Quality Models of e-Government Online Services

Towards a Local Focus

Filipe Sá
Município de Penacova
Penacova, Portugal
filipe@cm-penacova.pt

Álvaro Rocha
Universidade de Coimbra, Coimbra
LIACC – Laboratório de Inteligência Artificial e Ciência de Computadores
Portugal
amrocha@dei.uc.pt

Manuel Pérez Cota
Universidad de Vigo
Vigo, Spain
mpcota@uvigo.es

Abstract— 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. The quality of these services should be analysed and accounted for, in order to maximize and develop strategies that improve the offered services, increasing the levels of satisfaction of their recipients. In this sense, this first study puts forth a systematization of the relevant bibliography, focusing on the quality of two types of services: traditional 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.

Keywords— E-Government; E-Service; Service Quality; Public Administration; Local Government

I. INTRODUCTION

The provision of services in governmental portals is a constant which has influenced the strategies of electronic services offered by several Governments all over the World. More than offering services, development related policies have tried to widen the scope of their actions, bringing together the necessary aspects for an accurate alignment between the implementation of public services and the needs of the population. Consequently, Local Public Administrations are nowadays faced with a challenge of administrative modernization, which tries to draw citizens closer to their services and, concurrently, to dematerialize their processes [1, 2].

Over the last years, the quality of services in the public sector has given way to significant concerns. Many organizations have started to self-assess and measure the quality of the services they provide [3].

The European Commission (2013) [4], in a press release, declared that in the universe of EU Citizens, 46% use the Internet to look for a job, to use the public library, to submit tax declarations, to register births, to request a passport or to use other public administration services. In the same document, it is said that 80% of the citizens believe that the public services offered on the Internet allow them to save time, 76% appreciate their flexibility and 62% claim to save money with them. Consequently, it is of the utmost importance to create and study methodologies and concepts that measure, in the context of local municipalities, the quality of online e-Government services, in order to improve both the services and the satisfaction level.

In the course of this study, we carried out a bibliographic review and analysed relevant methodologies that are used to measure the quality of two types of services: traditional and e-Government services. The present paper is the first step in a path that will lead to the creation or adaptation of a methodology that is capable of globally evaluating the quality of services in a local online e-Government context, by focusing on the dimensions of several existing methodologies. The main purpose of this paper is, therefore, to put into context and prepare the way for a more in-depth study which adapts or creates, if necessary, a comprehensive evaluation methodology for local online e-Governments.

Accordingly, in the following sections, we set the framework and define quality according to two types of services - traditional and e-Government services - and analyse relevant methodologies that were validated in several studies, focusing particularly on the main dimensions used by the authors to put into practice their service quality measurements. This being the first step in a long path, it is our intention that, by the end of this paper, the reader understands the direction and the method that will be followed in order to use, adapt or create a methodology that is capable of measuring the quality of local online e-Government services.

II. SERVICE QUALITY

Ever since the dawn of civilization, human beings resort to others for the provision of services. These services vary from their most traditional format to modern day electronic services.

According to Parasuraman, Zeithaml and Berry (1985) [5], when the consumer purchases a good in the traditional way, he evaluates that purchase according to several factors, such its style, texture, colour, tags, package, etc. On the other hand, the purchase of services is often intangible.

Parasuraman, Zeithaml and Malhotra (2005) [6] contend that the term 'traditional service quality' includes the quality of every interaction experienced by clients outside of the Internet, as well as their personal experiences with companies. When a citizen resorts to an organization for the provision of a service, whether the interaction follows the traditional or the electronic format, there is a constant need to evaluate the quality of this
interaction. The perspective of the client concerning the quality of the service that was provided is fundamental to measure his satisfaction.

Parasuraman, Zeithaml and Berry (1988) [7] had previously mentioned that the quality of the service is determined by the difference between the expectations of the clients, the performance of the provider and the assessment of the obtained service. Invariably, the perception of quality towards a provided service involves two perspectives: that of the provider and that of the recipient of the service. This duality raises several questions, and in order to be guaranteed, the quality of a service should be achieved through a balance between expectations and actual satisfaction.

Client satisfaction is the main factor when determining the success of organizations in terms of customer relationship [8]. The term ‘service quality’, independently of its environment, has been recognized as one of the main factors behind the sustainability of a company, and also one of its driving forces [9]. The need to evaluate quality turned into a success factor and service quality received a significant level of attention during the eighties, becoming a fundamental strategic differentiation factor in terms of market share and profit growth [10, 11].

To Siadat (2008) [8], satisfaction means obtaining what is wanted with the maximum possible satisfaction of the client. If this is not achieved, the services and the products must be improved.

One of the first models that allowed to measure the quality of services was created in 1985 as a conceptual model, in a study developed by Parasuraman, Zeithaml and Berry (1985) [5]. At the time, almost every service provided followed the traditional method, and literature and public conscience were not yet aware of the relevance of service quality, so, to develop this model, Parasuraman et al. (1985) [5] had to carry out an empirical study based on multiple interviews.

First, these interviews were divided in two groups: consumers and service providers. Within the two groups, the interviews tried to encompass different fields, in order to obtain homogeneous results. With the purpose of developing the model, and after studying the results of the interviews, Parasuraman et al. (1985) [5] identified five GAPS (Fig. 1), divided in GAP 1 to GAP 4, on the part of the service provider, and GAP 5, on the part of the consumer. These discrepancies emerged from the different perceptions held by the companies providing the services towards their job and by the consumers towards the quality obtained.

![Fig. 1. – Service Quality Model [5]](image1)
The five identified gaps were:

Gap 1 – The different perspective of the consumer expectation and the perception of these expectations by the management/service provider, creates a gap and, consequently, a bad definition of service quality;

Gap 2 - The difficulty or inability to clearly evaluate the perception of the managers when they create the specifications of the services;

Gap 3 – The discrepancy between service quality specifications and the service that is actually delivered. Human factors, and more specifically the performance of the service provider, may generate a certain antipathy towards the defined standards;

Gap 4 – The potential disparity between the provided and the communicated service. This disparity may alter the expectations of clients. The service provider should not offer more or raise expectations beyond the service that can actually be delivered.

Gap 5 – The perception of quality that a consumer develops towards a service depends on the magnitude and direction of the gap between the expected and the experienced service.

During their model creation process, [5] mentioned that the perception of service quality follows the comparison between the expected and the experienced service (Fig. 2).

![Fig. 2. – Perception of Service Quality [5]](image2)
The conceptual model developed by Parasuraman et al. (1985) [5] comprises ten dimensions which reflect the quality of a service, namely:

1) Access: The ability to and ease of access to the services;
2) Communication: The ability to clearly communicate with and listen to clients;
3) Competence: The technical ability and aptitude to correctly deliver the intended service;
4) Courtesy: Friendliness, respect, understanding and consideration shown to the client.
5) Credibility: Honesty and acknowledgement on the part of the service provider;
6) Reliability: The ability to deliver the offered service in the scheduled date and time, independently of any problems that may arise;
7) Responsiveness: The ability to help every client in an unhesitating way and to effectively and positively promote the service;
8) Security: The perception of safety during the provision of the services;
9) Tangibles: The physical appearance of equipments and staff involved in the provision of services;
10) Knowing the Customer: The ability to identify the existing clients and their respective needs.

After their study, Parasuraman et al. (1985) refined their service quality evaluation method and created SERVQUAL [7]. Thus, carrying out new studies, with new data collections and analysis, they were able to improve their scale, reducing the initial ten dimensions to seven: 1) Tangibles; 2) Reliability; 3) Responsiveness; 4) Communication, Credibility, Safety, Competence; 5) Courtesy; 6) Knowing the customer; and 7) Access.

In a second stage, which entailed another improvement of the study, SERVQUAL was reduced to five dimensions:

1) Tangibles: the physical appearance of equipments and staff involved in the provision of services;
2) Reliability: The ability to deliver the offered service in the scheduled date and time, independently of any problems that may arise;
3) Responsiveness: The ability to help every client in an unhesitating way and to effectively and positively promote the service;
4) Assurance: The ability to inspire trust, security and technical quality on the part of the staff when delivering a service;
5) Empathy: The available and unhesitating assistance provided to the client, individualized and focused on his main interests.

With the evolution of the Internet, electronic services spread and increased all over the world. Available methodologies need to be capable of measuring services not only in their traditional format but also in their electronic dimension. Bearing this in mind, the following section will analyse the quality of electronic government services, based in relevant methodologies in the field.

III. QUALITY OF E-GOVERNMENT SERVICES

Owing to the ever-growing technological evolution and the daily access to public services by the population, governments worldwide face a permanent challenge of transformation and reinvention, in order to deliver services in an efficient, efficacious and cost effective way. Citizens, who are mere service users, are the ones who evaluate this provision, and they are increasingly informed and demanding. Considering the scope of this article, it is therefore fundamental to define what is understood by e-Government and to analyse the available methodologies that evaluate the quality of services in this field.

To Rocha, Silva, Lamas, Castro and Silva (2005) [12], an e-Government, in its broader meaning, consists of a suitable and beneficial use of information and communication technologies by governmental bodies – whether these are central, regional or local – both in their internal and external relations and, particularly, in the relation they establish with the citizens.

According to the report prepared by Unidade Missão Inovação e Conhecimento (2003) [13], in its Action Plan for Electronic Government, an e-Government is a “process supported by the development of information technologies, which places citizens and companies in the centre of attention, improves the quality and the convenience of services and reinforces an active participation in the exercise of citizenship. Simultaneously, it increases efficiency, reduces expenditures and contributes to the modernization of the State”.

Thus, an e-Government can be defined as the use of information and communication technologies by governments with the purpose of improving the quality of the services and the information provided to citizens, and other interested parties, efficiently and profitably [14].

Al-Jaghoub, Al-Yaseen and Al-Hourani (2010) [15] define an e-Government as the use of any type of information and communication technology to improve the services and operations provided to multiple users, namely citizens, companies and other governmental bodies.

In their turn, Alshehri, Drew, Alhussain and Alghamdi (2012) [16] contend that an e-Government is understood as a "means to deliver government related information and services". Similarly, Isaac (2007) refers that the use of an e-Government, particularly in its Web based dimension, serves to improve the access to governmental information and services by citizens, business partners, staff and other governmental bodies [17].

In the e-Government context, according to the activities and the type of relationships, Al-Jaghoub, Al-Yaseen, and Al-Hourani (2010) [14] consider the following: Government-to-Citizens or Government-to-
In 2009, Papadomichelaki and Mentzas created and contextualized the e-GovQual as a model developed to measure the quality of e-Government services [18].

In an early stage, after a bibliographical review, six dimensions were defined:

1. Ease of Use: How easily citizens interact with the Website;

2. Trust (Privacy/Security): Like Alanezi, Kamila and Basri (2010)[9], Papadomichelaki and Mentzas (2009) [18] mention the level of security and personal user data protection offered by Governmental Websites, as well as the trust that the citizen has towards a service that is free from risk, doubt or danger, during the entire electronic process;

3. Functionality of the Interaction Environment: The quality of the interaction between the citizen and the service delivered by an e-Government portal. Online forms should include help to aid the citizens when they are filling out the fields in any given moment, as well as alternative choices as to what a citizen may or can do with the form (i.e.: print, save, etc.);

4. Reliability: The service that is offered and promised must be delivered accurately, consistently and in a timely manner. This dimension concerns the correct technical running of the operation and accuracy of service delivery. A relationship of trust must be created between the citizen and the electronic government Website;

5. Content and Appearance of Information: The quality of the information provided, as well as its presentation. This information must be complete, accurate, concise and relevant. Li and Suomi (2009) [23] and Alanezi, Kamil and Basri (2010) [9] had already mentioned some of these information quality related attributes. It is also important to note that Papadomichelaki and Mentzas (2009) [18] state that this dimension should bear in consideration the layout, which should include a number of specific characteristics, namely: suitable colours, correct graphics and a proper Website size;

6. Citizen Support (Interactivity): The help provided by the organization, with the purpose of supporting the citizens in their information queries concerning the organization or the assistance provided during transactions. This help can merely consist of user guidelines, help pages, frequently asked questions or improved communication methods.

The simultaneous use of these six dimensions (Fig. 3), with their respective items, enables the measurement of e-Government related services.

![Fig. 3. – e-Government Services Quality [18].](image-url)
In order to validate and confirm this methodology, the authors prepared a questionnaire, whose data analysis allowed them to examine and verify the reliability of the six initial dimensions, as well as their respective items. Consequently, they redefined the methodology reducing the dimensions to four: 1) Reliability; 2) Efficiency; 3) Citizen Support; and 4) Trust. These four dimensions comprise twenty five items.

In 2010, Alanezi, Kamil and Basri elaborated a proposal to measure the quality of e-Government services. This proposal was developed based on the analysis of several scientific and academic studies in the field of electronic services. From this analysis, Alanezi, Kamil and Basri (2010) [9] developed a proposal with seven dimensions, based on the SERVQUAL methodology of Parasuraman, Zeithaml and Malhotra (2005) [6]. Alanezi et al. (2010) [9] adapted the five dimensions of SERVQUAL, and added two new ones:

1. Website design: Technical operation and appearance of the e-Government WebSite;
2. Reliability: The satisfaction towards a timely delivery of the service. For instance, the action of emailing or contacting the customer by phone, increasing the trust in the delivery of the right products with appropriate charges;
3. Responsiveness: If the delivered service was truly useful and was not delayed. If the service actually answers questions in a useful and timely manner;
4. Security/Privacy: Level of security and personal user data protection offered by government Websites. Li and Suomi (2009) [23] refer to this dimension as the perception that the clients have of being free from danger and safe during all the processes pertaining to the service provision;
5. Customization: The will to provide services with special care and an individualized attention to consumers. In the SERVQUAL methodology this dimension is referred to as empathy, but it is not focused on electronic services. According to Alanezi, Kamil and Basri (2010), this change takes place because online services do not entail a direct contact between the client and the staff [9];
6. Information: Information provided by the e-Government service. It must be accurate, current and easy to understand. Li and Suomi (2009) [23] mention that quality information must contain some attributes, such as: currency, timeliness, accuracy, relevancy and ease of understanding;
7. Ease of use: The ease of use level of e-Government WebSites. Any Website should be user friendly, in order to guarantee his satisfaction.

Alanezi, Kamil and Basri (2010) [9], in their proposal, also mentioned which items should be applied to each dimensions.

In 2012, Zaidi and Qteishat [14] developed the e-GSQA Framework. The purpose of their study was to determine the quality of services from the point of view of citizens. It is important to notice that these authors perceive e-Commerce and e-Government as belonging to the same field in practical terms, to the extent that the service delivery channel is the same. By carrying out a review of the available literature and several studies, the authors developed this Framework, modifying and joining the E-S-Qual [6] and E-GovQual [18] models and the norm ISO/IEC 9126 [24]. This study adapted, created and validated the following dimensions: 1) WebSite Quality; 2) Design; 3) Reliability; 4) Responsiveness; 5) Security; 6) Privacy; 7) Efficiency; 8) Ease of Use; and 9) Citizen Confidence.

Zaidi and Qteishat (2012) [14] carried out its validation, interviewing electronic tax service users (e-tax) from India.

After designing and developing the framework, [14] carried out its validation, interviewing electronic tax service users (e-tax) from India.

### IV. Conclusions

The main goal of the present paper was the bibliographical systematization of methodologies developed to evaluate the quality of traditional and e-Government services. Accordingly, we initially defined what we perceived by traditional and e-Government services, presenting the relevant methodologies in the fields.

In terms of traditional service quality, first we analysed several models and methodologies, having initiated our study with the conceptual model developed by Parasuraman, Zeithaml and Berry (1985) [5], which comprises ten dimensions. This conceptual model served as a base for the SERVQUAL methodology, with five dimensions, (Tangibles, Reliability, Sensibility, Responsiveness, Security, Empathy), developed by Parasuraman, Zeithaml and Berry (1988) [7]. Both methodologies served as a base for several new methodologies/frameworks and multiple studies.

Finally, in the e-Government context, we analysed the E-GovQual methodologies developed by Papadomichelaki and Mentzas (2009) [18], with six dimensions, and the model proposed by Alanezi, Kamil and Basri (2010) [9], with seven dimensions, which, according to the authors, adapts the five SERVQUAL dimensions and adds two new. The last
methodology we analysed was the GSQA from Zaidi and Qteishat (2012) [14], whose definition joins the E-S-Qual and E-GovQual models and the norm ISO/IEC 9126.

Despite being different, these proposals comprise common dimensions, such as security/reliability, information, tangibles, system availability, amongst others. Although this study was intended as systematization work of the available knowledge, so far we were unable to identify a specific methodology solely focused on local online e-Government services.

V. FUTURE WORK

The present paper belongs to the first stage (see Fig. 5) of a process that will allow us to conceive/adapt or use a methodology that is capable of evaluating an online e-Government in the context of local municipalities. Being a preliminary study by nature, it needs to be redefined and improved, further developing new methodologies and/or frameworks to be used in the context of electronic services evaluation, namely in the e-Government field.

![Fig. 5 – Stages of the Study.](image)

In a later stage, we will define the necessary dimensions to initiate the development of a methodology that will be capable of evaluating online e-Governments in a local context. After their validation, the definition and creation of specific items for each dimension will be necessary. Finally, a methodology will be validated in a real context. In the course of this process, the end of each stage (Fig. 5) will entail its validation or redefinition.

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