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Potential dimensions for a Local e-Government services quality model

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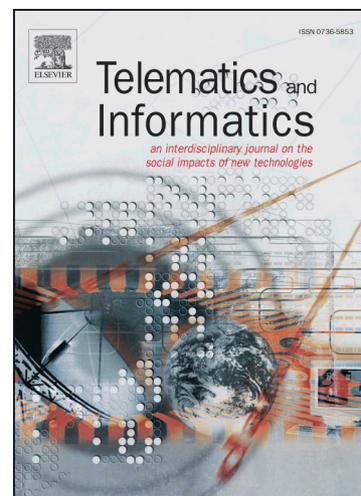# Potential dimensions for a Local e-Government services quality model

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Abstract **— One of the main challenges underlying different Electronic Government forms is the provision of a quality public service. In the Local Government context, local authorities allow for an adjustment between the characteristics of public services and the specificities of local communities, letting populations define their own priorities, which vary from community to community based on objective elements but also subjective by nature. The quality of these services in their electronic format should be analysed and taken into account to potentiate and elaborate a strategy capable of improving offered services, increasing the satisfaction of the recipients. In the present paper we set forth a preliminary list, comprised by thirty dimensions for an Electronic Local Government Quality Model based on a literature review, where we analysed seventeen approaches for electronic and e-Government service quality, as well as an empirical study involving a group of experts and users of Local Government services.**

Keywords—E-Government, E-Services, Services Quality, Public Administration, Local Government

I. INTRODUCTION

Faced with the growing technological evolution and daily access to public services by populations, governments all over the world are constantly challenged to transform and reinvent themselves, in order to provide efficient, effective and economic services. According to Kunstelj and Dečman [1] these services represent a connection between citizens, companies and other public service organs. Citizens, users who evaluate the provision of these services, are increasingly well-informed, on the one hand, and demanding, on the other hand. Lee and Kim [2] contend that the ability to measure the quality of a service is a prerequisite to obtain a high quality level. In their study, Khawaja and Bokhar [3], reveal that organizations struggle to evaluate the quality of the services they provide to clients, that is, they find it difficult to evaluate if, in the context of a service, there are any faults or if the delivery takes place within the stipulated time.

In the context of Electronic Government services, this concern is more and more observable. It is important to note that Maurel [4] identified as the main goals of local public services modernization an improved responsiveness to the daily needs of populations and the promotion and support to local economic development projects. Local Public Services are thus facing the challenge of administrative modernization, trying to bring the residents closer to their services and,

simultaneously, dematerializing their processes [5, 6]. In a press release by the University of Waseda [7] "E-local Government and Smart Cities" are highlighted amongst the next trends of e-Government development.

Based on these assumptions, concepts, models, frameworks and methodologies need to be developed to evaluate, in the specific context of local authorities, the quality of Electronic Government services, in order to improve the level of satisfaction attached to these services.

This paper is part of an investigation process for the creation and/or adaptation of an approach to evaluate the quality of Electronic Local Government Services, and reflects upon a list of potential quality dimensions to be submitted to a Delphi Method process, in a next stage to be carried out with the purpose of achieving a final list.

II. METHODOLOGY

In a first stage, we carried out a literature review, analysing a carefully selected sample of books, dissertations, theses and papers in this area, which allowed us to identify quality evaluation approaches for traditional, electronic and e-Government services. Concomitantly, this literature review enabled the development of a list of potential dimensions for local contexts.

With a view to complete this list, an empirical study was also carried out based on a series of interviews to Local Government experts, technicians and users. This universe of respondents was selected though a convenience sampling. Despite the limitations attached to this type of sampling, to the extent that the results and conclusions are representative of the respondents only, we adopted this strategy because this is a preliminary and pilot study subject to subsequent validation by the Delphi process. A significantly advantageous aspect of the convenience sampling is the obtainment of a greater number of answers.

Based on the collected and analysed elements, we prepared a preliminary list comprised by thirty dimensions, divided into four domains.

III. E-GOVERNMENT AND LOCAL E-GOVERNMENT

At first glance, the definition of e-Government seems clear and unequivocal, but when compared with other investigation fields of Information Systems and Information Technologies, it reveals a terminological and conceptual multiplicity. It is

thus necessary to clarify and unify fundamental concepts. To Rocha, Silva, Lamas, Castro and Silva [8], e-Government, following an encompassing perspective, involves the adequate and advantageous adoption of information and communication technologies by government agencies - central, regional or local – both in their internal and external relations, and particularly in their relationship with citizens. From the point of view of Jinmei [9] e-Government means the online supply of government information and services through the internet or other digital media. Santos, Melo and Dias [10] refer that the function of an Electronic Government is to restructure the organization of public services, adopting mechanisms that promote communication amongst different entities, thus simplifying processes.

Although Local e-Government services may be perceived as an extension of central government services, the former have a number of specificities that need to be stressed. In this sense, in the local public services context, the Government provides electronic services that are heavily influenced by their powers, typology, different territorial and local distribution, disparate levels of literacy and age amongst populations, different organizational structures, a strong proximity with citizens and local companies, different IT maturity levels, disparate channels for the provision of services and, last but not least, their strong influencing role over local and national legislation policies [11]. For Nabafu and Maiga [12], Local e-Government lets citizens of all levels interact with public services, easily and electronically. In their turn, Shackleton and Dawson [13] refer that Local e-Government is more than an electronic replication of existing information and services, as this new means offers new and improved services to the public, with a view to increase the involvement of communities when preparing policies and to provide better services. According to Dias and Gomes [14], the definition of e-Government, consisting of "using information technologies to support government operations, involve citizens and provide public services", remains valid for the Local Government context.

In the e-Government domain, Al-Jaghoub, Al-Yaseen and Al-Hourani [15] mention the following types of activities and relationships: Government-to-Citizens or Government-to-Clients, Government-to-Businesses/Companies, Government-to-Employees, Government-to-Government and Citizen-to-Citizen. Zaidi and Qteishat [16] define only three: Government-to-Citizen, Government-to-Businesses/Companies and Government-to-Government. Unlike so-called traditional services provided by the government, the provision of e-Government services in non-hierarchical, in both directions, and should be available twenty-four seven [9].

The evaluation of electronic services should be based on academic approaches and dimensions that offer a real perception of the quality behind provided services, which may consequently promote a sustained development, suited to the real needs of citizens.

IV. POTENTIAL DIMENSIONS FROM THE LITERATURE REVIEW

Since the dawn of civilization, human beings resort to others for the provision of services. These vary from their most traditional format to modern day electronic formats. According to Parasuraman, Zeithaml and Berry [17], when the consumer purchases a good through traditional channels, he evaluates this purchase against several factors, such as style, texture, colour, labels, package, etc. Conversely, the acquisition of services is oftentimes intangible. Parasuraman, Zeithaml and Malhotra [18] contend that the term 'traditional service quality' concerns the quality of every non-internet based client interaction as well as their personal experience with the companies. With the advent and massive dissemination of the Internet, the access to and provision of electronic services is increasing all over the world. Li and Suomi [19] refer that, faced with the fast growth of the internet and the globalization of markets, companies have embraced and adopted new information technologies and media, which allow them to provide electronic services to their customers. Also within the e-Government scope, citizens do not merely perceive governments as autonomous and power entities, but also as service providers. A high quality service on their part will ensure a high level of citizen satisfaction, which will imply a good acceptance of an Electronic Government [20]. From the perspective of Jinmei [9] the quality of a public service must be evaluated according to three aspects: implementation, advantage and citizen satisfaction.

Bearing these in mind, fourteen approaches representing Service Quality were analysed. From this group, nine are specifically connected to electronic services: SITEQUAL by Yoo and Donthu [21]; WebQual by Loiacono, Watson and Goodhue [22]; WebQual by Barnes and Vidgen [23]; eTailQ by Wolfinbarger and Gilly [24]; E-S-Qual by Parasuraman *et al.* [18]; e-TRANSQUAL by Bauer, Falk and Hammerschmidt [25]; the Review of the SERVQUAL scale by Li and Suomi [19]; the Framework of Sam and Tahir [26]; and e-SELFQUAL by Ding, Hu and Sheng [27]. The remaining five approaches concern the e-Government context, and include: E-GovQual by Papadomichelaki and Mentzas [28]; e-GOSQ Framework by Agrawal *et al.* [20]; the Proposal of Alanezi, Kamil and Basri [29]; e-GSQA Framework by Zaidi and Qteishat [16]; the Framework of Hien [30].

These fourteen approaches allowed us to elaborate a list (Table 1) with thirty three dimensions that we believe to be representative of our perception, following a standardization of descriptions and designations, as several authors adopt different designations when referring to the same dimension.

TABLE 1 – DIMENSIONS FROM THE LITERATURE REVIEW

Dimension		Definition
Emotional Appeal		Refers to the intensity of the interaction between a user and the website, as well as the pleasure experienced by the user.
Customer Support		Refers to the ability to promptly help and understand, on an individual and customized level, every client, being always available (24/7), and to promote an effective and positive communication
Alternative Channels		The existence of alternative communication channels is one of the most important dimensions in customer support.
Reliability		The offered service was indeed useful and provided in a precise and consistent manner.
Deadline compliance		Product delivery within the deadline and time advertised and established in the website.
Design		This dimension refers to the aesthetic features of a website, such as the use of colours and appealing multimedia features, as well as aspects concerning its organization.
Service Availability		The service must be available on-line, twenty-four hours a day, seven days a week, running in good technical conditions.
E-Participation		Evaluation of the satisfaction level involving citizen participation in Government actions.
Task Information		The website must offer a correct and effective level of information concerning every procedure and task, so the citizens can find what they need in a simple way, thus improving their satisfaction level.
Innovation		Refers to the creativity and singularity offered by a website to its users.
Online Integrity		Evidence that the user can carry out all or most of the tasks, completely on-line.
Politicians Role		Impacts and actions that a decision making member of an organization can have as a key-variable in the provided services.
Customization		Ability to adapt the services to a specific audience. Concern with the delivery of services that take special care in carrying out and offering a customized attention to customers.
Privacy		Safety of user data stored by the service provider.

Dimension		Definition
Information Quality		The information described in the website referring to a service or a product should be precise, updated and accurate, offering users information that effectively corresponds to the reality of what they intend to purchase.
Technical Quality		Refers to the technical aspects and the technical quality of a website.
Complaints		Ability to deal with a complaint and to effectively treat any existing problem.
Safety		Safety aspects involving transactions and communications between the service provider and the user.
Transparency of Actions		The website must ensure the transparency and legality of all the available transactions and actions.
Usability		Refers to the ease of use and simplicity experienced by a website user.
Advantage of Online Services		The advantage of using on-line services instead of other channels. Refers to the effectiveness and timeliness of a service that is capable of saving time and effort to consumers, when they select the on-line solution
Website Access Speed		Concerns the speed of access to a website. This dimension does not contemplate the processing speed of a request delivery.
Processing Speed		Speed/time that a citizens needs to acquire an online product or service, including its reception.

V. POTENTIAL DIMENSIONS FROM THE EMPIRICAL STUDY

With a view to complete the preliminary list of dimensions found in the literature review, which will be submitted to a Delphi Method Process, we carried out twenty-five questionnaire based interviews with experts and users of online electronic services in the local public services field. In order to select the participants and obtain an encompassing perspective of different Local Government spheres, despite the adoption of a convenience sampling, we chose to interview experts with decision making role in the provision of electronic services within their organizations and users with e-Government services experience. In this sense, the first group we selected was comprised by members of local authorities, software companies and online service users (Table 2).

TABLE 2 – LIST OF PARTICIPANTS

Questionnaire no.	Entities	Positions	Answer Date
Q1	Deloitte and AMA	Special Adviser in Deloitte and former Chairman of the Agency for Public Services Modernisation	11-02-2015
Q2	CIM-RC	Executive Secretary of CIM-RC, former Chairman of CIM-Região Baixo Mondego and former President of the Condeixa-a-Nova City Council	11-02-2015
Q3	CC of Penacova and AIRC	President of the Penacova City Council and Voting Member of the AIRC	20-01-2015
Q4	CC Condeixa-a-Nova and AIRC	President of the Condeixa City Council and Chairman of AIRC	30-01-2015
Q5	CC Penacova	Councillor for Public Services Modernisation	19-01-2015
Q6	AIRC	Marketing Director	21-01-2015
Q7	CC Arganil	IT expert responsible for the IT Department	17-01-2015
Q8	CC Cantanhede	Head of the Municipal Service for Innovation and Quality of Cantanhede Municipality	26-01-2015
Q9	CC Coimbra	Head of the Information Systems Division of the Coimbra City Council.	22-01-2015
Q10	CC Mealhada	Senior Technician in the Technical/Information Systems Support Department	26-01-2015
Q11	CC Penacova	Head of the Works and Zero Licensing Division	20-01-2015
Q12	CC Pampilhosa da Serra	Responsible for the IT Department	19-01-2015
Q13	Deloitte	Senior Consultant in Deloitte	30-01-2015
Q14	Deloitte	Senior Consultant in Deloitte	02-02-2015
Q15	CC Figueira da Foz	To be designated	No Answer
Q16	CC Poiares	Vice-President	No Answer
Q17	CC Penela	Head of the President's Office	No Answer
Q18	Parliament House	Member of Parliament	No Answer
Q19 - Q25	Online Service User	Service users	18-02-2015 to 18-03-2015

The following stage involved the preparation of questions and respective texts to be handed to all participants. As the main goal was to obtain and complete a basic list of dimensions reflecting their experience and knowledge in the field of electronic services quality, the following questions were formulated:

1. Do you have a decision making role or any responsibility involving the provision of online electronic services in your institution? Can you specify?

2. In your opinion, in what concerns online electronic services provided by Local Authorities, which quality criteria do you believe to be of importance from the perspective of a citizen? If possible, explain.

3. In what concerns online electronic services provided by Local Authorities, which quality criteria do you believe to be of importance to improve internal procedures of a Local Authority? If possible, explain.

4. Identify particularities and differences between the provision of Electronic Services by Central Governments and Local Public Services.

These questionnaire based interviews were administered at a distance or in the respective workplaces and took an average of twenty minutes each. Even though in a first moment the twenty five members agreed to participate, we only obtained twenty one answers, amounting to a total of 84%.

The interviews were subsequently transcribed and formatted in the computer, and validated by the authors to make sure everything followed what was previously established.

To carry out a coherent examination of the interviews, we analysed and searched for key-points which allowed us to list and rank dimensions for the Electronic Local Government context. After analysing the twenty one answers obtained, we identified twenty two potential dimensions (Table 3).

TABLE 3 – DIMENSIONS FROM THE EMPIRICAL STUDY

Dimensions	1	2	3	4	5	6	7	8	9	10	11	12	13	14	19	20	21	22	23	24	25	
Information Quality	1	1	1	1		1	1	1	1	1		1			1	1	1	1	1		1	15
Usability	1	1	1					1	1	1		1	1	1	1		1	1	1		1	14
Process Management		1	1		1	1	1		1	1	1	1				1		1	1			12
Privacy		1			1		1	1	1	1	1	1					1	1	1			11
Safety		1			1		1	1	1	1	1	1					1	1				10
Transparency	1	1			1		1				1	1				1		1	1			9
E-Participation		1	1		1					1		1				1		1		1	1	9
Deadline Compliance		1		1	1	1	1	1	1	1	1											8
Reliability	1	1	1	1								1	1				1			1		8
Service Availability		1		1			1	1			1	1				1					1	8
Online Integrity		1				1	1					1	1		1		1	1				8
Task Information	1	1		1		1	1		1		1											7
Interoperability		1	1		1							1	1			1		1				7
Customer Support			1						1			1	1		1	1	1					7
Customization				1	1							1							1	1	1	6
Accessibility		1					1				1							1			1	5
Compatibility			1		1						1							1				4

Dimensions	1	2	3	4	5	6	7	8	9	10	11	12	13	14	19	20	21	22	23	24	25	
Empowerment	1	1								1												3
Politicians Role		1															1			1		3
Variety of Services Offered										1	1						1					3
Alternative Channels	1																					1
e-Democracy																	1					

The Information Quality dimension could be found in 71,42% of the questionnaires and it was the most frequently reported by respondents as crucial for citizen satisfaction. This dimension was mentioned by politicians, technicians and users. Usability appeared in 66,67% of the questionnaires. On the other hand, Process Management, which had not been found in the literature review, was mentioned by all the participant categories, technicians, politicians and users (citizens), reaching a percentage of 57,14%. In 53% and 47% of the questionnaires we found aspects concerning the Safety of Transaction and Data Privacy. The dimensions Transparency and e-Participation were mentioned in 42,86% of the answers.

Four dimensions were identified with 38,10%s: Deadline compliance, Reliability, Service Availability and Online Integrity. Closely following, with 33,33%, appeared Task Information, Interoperability and Client Support. Below the 30% came Customization with 28,57%, Accessibility with 23,81%, Compatibility with 19,05%. Empowerment, Politicians Role and Variety of Services Offered were identified in 14,29% of the answers. Finally, the dimensions Alternative Channels and E-Democracy were found in only one questionnaire.

From these twenty two dimensions, seven had not been found in the literature review; these will be included in the preliminary basic list to be submitted to the Delphi Method Process:

Process Management: Internal processes of local authorities must be correctly implemented and designed to enable an aligned provision of services. It is important to note that 57,15% of the respondents mentioned this dimension in connection with the internal management of organizations, a fact that underscores its significance in terms of quality;

Interoperability: Integrating and sharing multiple electronic services in a single portal in a transparent way for the citizen. The available services should share resources, in order to simplify their use and access. This dimension is extremely important in our present times, and there are several ongoing projects in this field involving Portuguese central public services. Its relevancy is also noticeable from the fact that five of the respondents referred to this dimension as being fundamental for service quality. Questionnaires two and eleven included specific references to projects comprising this aspect, namely *Balcão do Empreendedor* and *Licenciamento Zero*. Questionnaire number three mentioned a different project in the interoperability field currently in force in Portugal, the single authentication "citizen card key";

Accessibility: A correct accessibility should be ensured, promoting equality of access to people with physical disabilities. As stated by the Executive Secretary of CIM-RC, in questionnaire number two, this concern should be present from the very design to the implementation of the services. Despite being referred in only 23,81% of the questionnaires, this aspect should never be overlooked;

Compatibility: Services should be developed in order to be offered and accessed independently of the technologies involved. This factor is becoming more and more critical. As mentioned by 19,05% of the respondents, citizens are increasingly using more browsers and devices to access services. For instance, nowadays it would be unthinkable to have a service running in Internet Explorer and not in Google Chrome, or working in a PC and not working in mobile devices;

Empowerment: Adequate internal human resources training, both technical and elected, is perceived as capable of positively or negatively impacting the final quality of a service. Knowing what to do helps improve services at all levels. This dimension, included in the internal management of organizations domain, can positively or negatively impact satisfaction, as 14,29% of the obtained answers confirm.

Variety of Services Offered: The same variety of electronic and traditional services should be made available; although this dimension was only mentioned by two respondents, 14,29%, it is clear to us that citizens react in a positive manner towards a wider offer of electronic services and negatively towards a more limited offer.

e-Democracy: Citizens should be given the opportunity to carry out their mandatory or optional democratic duties, according to the laws and constitutions enforced by Local Authorities, resorting to technological means and online electronic services strategies to ensure citizen satisfaction. Despite having been directly identified in only one questionnaire, from our perspective this dimension constitutes one of the most important criteria for democratic and participatory governments in the present times.

VI. Domains of the Dimensions

In order to better organize and allocate the dimensions found in literature and in our empirical study, which impact the quality of a Local Electronic Government service, the following step involved the identification of possible allocation domains. With a view to this, we contemplated four domains:

1. Service quality: Aspects directly impacting the service effectively provided by a local electronic government;
2. Information quality: Quality and content of the information made available to users on the *website* or portal offering local electronic government services;
3. Management quality: Aspects concerning internal specificities of Local Government management;
4. Technical quality: Technical aspects of the service provision, such as ease of use, web design, speed, etc.

VII. CONCLUSION

The herein presented investigation work tried to attain the proposed goals and create a list of potential dimensions for the development of an approach suited to the evaluate Local Electronic Government services. In order to do this, we initially carried out a bibliographical review in which we analysed several papers, books, dissertations and theses with the purpose of identifying a theoretical basis. After completing this bibliographical review we observed that a number of authors adopted different designations when referring to the same dimension or attached a highly vague description to dimensions. Notwithstanding, we obtained a list of dimensions that reflects our perception of the fourteen approaches which are representative of the electronic services evaluation under analysis.

In order to complete the list of dimensions obtained from the literature review, we performed a set of interviews to a group of experts, technicians and users in the Local Government field, and the results were considerably enriching to the extent that, from the twenty two dimensions found, seven had not been identified in the literature review.

We thus concluded a preliminary list with thirty potential dimensions divided into four domains (table 4)

TABLE 4 – FINAL LIST OF POTENTIAL DIMENSIONS

Management Domain	Information Domain	Service Domain	Technical Domain
Emotional appeal	Task information	Reliability	Accessibility
Customer support	Information quality	Deadline compliance	Compatibility
Alternative channels		Service availability	Website Innovation
Empowerment		Online integrity	Technical quality of the Website
E-Democracy		Interoperability	Usability
Process management		Customization	Website access speed
Politicians role		Privacy	*Website* Design
Complaints		Safety	
Transparency		Variety of services offered	
Advantage of online services		Processing speed	
E-Democracy			

VIII. FUTURE STUDIES

To the extent that this is a preliminary study, it needs to be redefined and improved, to expand new methodologies and/or frameworks adopted in the evaluation of electronic services, namely in the Local Electronic Government context. A preliminary list of potential dimensions for a local electronic government service quality model was defined and the next stage will involve the submission of this list to a Delphi Method Process, with a view to validate and expand the dimensions and respective domains. In a subsequent stage we

will define the final dimensions and initiate the design of an approach suited to evaluate Electronic Government in local contexts. Finally, we will validate this approach in a real context (Figure 1)

Figure 1 – Stages of the Study

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Highlights

The study presented in this article will serve as a basis for the development of a suitable methodology whose purpose is to evaluate the quality of local e-Government online services. Citizens expect quality public services, and their online dimension is no exception.

This first study puts forth a systematization of the relevant bibliography, focusing on the quality of three types of services: traditional electronic and e-Government. Each methodology was analysed in order to identify the main quality dimensions used.

Up to the present moment, we were unable to identify a service quality evaluation method particularly focused on local online e-Governments, and this justifies the development of an investigation project whose main purpose is to create such a methodology in this field.