 23, and 25) use citizen-centric definitions of e-Government services. Some are based on the definition presented by Tan, Benbasat and Cenfetelli [82 p. 1].

4.5 Scope of application

Table 2 shows that the quality focus is mostly oriented on the demand side, with 22 models focusing only on citizens' perspective. This result is consistent with Hofmann et al. [39] who found that citizens' perceptions are often studied when assessing e-Government acceptance. This result is also expected as service quality is a measure of how well a delivered service matches expectations of customers [56].

Nevertheless, we believe that studying the supply side is likewise important when assessing e-Government service quality because service quality is generated from within an organization and is offered to the outside. This means that actual service performance depends on the back office of an organization. Later, customers' perception of service quality will stem from a comparison of what customers feel an organization should offer

(i.e. expectations) with the organization's actual service performance [64].

In many public services, employees influence the service quality perceived by other government stakeholders. Following this line of thought, 4 models study only the supply side of public services. While investigation 17 focuses on the influence of the CIOs on service quality from experts' perspective, 11, 12 and 20 focus on website quality from specialists' and developers' perspective.

Only 2 investigations study both the supply and demand side (28 and 19). Few studies have the scope of application focus on a restricted type of public service; i.e. 13, 15 and 21 study local public service quality from the demand side, while 22 analyzes tax website quality also from the demand side.

Considering only the quality domain, the number of investigations is equal for website quality and service quality with 13 models each. Other 2 models appear to be significantly different from the rest; number 16 compares e-Government service quality in different countries (not in different services), and 18 is the only one that assesses both website and service quality.

The studies that emphasize on website quality have a particular focus on the quality of the portal or virtual content of the service provided online, but not on the enhancement provided by IS on the quality of the public service delivered (i.e. service quality). The first domain refers to the quality of the medium (e.g. website or portal) used to deliver a service, while the second refers to the quality of the public service itself (e.g. transport, tax filling, justice). Hence, investigations that only evaluate website quality do not constitute a comprehensive evaluation of the quality of the public service delivered (i.e. service quality), but only of the medium through which the service is delivered.

4.6   Research procedures

The most common form of research procedures is literature review (25 models), followed by model development (20), questionnaire development (19), and quantitative empirical survey (16). Only two articles end the analyses with a dimensions categorization. We believe that this frequency of the research procedures may be conditioned because we especially focused on publications that assess e-Government service quality as a final dependent variable composed of different independent variables. Hence, the results seem coherent because when developing a model, researchers must review previous studies on the subject to define variables. With these definitions, a questionnaire may be developed and later apply to the target population.

During this process, qualitative techniques can also we applied to validate variables. In the models we analyzed, qualitative data collection is mostly gathered through qualitative interviews and case studies. Other studies use focus groups and panel of experts, while only one uses Delphi method (21). Content analysis of websites is used for website quality evaluation (7, 11, and 12). Other research techniques are only applied once: commentaries on surveys (4) or interviews (2); empirical analysis (16), and laboratory setting (9).

4.7   Independent variables

The dependent variable e-Government service quality has been operationalized with many independent variables. In fact, 95 different independent variables (Table 3) turned out to be relevant to evaluate e-Government service quality in the last article published by the author or research team of the 28 competing models. Although many authors or research teams do not consider the same variables in each of their publications, we only focused on the findings of the last article of each author or research team because their investigations are conducted accumulating knowledge.

Table 3: Independent Variables

No	Independent variable	No	Independent variable
1	Accessibility	49	Management
2	Accountability	50	Navigability
3	Aesthetics/minimalist design	51	Navigation
4	Appealing website	52	Organization quality
5	Assurance	53	Overall service quality
6	Availability	54	Performance
7	Back-end	55	Performance efficiency
8	Citizen centricity	56	Personalization
9	Citizen involvement	57	Portability
10	Citizen participation	58	Privacy
11	Citizen support	59	Procedural
12	Communication	60	Process Quality
13	Compatibility	61	Readability
14	Compensation	62	Recognition instead of remembrance
15	Complete information	63	Reliability
16	Consistency and patterns	64	Resourceful
17	Contact	65	Responsiveness
18	Content	66	Satisfaction
19	Content/website design	67	Security
20	Context coverage	68	Security and privacy
21	Convenience	69	Service agility
22	Customer care	70	Service content
23	Ease of Completion	71	Service delivery
24	Ease of interaction	72	Service interaction
25	Effectiveness	73	Service quality
26	Efficiency	74	Services
27	Empathy	75	Services
28	E-participation	76	Site aesthetics
29	Error prevention and diagnosis	77	Site compatibility with real life
30	Error preventions	78	Site design
31	External	79	Status system
32	Features	80	System Availability
33	Freedom from risk	81	System function
34	Front-end web design	82	System quality
35	Fulfillment	83	Tangibles
36	Functional quality	84	Technical
37	Functional suitability	85	Technical adequacy
38	Functionality	86	Transaction transparency

39	Help and documentation	87	Transparency
40	Information	88	Trust
41	IT infrastructure	89	Trustworthiness
42	Information quality	90	Usability
43	Information reliability	91	Usage flexibility and efficiency
44	Institutional regulations	92	User control and freedom
45	Interoperability	93	Utility
46	Lack of citizen orientation	94	Website content
47	Layout	95	Website design
48	Maintainability		

Among the 95 independent variables (Table 3), 72 are only used in a single investigation of the 28 analyzed (Table 2), 12 variables are used in 2 investigations, 2 variables in 3 investigations, 4 variables in 4 investigations, 1 variable in 5 investigations, 3 variables in 6 investigations and 1 variable in 7 investigations. The variables that were empirically validated the most are Information Quality, Reliability (6 investigations), followed by Usability (5 investigations), Content, Efficiency, Security, Security and Privacy, System Quality (4 investigations).

The validity of the variables shown in Table 3 depends on the context of study because e-public service must be aware of the context in which e-service is delivered [18] to take its idiosyncrasies into account [48]. Indeed, quality dimensions depend on the attributes of the delivered service [63]. Hence, IS implementation for the provision of public services should acknowledge the context where such services are delivered because context-aware and context-smart services are examples of digital innovations in the public sector [14].

In addition, authors recommend studies with varying contexts in order to enhance the validity of single variables because further tests and extensions of existing models increase the information about their validity [39]. Hence, in the selection of variables to assess e-Government service quality, researchers should further use the variables that were previously empirically validated in more than one investigation. However, an instrument can be adapted for any service context [1] and, taking this context into consideration, additional variables may be incorporated [75].

5 CONCLUSIONS AND FUTURE WORK

In this paper, a literature review has been conducted. The findings consolidate research around 48 articles that proposed 28 competing models on e-Government service quality. We explicitly identify dependent and independent variables, theoretical lens, scopes of application, contexts, and research procedures. This responds to the need of conducting literature reviews which conceptualize research areas and synthesize prior research [88].

Table 2 is logically structured around central ideas and adds value to the literature by categorizing articles based on a conceptual structure that helps to define e-Government service quality research. This implies that the 28 models could be more easily compared, thus fostering progress toward e-Government service quality field and serving as a basis for future research [88].

We found that this research area has common drawbacks that must be rectified in future research to move the field forward [88]: 1) Many articles failed to build on e-Government service quality models; 2) There are many different ways to call the dependent variable (19 names); 3) Many models do not explicitly define the dependent variable (17 models); 4) Employees' perceptions are not comprehensive studied, while citizens' perceptions are mostly considered (4 models focus on the supply side vs. 22 that focus on the demand side); 5) There are many independent variables (95 variables) proposed to evaluate e-Government service quality.

To close the gaps identified in the literature we recommend that future research should: 1) Systematically investigate the related research in the domain before affirming that e-Government service quality has been "hardly" or "very little" studied; 2) Justify the use of new names for variables; 3) Explicitly define the variables analyzed; 4) Study the supply side; 5) Use variables that were previously empirically validated in more than one context of study.

In the field of IS, this article complements research in e-service quality by studying it in the context of government. For marketing literature, this paper augments in the evaluation of service quality due to IS implementation in government. Regarding public administration, this investigation complements existing studies of e-Government by addressing its value for public agencies and citizens [13] in terms of service quality.

This article responds to the call of evaluating the overlooked area of government operational capacity to enhance public value with IS and identifying indicators for public value creation [23] and developing more theory-based research in e-Government as a field of study and by topic areas [80]. In this sense, this paper shows a coherent summary of previous research main findings [13] about independent variables that cause variation in the dependent variable e-Government service quality.

The variables identified could help public managers in recognizing what is important in producing and providing high-quality public services and in distinguishing between effective or ineffective IS in terms of their impact on service quality.

This study has limitations that are inherent to literature reviews. Keywords may seem reasonable to infer the document topics but they actually are an imperfect proxy of the document content. This limitation was overcome by reading the articles. In the online search, we did not include journals related to Public Administration and, particularly, e-Government. With the search for references and citations we identified different e-Government specific journals and conference proceedings so this limitation was partly overcome. There are many other outlets that could have been analyzed so we do not claim our article selection to be entirely complete. Even though it is normal to miss some articles [88], we believe the analysis of the 48 articles identified gave a good overview of global research in this topic.

Nevertheless, future research may include a wider variety of sources with searches on journals and conference proceedings that are e-Government specific (e.g. *Government Information Quarterly, International Conference on Theory and Practice of Electronic Governance*). In addition, future research involves an

endeavor to develop a new model of e-Government service quality, which specify its scope of application and clearly label independent and mediating (or moderating) variables. To empirically test such model, the selection of items to measure perceptions may be used. In this selection, researchers should further focus on the variables that were previously empirically validated in more than one study and consider the service context.

REFERENCES

[1] Anand Agrawal. 2009. Assessing E-Governance Online-Service Quality (EGOSQ). In *E-Government Development and Diffusion*. IGI Global, 133–148. DOI:https://doi.org/10.4018/978-1-60566-713-3.ch009

[2] Anand Agrawal, Pragya Shah, and Varun Wadhwa. 2007. EGOSQ - Users ' Assessment of e-Governance Online-Services: A Quality Measurement Instrumentation. In *Foundations of E-government*, Anand Agrawal and Ramana V. Venkata (eds.). GIFT publications, 231–244.

[3] Anand Agrawal, Pragya Shah, and Varun Wadhwa. 2009. EGOSQ—User's assessment of e-Governance online-services. *Comput. Soc. India* (2009), 231–244.

[4] Mohammed Ateeq Alanezi, Ahmad Kamil Mahmood, and Shuib Basri. 2010. A proposed instrument dimensions for measuring e-government service quality. *Int. J. u-and e-Service* 3, 4 (2010), 1–18.

[5] Mohammed Ateeq Alanezi, Ahmad Kamil Mahmood, and Shuib Basri. 2012. E-Government Service Quality: a Qualitative Evaluation in the Case of Saudi Arabia. *Electron. J. Inf. Syst. Dev. Ctries.* 54, 3 (2012), 1–20.

[6] Taisira Hazeem AlBalushi and Saqib Ali. 2015. Evaluation of the quality of E-government services: Quality trend analysis. In *2015 International Conference on Information and Communication Technology Research (ICTRC)*, 226–229. DOI:https://doi.org/10.1109/ICTRC.2015.7156463

[7] Alessandro Ancarani. 2005. Towards quality e-service in the public sector: *Manag. Serv. Qual. An Int. J.* 15, 1 (February 2005), 6–23. DOI:https://doi.org/10.1108/09604520510575236

[8] Stuart J. Barnes and Richard T. Vidgen. 2001. An evaluation of cyber-bookshops: the WebQual method. *Int. J. Electron. Commer.* 6, 1 (2001), 11–30. DOI:https://doi.org/10.1080/10864415.2001.11044225

[9] Stuart J. Barnes and Richard T. Vidgen. 2003. Interactive e-government: evaluating the web site of the UK Inland Revenue. *J. Electron. Commer. Organ.* 2, 1 (2003), 42–63.

[10] Stuart J. Barnes and Richard T. Vidgen. 2003. An integrative approach to the assessment of E-commerce quality. *J. Electron. Commer. Res.* 3, 3 (May 2003), 114–127.

[11] Stuart J. Barnes and Richard T. Vidgen. 2004. Interactive e-government services: modelling user perceptions with eQual. *Electron. Gov. an Int. J.* 1, 2 (2004), 213. DOI:https://doi.org/10.1504/EG.2004.005179

[12] Stuart J. Barnes and Richard T. Vidgen. 2006. Data triangulation and web quality metrics: A case study in e-government. *Inf. Manag.* 43, 6 (September 2006), 767–777. DOI:https://doi.org/10.1016/j.im.2006.06.001

[13] France Belanger and Lemuria Carter. 2012. Digitizing Government Interactions with Constituents: An Historical Review of E-Government Research in Information Systems. *J. Assoc. Inf. Syst.* 13, 5 (May 2012), 363–394.

[14] John Bertot, Elsa Estevez, and Tomasz Janowski. 2016. Universal and contextualized public services: Digital public service innovation framework. *Gov. Inf. Q.* 33, 2 (April 2016), 211–222. DOI:https://doi.org/10.1016/j.giq.2016.05.004

[15] Debjani Bhattacharya, Umesh Gulla, and M.P. Gupta. 2012. E-service quality model for Indian government portals: Citizens' perspective. *J. Enterp. Inf. Manag.* 25, 3 (2012), 246–271. DOI:https://doi.org/10.1108/17410391211224408

[16] Fatma Bouaziz, Rekik Fakhfakh, and Achraf Ayadi. 2007. Service Quality in E-Government Portals. In *Encyclopedia of Portal Technologies and Applications*. IGI Global, 912–917. DOI:https://doi.org/10.4018/978-1-59140-989-2.ch150

[17] Tobias Brandt, Jamie Cudden, Wolfgang Ketter, David Prendergast, Mihoko Sakurai, and Richard T Watson. 2016. Smart Cities and the Role of IS Research in Improving Urban Life Panel. In *ICIS 2016 Proceedings*, 1–8.

[18] Joan Buckley. 2003. E-service quality and the public sector. *Manag. Serv. Qual. An Int. J.* 13, 6 (December 2003), 453–462. DOI:https://doi.org/10.1108/09604520310506513

[19] Alton Y.K. Chua, Dion H Goh, and Rebecca P Ang. 2012. Web 2.0 applications in government web sites Prevalence, use and correlations with perceived web site quality. *Online Inf. Rev.* 36, 2 (April 2012), 175–195. DOI:https://doi.org/10.1108/14684521211229020

[20] Wichian Chutimaskul, Suree Funilkul, and V Chongsuphajaisiddhi. 2008. The quality framework of e-government development. In *Proceedings of the 2nd international conference on Theory and practice of electronic governance*, 105–109. DOI:https://doi.org/10.1145/1509096.1509117

[21] Wichian Chutimaskul and Suree Funilkul. 2012. The Framework for Monitoring the Development Process and Inspection of Government Information System and Technology: A Case Study in Thailand. In *Advancing Democracy, Government and Governance*. 29–43. DOI:https://doi.org/10.1007/978-3-642-32701-8_4

[22] Regina Connolly, Frank Bannister, and Aideen Kearney. 2010. Government website service quality: a study of the Irish revenue online service. *Eur. J. Inf. Syst.* 19, 6 (December 2010), 649–667. DOI:https://doi.org/10.1057/ejis.2010.45

[23] Antonio Cordella and Leslie Willcocks. 2012. Government policy, public value and IT outsourcing: The strategic case of ASPIRE. *J. Strateg. Inf. Syst.* 21, 4 (December 2012), 295–307. DOI:https://doi.org/10.1016/j.jsis.2012.10.007

[24] Sanne Elling, Leo Lentz, and Menno de Jong. 2007. Website Evaluation Questionnaire: Development of a Research-Based Tool for Evaluating Informational Websites. In *Electronic Government. 6th International Conference, EGOV 2007*. 293–304. DOI:https://doi.org/10.1007/978-3-540-74444-3_25

[25] Sanne Elling, Leo Lentz, Menno de Jong, and Huub van den Bergh. 2012. Measuring the quality of governmental websites in a controlled versus an online setting with the "Website Evaluation Questionnaire." *Gov. Inf. Q.* 29, 3 (July 2012), 383–393. DOI:https://doi.org/10.1016/j.giq.2011.11.004

[26] Abdoullah Fath-Allah, Laila Cheikhi, Rafa E. Al Qutaish, and Ali Idri. 2014. A Comparative Analysis of E-Government Quality Models. *Int. J. Soc. Manag. Econ. Bus. Eng.* 8, 11 (2014), 3345–3349.

[27] Abdoullah Fath-Allah, Laila Cheikhi, Rafa E. Al Qutaish, and Ali Idri. 2014. E-government portals best practices: a comprehensive survey. *Electron. Gov. an Int. J.* 11, 1/2 (2014), 101. DOI:https://doi.org/10.1504/EG.2014.063316

[28] Manuel Portugal Ferreira. 2013. A Pesquisa e a Estruturação do Artigo Acadêmico em Administração. *Rev. Ibero-Americana Estratégia* 12, 2 (June 2013), 01–11. DOI:https://doi.org/10.5585/riae.v12i2.2034

[29] Manuel Portugal Ferreira, Cláudia Frias Pinto, and Fernando Antonio Ribeiro Serra. 2014. The transaction costs theory in international business research: a bibliometric study over three decades. *Scientometrics* 98, 3 (March 2014), 1899–1922. DOI:https://doi.org/10.1007/s11192-013-1172-8

[30] Michael Fitzgerald. 2016. Data-Driven City Management. *MIT Sloan Manag. Rev.* May (2016), 3–15.

[31] Jane E. Fountain. 2001. Building the Virtual State: Information Technology and Institutional Change. Brookings Institution Press.

[32] Ana Cristina Bicharra Garcia, Cristiano Maciel, and Fernando Bicharra Pinto. 2005. A Quality Inspection Method to Evaluate E-Government Sites. In *Electronic Government. 4th International Conference, EGOV 2005, Copenhagen, Denmark, August 22-26, 2005. Proceedings*. 198–209. DOI:https://doi.org/10.1007/11545156_19

[33] Robin Gauld, Jayde Flett, Sasha McComb, and Andrew Gray. 2016. How responsive are government agencies when contacted by email? Findings from a longitudinal study in Australia and New Zealand. *Gov. Inf. Q.* 33, 2 (2016), 283–290. DOI:https://doi.org/10.1016/j.giq.2016.03.004

[34] Michael Grimsley and Anthony Meehan. 2007. e-Government information systems: Evaluation-led design for public value and client trust. *Eur. J. Inf. Syst.* 16, 2 (2007), 134–148. DOI:https://doi.org/10.1057/palgrave.ejis.3000674

[35] Christos Halaris, Babis Magoutas, Xenia Papadomichelaki, and Gregoris Mentzas. 2007. Classification and synthesis of quality approaches in e-government services. *Internet Res.* 17, 4 (August 2007), 378–401. DOI:https://doi.org/10.1108/10662240710828058

[36] Richard Heeks and Savita Bailur. 2007. Analyzing e-government research: Perspectives, philosophies, theories, methods, and practice. *Gov. Inf. Q.* 24, 2 (April 2007), 243–265. DOI:https://doi.org/10.1016/j.giq.2006.06.005

[37] Anders Henriksson, Yiori Yi, Belinda Frost, and Michael Middleton. 2007. Evaluation instrument for e-government websites. *Electron. Gov. an Int. J.* 4, 2 (2007), 204–226. DOI:https://doi.org/10.1504/EG.2007.013984

[38] Alfred Tat-Kei Ho. 2002. Reinventing Local Governments and the E-Government Initiative. *Public Adm. Rev.* 62, 4 (January 2002), 434–444. DOI:https://doi.org/10.1111/0033-3352.00197

[39] Sara Hofmann, Michael Räckers, and Jörg Becker. 2012. Identifying Factors of E-Government Acceptance – A Literature Review. In *Proceedings of the Thirty-Third International Conference on Information Systems*, 1–10.

[40] Jinmei Huai. 2011. Quality Evaluation of E-Government Public Service. In *2011 International Conference on Management and Service Science*, 1–4. DOI:https://doi.org/10.1109/ICMSS.2011.5999011

[41] Paul T Jaeger. 2003. The endless wire: e-government as global phenomenon. *Gov. Inf. Q.* 20, 4 (January 2003), 323–331. DOI:https://doi.org/10.1016/j.giq.2003.08.003

[42] Paul T Jaeger and Kim M Thompson. 2003. E-government around the world: lessons, challenges, and future directions. *Gov. Inf. Q.* 20, 4 (January 2003), 389–394. DOI:https://doi.org/10.1016/j.giq.2003.08.001

[43] Tomasz Janowski. 2015. Digital government evolution: From transformation to contextualization. *Gov. Inf. Q.* 32, 3 (July 2015), 221–236. DOI:https://doi.org/10.1016/j.giq.2015.07.001

[44] Thorhildur Jetzek. 2016. Managing complexity across multiple dimensions of liquid open data: The case of the Danish Basic Data Program. *Gov. Inf. Q.* 33, 1 (2016), 89–104. DOI:https://doi.org/10.1016/j.giq.2015.11.003

[45] Thorhildur Jetzek, Michel Avital, and Niels Bjørn-Andersen. 2013. Generating Value from Open Government Data. In *ICIS 2013 Reshaping Society Through Information Systems Design*, 1737–1756.

[46] Tornhildur Jetzek, Michel Avital, and Niles Bjørn-Andersen. 2012. The Value of Open Government Data. In *SIG eGovernment pre-ICIS Workshop*, 12. DOI:https://doi.org/10.13140/RG.2.1.2413.3608

[47] Rhoda C. Joseph. 2013. A structured analysis of e-government studies: Trends and opportunities. *Gov. Inf. Q.* 30, 4 (October 2013), 435–440. DOI:https://doi.org/10.1016/j.giq.2013.05.006

[48] Zhuo Jun, Chen Liangliang, and Li Fubin. 2009. E-S-QUAL: Its Applicability in Evaluating E- government Web Sites Service Quality. In *International Symposium on Information Engineering and Electronic Commerce, 2009. IEEC '09.*, 515–518. DOI:https://doi.org/10.1109/IEEC.2009.114

[49] Godwin Kaisara and Shaun Pather. 2011. The e-Government evaluation challenge: A South African Batho Pele-aligned service quality approach. *Gov. Inf. Q.* 28, 2 (April 2011), 211–221. DOI:https://doi.org/10.1016/j.giq.2010.07.008

[50] Ian Kearns. 2004. *Public value and e-government.* Institute for Public Policy Research, London.

[51] Satish Krishnan and Thompson Teo. 2011. Engaging Citizens in Managing Electronic Government Service Quality: A Country Level Analysis. In *ICIS 2011 Proceedings.* 6., 1–12.

[52] Karen Layne and Jungwoo Lee. 2001. Developing fully functional E-government: A four stage model. *Gov. Inf. Q.* 18, 2 (June 2001), 122–136. DOI:https://doi.org/10.1016/S0740-624X(01)00066-1

[53] Babis Magoutas, Christos Halaris, and Gregoris Mentzas. 2007. An Ontology for the Multi-perspective Evaluation of Quality in E-Government Services. In *Electronic Government. 6th International Conference, EGOV 2007*, Maria A. Wimmer, Jochen Scholl and Åke Grönlund (eds.). Springer Berlin Heidelberg, Berlin, Heidelberg, 318–329. DOI:https://doi.org/10.1007/978-3-540-74444-3

[54] Mark Harrison Moore. 1995. *Creating Public Value: Strategic Management in Government.* Harvard University Press.

[55] Maria Morfoulaki, Glikeria Myrovali, and Kornilia Kotoula. 2015. Increasing the attractiveness of public transport by investing in soft ICT based measures: Going from words to actions under an austerity backdrop – Thessaloniki's case, Greece. *Res. Transp. Econ.* 51, (September 2015), 40–48. DOI:https://doi.org/10.1016/j.retrec.2015.07.006

[56] Manh Hien Nguyen. 2014. A Study on Evaluation of E-Government Service Quality. *Int. J. Soc. Behav. Educ. Econ. Bus. Ind. Eng.* 8, 1 (2014), 16–19.

[57] Donald F. Norris and M. Jae Moon. 2005. Advancing E-government at the Grassroots: Tortoise or Hare? *Public Adm. Rev.* 65, 1 (2005), 64–75.

[58] A Ojo, Edward Curry, and T Janowski. 2014. Designing Next Generation Smart City Initiatives-Harnessing Findings And Lessons From A Study Of Ten Smart City Programs. In *Proceedings of the European Conference on Information Systems (ECIS) 2014*, 0–14.

[59] Kevin Ortbach. 2015. Unraveling The Effect Of Personal Innovativeness On Bring-Your-Own-Device (BYOD) Intention – The Role Of Perceptions Towards Enterprise-Provided And Privately Owned Technologyies. In *ECIS 2015 Completed Research Papers*, 1–17.

[60] Min-Seok Pang, Gwanhoo Lee, and William H DeLone. 2014. In public sector organisations: a public-value management perspective. *J. Inf. Technol.* 29, 3 (2014), 187–205. DOI:https://doi.org/http://dx.doi.org/10.1057/jit.2014.2

[61] Xenia Papadomichelaki, Babis Magoutas, Christos Halaris, Dimitris Apostolou, and Gregoris Mentzas. 2006. A Review of Quality Dimensions in e-Government Services. In *Electronic Government. 5th International Conference, EGOV 2006, Kraków, Poland, September 4-8, 2006. Proceedings*, Maria A. Wimmer, Hans J. Scholl and Enrico Ferro (eds.). Springer Berlin Heidelberg, Berlin, Heidelberg, 128–138. DOI:https://doi.org/10.1007/11823100_12

[62] Xenia Papadomichelaki and Gregoris Mentzas. 2009. A Multiple-Item Scale for Assessing E-Government Service Quality. In *Electronic Government. 8th International Conference, EGOV 2009, Linz, Austria, August 31 - September 3, 2009. Proceedings*. 163–175. DOI:https://doi.org/10.1007/978-3-642-03516-6_14

[63] Xenia Papadomichelaki and Gregoris Mentzas. 2012. e-GovQual: A multiple-item scale for assessing e-government service quality. *Gov. Inf. Q.* 29, 1 (January 2012), 98–109. DOI:https://doi.org/10.1016/j.giq.2011.08.011

[64] A. Parasuraman. 2005. E-S-QUAL: A Multiple-Item Scale for Assessing Electronic Service Quality. *J. Serv. Res.* 7, 3 (February 2005), 213–233. DOI:https://doi.org/10.1177/1094670504271156

[65] Gerald Quirchmayr, S Funilkul, and W Chutimaskul. 2007. A Quality Model of e-Government Services Based on the ISO/IEC 9126 Standard. In *Proceedings of International Legal Informatics Symposium (IRIS)*, 45–53.

[66] Osama Rababah, Thair Hamtini, Osama Harfoushi, Bashar Al-Shboul, Ruba Obiedat, and Sahem Nawafleh. 2013. Towards Developing Successful E-Government Websites. *J. Softw. Eng. Appl.* 6, 11 (2013), 559–563. DOI:https://doi.org/10.4236/jsea.2013.611067

[67] Manuel Pedro Rodríguez Bolívar, Laura Alcaide Muñoz, and Antonio M. López Hernández. 2010. Trends of e-Government research. Contextualization and research opportunities. *Int. J. Digit. Account. Res.* 10, (2010), 87–111. DOI:https://doi.org/10.4192/1577-8517-v10_4

[68] Manuel Pedro Rodríguez Bolívar, Laura Alcaide Muñoz, and Antonio M. López Hernández. 2012. Studying E-Government: Research Methodologies, Data Compilation Techniques and Future Outlook. *Rev. Latinoam. Adm.* 51 (2012), 79–95.

[69] Filipe Sá, Joaquim Gonçalves, Álvaro Rocha, and Manuel Pérez Cota. 2016. Towards an Evaluation Model for the Quality of Local Government Online Services: Preliminary Results. In *Advances in Intelligent Systems and Computing*, Álvaro Rocha, Ana Maria Correia, Hojjat Adeli, Luis Paulo Reis and Marcelo Mendonça Teixeira (eds.). Springer International Publishing, 567–578. DOI:https://doi.org/10.1007/978-3-319-31232-3_53

[70] Filipe Sá, Álvaro Rocha, Joaquim Gonçalves, and Manuel Pérez Cota. 2016. Model for the quality of local government online services. *Telemat. Informatics* (September 2016). DOI:https://doi.org/10.1016/j.tele.2016.09.002

[71] Filipe Sá, Álvaro Rocha, and Manuel Pérez Cota. 2015. A Literature Review on Quality Models for Online E-Government Services. In *Global Perspectives on Risk Management and Accounting in the Public Sector*. IGI Global, 154–169. DOI:https://doi.org/10.4018/978-1-4666-9803-1.ch008

[72] Filipe Sá, Álvaro Rocha, and Manuel Pérez Cota. 2015. Preliminary dimensions for a quality model of electronic local government services. In *2015 10th Iberian Conference on Information Systems and Technologies (CISTI)*, 1–10. DOI:https://doi.org/10.1109/CISTI.2015.7170506

[73] Filipe Sá, Álvaro Rocha, and Manuel Pérez Cota. 2016. From the quality of traditional services to the quality of local e-Government online services: A literature review. *Gov. Inf. Q.* 33, 1 (January 2016), 149–160. DOI:https://doi.org/10.1016/j.giq.2015.07.004

[74] Filipe Sá, Álvaro Rocha, and Manuel Pérez Cota. 2016. Potential dimensions for a local e-Government services quality model. *Telemat. Informatics* 33, 2 (May 2016), 270–276. DOI:https://doi.org/10.1016/j.tele.2015.08.005

[75] Parmita Saha, Atanu K. Nath, and Esmail Salehi-Sangari. 2012. Evaluation of government e-tax websites: an information quality and system quality approach. *Transform. Gov. People, Process Policy* 6, 3 (July 2012), 300–321. DOI:https://doi.org/10.1108/17506161211251281

[76] Rodrigo Sandoval-Almazán and J. Ramon Gil-Garcia. 2015. Understanding judicial websites: An exploration of portals in the states of Mexico. *Proc. Annu. Hawaii Int. Conf. Syst. Sci.* 2015–March, (2015), 2106–2114. DOI:https://doi.org/10.1109/HICSS.2015.253

[77] Jessica Santos. 2003. E-service quality: a model of virtual service quality dimensions. *Manag. Serv. Qual. An Int. J.* 13, 3 (June 2003), 233–246. DOI:https://doi.org/10.1108/09604520310476490

[78] Mahmud Akhter Shareef, Norm Archer, and Yogesh K Dwivedi. 2013. An empirical investigation of electronic government service quality: from the demand-side stakeholder perspective. *Total Qual. Manag. Bus. Excell.* 26, 3–4 (April 2013), 339–354. DOI:https://doi.org/10.1080/14783363.2013.832477

[79] Sujeet Kumar Sharma, Hafedh Al-Shihi, and Srikrishna Madhumohan Govindaluri. 2013. Exploring quality of e-Government services in Oman. *Educ. Bus. Soc. Contemp. Middle East. Issues* 6, 2 (July 2013), 87–100. DOI:https://doi.org/10.1108/EBS-12-2012-0055

[80] John T. Snead and Elisabeth Wright. 2014. E-government research in the United States. *Gov. Inf. Q.* 31, 1 (January 2014), 129–136. DOI:https://doi.org/10.1016/j.giq.2013.07.005

[81] Chee-Wee Tan and Izak Benbasat. 2009. IT Mediated Customer Services in E-Government: A Citizen's Perspective IT. *Commun. Assoc. Inf. Syst.* 24, 12 (2009), 175–198.

[82] Chee-Wee Tan, Izak Benbasat, and Ronald T Cenfetelli. 2008. Building Citizen Trust towards e-Government Services: Do High Quality Websites Matter? In *Proceedings of the 41st Annual Hawaii International Conference on System Sciences*, 1–10. DOI:https://doi.org/10.1109/HICSS.2008.80

[83] Chee-Wee Tan, Izak Benbasat, and Ronald T. Cenfetelli. 2013. IT-Mediated Customer Service Content and Delivery in Electronic Governments: An Empirical Investigation of the Antecedents of Service Quality. *MIS Q.* 37, 1 (2013), 77–109.

[84] M Ulman, V Vostrovský, and J Tyrychtr. 2013. Agricultural eGovernment: Design of Quality Evaluation Method Based on ISO SQuaRE quality Model. *Agris On-Line Pap. Econ. Informatics* 5, 4 (2013), 211–222.

[85] UN. 2016. E-Government Survey 2016: E-Government in support of Sustainable Development. DOI:https://doi.org/10.1016/S1369-7021(02)00629-6

[86] Viswanath Venkatesh, James Y L Thong, Frank K Y Chan, and Paul J H Hu. 2016. Managing citizens' uncertainty in e-government services: The mediating and moderating roles of transparency and trust. *Inf. Syst. Res.* 27, 1 (2016), 87–111. DOI:https://doi.org/10.1287/isre.2015.0612

[87] Rick Vogel. 2013. What Happened to the Public Organization? A Bibliometric Analysis of Public Administration and Organization Studies. *Am. Rev. Public*

Adm. (January 2013), 275074012470867. DOI:https://doi.org/10.1177/0275074012470867

[88] Jane Webster and Richard T Watson. 2002. Analyzing the Past to Prepare for the Future: Writing a Literature Review. *MIS Q.* 26, 2 (2002), xiii–xxiii. DOI:https://doi.org/10.1.1.104.6570

[89] Mete Yildiz. 2007. E-government research: Reviewing the literature, limitations, and ways forward. *Gov. Inf. Q.* 24, 3 (July 2007), 646–665. DOI:https://doi.org/10.1016/j.giq.2007.01.002

[90] Syed Faizan Hussain Zaidi and Mazen K Qteishat. 2012. Assessing e-government service delivery (government to citizen). *Int. J. Ebus. eGovernment Stud.* 4, 1 (2012), 45–54.

[91] Ewa Ziemba, Tomasz Papaj, and Danuta Descours. 2014. Factors Affecting Success of e-Government Portals: A Perspective of Software Quality Model. In *Proceedings of European Conference on eGovernment.* 252–262.

[92] Ewa Ziemba, Tomasz Papaj, and Danuta Descours. 2014. Assessing the quality of e-government portals – the Polish experience. In *2014 Federated Conference on Computer Science and Information Systems, FedCSIS 2014*, 1259–1267. DOI:https://doi.org/10.15439/2014F121