# The Effects of E-Governance on Customer Satisfaction: The Case of Addis Ababa Water and Sewerage Authority

***By Jemal Abagissa, PhD***

The emergence of electronic governance has been one of the important developments in public administration in the past decades which helped governments as a means of reducing costs, improving service provision for citizens and increasing effectiveness and efficiency. The purpose of this study is to assess the effects of e-governance on customers' satisfaction. The target population comprises customers from the Addis Ababa Water Supply and Sewerage Authority (AAWSSA in its Arada branch. Both quantitative and qualitative data were collected to analyze the effects of e-governance on a sample of 330 users of water billing. Data were analyzed using the five attributes of SERVPERF model. The study revealed that e-governance has brought positive effect on service delivery by enhancing the customers' perception on the service delivery and their satisfaction even though the satisfaction level is moderate. The satisfaction level is moderate because the office encountered challenges such as customer e-service illiteracy of the customers, poor internet infrastructure and dependence on external e-service plat form suppliers.

Key words: E-governance, Service delivery, Customer, Customer satisfaction, SERVPERF, AAWSSA.

## Background of the Study

E-Governance is the public sector's use of information and communication technologies with the aim of improving information and service delivery, encouraging citizen participation in the decision-making process and making government more accountable, transparent and effective (Mesfin, 2010).

In other words, e-Governance refers to the use by government agencies of information technologies that have the ability to transform relations with citizens, businesses, and other arms of government. These technologies can serve a variety of different ends: better delivery of government services to citizens, improved interactions with business and industry, citizen empowerment through access to information and more efficient management.

Governments take resources from citizens and transform them into products and services to create public value. Public value includes the quality of citizens' experiences of public services, and it can be created and improved by improving public services quality. Since the emergence of electronic government, the significance of providing quality services online to citizens has been recognized by many government sectors.

In 2013 a public private partnership (PPP) was launched with the Ethiopian Ministry of Information and Technology known as "LEHULU" or one window service for AAWSA, EELPA, ethio-telecom, and ETV for bill payments.

Like many other agencies of the city administration of Addis Ababa, Addis Ababa Water and Sewerage Authority practiced the E-governance system in order to provide its services easily and conveniently. Among the services provided by the authority, bill payment is the one which is processed through mobile banking and CBE-birr in collaboration with commercial banks of Ethiopia.

The objective of this research is to examine the effects of the application of e-governance on customers' satisfaction in Addis Ababa water and sewerage authority (AAWSA) at Arada branch.

This research applies the SERVPERF model which is the subset of the SERVQUAL model to examine the effect of e-governance on customers' satisfaction. The detail of these models will be discussed in the literature section of this study.

## Short highlights on e-governance and SERVQUAL model

Traditionally citizens go to a government office to transact with government offices to get a certificate, apply for or renew a passport and driving license or to pay utility bills. Today using ICT systems, it is possible for the same interaction to take place in a service centre close to the citizen using the internet or even at a kiosk. These services are provided in different modalities.

## Modalities of E-government Initiatives

The emergence of Information and Communication Technology has provided means for faster and better communication, efficient storage, retrieval and processing of data and exchange and utilization of information to its users, be they individuals, groups, businesses, organizations or governments.

E-government is broadly defined as the continuous optimization of service delivery, constituency participation, and governance by transforming internal and external relationships through technology, the Internet, and new media. Although e-government encompasses a wide range of activities and actors, four distinct sectors can be identified. This includes Government to Government (G2G). Government to Citizen (G2C), Government to Employee (G2E) and Government to Business G2B).

1. Government to Government (G2G): this modality is considered as the backbone of e-government. Governments run and update their own internal system and procedures before electronic transactions with citizens and businesses to be successful. This includes the use of information technologies by different governmental agencies to share or centralize information, or to automate and streamline intergovernmental business processes such as regulatory compliance, and has produced numerous instances of time and cost savings and service enhancements.

2. Government to Citizen (G2C): this modality deals with the relationship between government and citizens. G2C allows citizens to access government information and services instantly, conveniently, by using multiple channels. It is a way governments share information and deliver services to achieve greater transparency and convenience in transacting with citizens. These initiatives attempt to make transactions, such as renewing license issuance, certifications, paying taxes and bills and applying for social benefits using ICT systems.

3. Government to Business (G2B): this type of e-government initiative involves business sector using e-governance as a venue for reducing costs through improved interactions with government organizations. On the other hand the government applies this initiative to transact goods and services such as Tendering, auction, and information and administrative management tools that involve the private sector.

4. Government to Employees (G2E): It is a combination of information and services offered by government institutions to their employees to interact with each other and their management. G2E is a way to provide e-learning, bring employees together and to encourage knowledge sharing among them. It gives employees the possibility of accessing relevant information regarding compensation and benefit policies, training and learning opportunities, and allowing them access to manage their benefits online with an easy and fast communication model. G2E also includes strategic and tactical mechanisms for encouraging the implementation of government goals and programs as well as human resource management, budgeting and dealing with citizens (Ndou, 2004).

## SERVQUAL and SERVPERF Models

This section presents a review of the existing literature about service quality and its measurements. It examines service dimensions and its measurement approaches. Two prominent service quality measurement approaches are also presented and compared.

## Service Quality Measurements

Many different methods exist to measure, control and improve quality in various fields. Among the different approaches of service quality that measure the external perspective, the one given by PZB (1985) seems particularly useful. They (PZB) define service quality as the degree of discrepancy between consumers' perceptions and expectations

in terms of different but relatively important dimensions of service quality.

According to the authors, customers' perception of service quality depends on the nature of the discrepancy between the expected service and service perceived by the client (Parasuraman et al., 1985). Service quality is thus operationalized as performance (P) – minus expectation (E). Thus by this perspective, the way to maximize quality is to maximize the difference between these measures, P and E. In order words, it means exceeding the customers' expectations. Service quality is therefore a function of pre -purchase customers' expectations and perceived process quality.

The SERVQUAL instrument was originally measured on ten (10) aspects or dimensions of service quality: reliability, responsiveness, competence, access, courtesy, communication, credibility, security, understanding, and tangibles (Parasuraman et al., 1985) as a means of measuring the gap between customer expectation and experience.

The original construct was found to be complex, subjective and statistically unreliable, and as a result it was simplified and modified to the five dimensions which are measured on five (5) aspects, namely - reliability, assurance, tangibility, empathy and responsiveness.

## The five Dimensions of Service Quality

As stated above the revised SERVQUAL scale consists of five dimensions, namely, tangibility, reliability, responsiveness, assurance and empathy. What are these dimensions?

### A. Tangibles

Tangibility can be defined as physical facilities, equipment and the appearance of employees and management team. Further, it is also defined as the ease in visibility of resources necessary for providing the service to customers, well groomed employees and ease in accessing written materials like pamphlets, brochures, folders, and information books will have a favorable consequence on the level of customer satisfaction (Parasuraman et al., 1985). Modern looking or sophisticated equipment and visually appealing or attractive ambience are viewed as the positive impacts of tangibility on customer satisfaction in the banking sector.

### B. Reliabilty

Reliability is defined as the ability to perform the required service to customers dependably and accurately as promised to deliver (Zeithaml et al., 1990). Dealing with whatever problems in services are encountered by customers, performing the required services right the first time, services being rendered at the promised time and maintaining an error-free record are the paradigm of reliability in terms of service quality which will strongly influence the level of customer satisfaction (Parasuraman et al., 1988). Accuracy in completing orders, maintaining precise records, accuracy in billing, maintaining promised services are the basic views of reliability which is considered as the most important factor in convincing customers to remain.

### C. Responsiveness

Responsiveness refers to the interest shown in providing prompt service to customers when required. It also includes the willingness and readiness of employees to provide the required customer service without any inconvenience at any time.

### D. Assurance

Assurance is defined as the knowledge and good manners or courtesy of employees. It is also defined as the ability of employees with the help of the knowledge possessed to inspire trust and confidence that lead to customer satisfaction.

### E. Empathy

Empathy is defined as the ability to take care of customer's attention individually in providing service to customers. Further, it refers to understanding customer expectations better than competitors in providing the required service at any time without any inconvenience. Convenient working hours, individualized attention, better understanding of customer's specific needs, enhanced communication between management and customers will have a positive outcome on customer satisfaction in this regard.

There are also 22 factors or attributes associated with these service quality dimensions. Thus, according to the SERVQUAL Model, quality of services is a construct comprising five dimensions with 22 associated explanatory factors.

***Table 1:*** *SERVQUAL Dimensions, Definitions and Explaining Factors*

| Dimension | Definition | Indicators |
|---|---|---|
| Assurance | The ability to convey trust and confidence. | (1) employees who instill confidence in customers,<br>(2) making customers feel safe in their transactions, including secure delivery of items<br>(3) employees who are consistently courteous, and<br>(4) employees who have the knowledge to answer customer questions |
| Reliability | The ability of employees to perform the promised service timely and accurately. | (1) provision of services as promised,<br>(2) dependability in handling customer's service problems,<br>(3) performing services right the first time,<br>(4) providing services at the promised time, and<br>(5) Maintaining error-free records. |
| Responsiveness | The willingness of the employees to assist clients and provide prompt service. | (1) keeping customers informed about when services will be performed,<br>(2) prompt service to customers, (e.g., convenient pickup and delivery time),<br>(3) willingness to help customers, and<br>(4) readiness to respond to customers' requests, including flexibility in meeting special handling requirements. |
| Tangibles | The physical appearance of the public companies, inclusive of the available facilities. | (1) modern equipment, transportation facilities and warehouse availabilities, use of information technologies, port management,<br>(2) visual appearance of facilities and equipment for transportation, warehousing and communication,<br>(3) employees with regard to neatness and professionalism, and<br>(4) visually appealing materials associated with the service of the ESLSE |
| Empathy | The caring individualized attention that the employee of the public companies staff provides to clients. | (1) giving customers individual attention<br>(2) employees who deal with customers in caring fashion<br>(3) having the best customers interest at heart,<br>(4) employees who understand the needs of their customers, and<br>(5) convenient business hours. |

*Source: adapted from Parasuraman et al. (1985)*

## SERVPERF

An alternative instrument to measure service quality was introduced by one of the SERVQUAL' critics - Cronin and Taylor (1992). Instead of SERVQUAL, Cronin and Taylor introduced the performance-based measure of service quality called SERVPERF.

SERVPERF excludes consideration of expectations. In other words, SERVPERF differs from SERVQUAL in that SERVPERF does not assess gap scores because the expectations portion is not included. The research of Cronin and Taylor (1992) suggested that although expectations can have an effect on consumers' perception of service quality, the performance minus expectations is inappropriate basis for use in the measurement of service quality.

These scholars state that SERVQUAL's hesitance to treat perceived service quality as an attitude is one of the key reasons why the theory is difficult to put into operation.

The views of the service users may change from time to time depending on certain factors such as the mood and past experience of the individual being interviewed. For example a person who is used to a 5 star hotel will find a 4 star hotel of lower quality while a person who has never been to a 5 star hotel will find 4 star hotel a high quality hotel. This is one of the weaknesses of the SERVQUAL model in measuring expectations.

Based on their findings Cronin and Taylor (1992) proposed a tool they called SERVPERF as the replacement of SERVQUAL. They state that the performance-based scale developed is efficient in comparison with the SERVQUAL scale. That is it only measures the perceived service process performance and disregards expectation of the customers before their service encounters. The rationale for doing so is because:

a. Measuring the customers expected service level before the service is rendered is not always possible,
b. Measuring the expected service level after the service has been rendered is inaccurate as the customer's expectation by then has already been biased by the service rendered.

In this paper, the author uses SERVPERF. The researcher preferred SERVPERF as it provides a benchmark based on customer opinions on their experience using key service quality attributes identified in this study.

## 3. Sources of Data and its Analysis

The population of this study consists of customers using e-service system to pay their water bills to the Addis Ababa Water Supply and Sewerage Authority in its Arada sub-city branch of Addis Ababa. There were a total of 36,578 customers at the time of this study.

***Figure 1:*** *Arada sub-city*


*Source: Addis Ababa City administration*

**Sample Size**

As stated above, there are 36,578 customers at the time of the study in the branch. From these, the following are active customers who pay bills through electronic media (i.e. CBE Mobile banking, CBE Birr, and Internet banking). The researcher first identified the number of e-service users at the office for three consecutive months (November to January) to find an average number.

1. November 2021 = 4,689
2. December 2021 = 4,385
3. January 2022 = 4,737

Then the average population found to be 4600 using the following simple formula.

$$N = \frac{4,689 + 4,385 + 4,737}{3}$$

**N= 4, 600** where N stands for population

Out of this, the sample of 330 customers was selected based on convenience sampling. That means the customers were approached at the AWSSA branch office and were asked to fill in the questionnaire about the service quality and their perceptions on the spot.

**The Variables**

In order to measure users' satisfaction, data are collected using the five variables identified in the SERVPERF scale namely; Tangibility, Reliability, Responsibility, Assurance and Empathy. Each variable was broken down into sub components as indicated in Table 1 of this paper. The researcher customized the components to suit the topic under discussion for greater validity. One should also note that though e-service is a unique type of service delivery used to avoid physical contacts with service providers, the variables used in this study have a pervasive nature of touching upon other types of service modalities as well.

**Data Analysis**

The results of the questionnaires were analyzed using the Likert scale method and then entered into SPSS software. The Liker scale consists of five ordinal measures ranging from 1 to 5. Based on the frequency distribution, each response to each variable was analyzed.

## 4. Presentation and Analysis of the Data

This section begins with the users' responses on the level of e-service provided by the authority and followed by more related analysis.

***Table 2.*** *The Level of Electronic Service Performance*

| | | Frequency | Percent | Valid % | Cumulative % |
|---|---|---|---|---|---|
| Valid | at infant stage | 286 | 86.7 | 86.9 | 86.9 |
| | good | 25 | 7.6 | 7.6 | 94.5 |
| | very good | 12 | 3.6 | 3.6 | 98.2 |
| | very attractive | 6 | 1.8 | 1.8 | 100.0 |
| | Total | 329 | 99.7 | 100.0 | |
| Missing | | 1 | .3 | | |
| | Total | 330 | 100.0 | | |

Table 2 shows that 86.9% of the respondents rated the level as at infant stage, 7.6% of the respondents rated it as good. The rest, 3.6% and 1.8% categorized it as very good and attractive respectively. From the above statement the researcher can concluded that the E- service provision of the authority is at infant stage, which is unsatisfactory showing more is to be done by the authority.

**Types of Services Provided to Customers**

There are different services being provided by the authority.

***Table 3.*** *Type of Electronic Services Provided to Customers by AAWSA*

| Types of electronic services provided to customer by AAWSA | | | | |
|---|---|---|---|---|
| | | Frequency | Percent | Valid Percent |
| Valid | AAWSA's website provide information | 15 | 4.5 | 4.6 |
| | Billing transaction | 297 | 90.0 | 90.3 |
| | using AAWSA's services virtually | 13 | 3.9 | 4.0 |
| | GPS bill reading | 4 | 1.2 | 1.2 |
| | Total | 329 | 99.7 | 100.0 |
| Missing | | 1 | .3 | |
| | **Total** | 330 | 100.0 | |

90.3% of the respondents were using the service for billing transactions. 4.6%) were using AAWSA's website to access information and the rest were using the service for GPS bill reading. From Table 3 it can be concluded that even though AAWSA is providing different services, billing is the one which has been more importantly practiced followed by website information provision.

**The Analysis of Data on the Service Quality Dimensions and Customer Satisfaction**

A descriptive statistics is employed to analyze the service quality dimensions and their relation to customer satisfaction using mean and standard deviations. Mean score was calculated to show the average responses to each question that was included under each dimension. In this study the mean score between 4.51 to 5.00 is taken as excellent or very good, 3.51-4.50 considered good, 2.51-3.50 considered average or moderate, 1.51-2.50 fair and 1.00-1.50 is poor based on common sense.

**A. Tangibility**

***Table 4:*** *Tangibility Dimensions*

| Measurement Item | Mean | Std. Deviation |
|---|---|---|
| Does the system support any handy electronic equipment? | 3.2766 | 1.03863 |
| Is the service provided by electronics convenient for use? | 2.9574 | 1.01724 |
| Is the service including for every one's choice to serve at anywhere? | 2.9392 | 0.92852 |
| **Grand Mean** | **3.05** | |

Tangibility refers to physical facilities, equipment, and appearance of personnel also known as physical evidence. As shown from Table 4, the highest mean for this dimension comes from the first item, handy electronic equipment; with the mean score of 3.27, indicating the tangibility of E-service of AAWSA is good. The second highest mean comes from the second item; with the mean value of 2.95 indicating customers' satisfaction with is moderate. In general, the grand mean score for the tangibility dimension is 3.05.

### B. Reliability

***Table 5:*** *Reliability Dimensions*

| Measurement Item | Mean | Std. Deviation |
|---|---|---|
| Is the system error free while using? | 2.8997 | 1.28984 |
| Is the system reliable to use? | 3.1277 | 1.21052 |
| | 2.9392 | 0.92852 |
| **Grand Mean** | **3.0137** | |

Reliability refers the ability to perform the promised service dependably and accurately. In this case, the highest mean is scored from the second item i.e., whether the system is reliable to use or not with the mean score of 3.12, followed by the first item which is whether the system error free while using or not with a mean score of 2.89. In general, the grand mean score for the service reliability dimension is 3.01. Therefore, the researcher concludes that, in terms of reliability the level of satisfaction is moderate.

### C. Responsiveness

***Table 6:*** *Responsiveness Dimensions*

| Measurement Item | Mean | Std. Deviation |
|---|---|---|
| Employees are ready to support the customers when facing a problem while using the service alone? | 2.6535 | 1.12956 |
| Does the organization ready to solve a problem while facing the customers? | 2.9027 | 1.09166 |
| **Grand Mean** | **2.7781** | |

The grand mean of responsiveness dimension is 2.77 showing that customers' satisfaction of is not as much.

### D. Assurance

***Table 7:*** *Assurance Dimension*

| Measurement Item | Mean | Std. Deviation |
|---|---|---|
| Have no doubt when using the service alone in AAWSA? | 2.9210 | 1.23706 |
| I have no worry about system error ? | 3.1246 | 1.16594 |
| **Grand Mean** | **3.0228** | |

Assurance dimension refers to the knowledge and courtesy of employees and their ability to inspire trust and confidence including competence, credibility and security. The highest mean score is 3.12 regarding whether the system is error free or not.

The grand mean for assurance is 3.02 indicating that the quality of the service being provided by the organization is in moderate stage.

**E. Empathy**

***Table 8:*** *Empathy*

| Measurement Item | Mean | Std. Deviation |
|---|---|---|
| Employees announced to their customers when any change happens on the system | 2.9635 | 1.26583 |
| Employees effectively manage the complaints and problems of customers | 2.7386 | 0.87220 |
| **Grand Mean** | **2.85** | |

The highest mean for this dimension comes from the first item followed by the second item which is the effectiveness of employees on managing customers complaints and problems with the mean score of 2.73. The grand mean is also 2.85 which lies within an average or moderate range.

## Customers Satisfaction with Particular Reference to e-governance

In this section customer satisfaction is understood as the extent to which the needs of citizens are met using electronic means. In other words, customer satisfaction implies that citizens are able to access services using electronic means in a timely, cost-effective, and efficient manner compared with manual processes.

***Table 9:*** *Customers Satisfaction Needs*

| Measurement Item | Mean | Std. Deviation |
|---|---|---|
| I prefer to use electronic services rather than manual or paper-based services | 2.9574 | 1.24132 |
| I am satisfied with electronic services of the organization | 2.6869 | 1.14065 |
| **Grand Mean** | **2.82215** | |

As shown in Table 9, the highest mean comes from the customers' preference to use electronic services rather than paper-based services with a mean score of 2.95. This is followed by the general satisfaction of customers with the electronic services with a mean score of 2.68. As a conclusion, the grand mean score is 2.82 showing that the overall satisfaction is moderate.

Slow response from employees when encountering problems is blamed for poor performance in many instances. Moreover, lack of awareness from both sides (customers and the employees alike) to utilize electronic services is at lower stage. Some groups of customers are illiterate in the use of electronic services that require internet literacy. On the other hand, even for those who use the e-service, a weak internet infrastructure and swift connection is a hurdle.

Moreover, the electronic service platforms are supplied by the Commercial Bank and Ethio-telecom enterprises. AAWSA uses its website only to release information about its missions and services.

## Conclusion

The main objective of this study is to examine the effects of E-governance on customer's satisfaction in Addis Ababa Water and Sewerage Authority (AAWSA) by employing SERVPERF model with tangibility, reliability, responsiveness, assurance and empathy as service quality dimensions.

E-governance quality is measured by the realization of the potential advantages of the platform for the benefit of citizens in their interaction with government. E-governance service quality is therefore the degree to which an e-government enables citizens, businesses or agencies to achieve their governmental transactions.

The findings of this study indicate that the level of customer satisfaction with the service of Addis Ababa Water Supply and Sewerage authority is moderate in most service quality metrics used in the study.

Slow response from employees when customers encounter problems are blamed for poor performance in many instances. On the other hand, weak internet infrastructure and poor connection is a hurdle.

Moreover, awareness from both sides (customers and the employees alike) to utilize electronic services is at lower stage. Some groups of customers are illiterate in the use of electronic services that require internet literacy

Only a few thousand customers are using online billing among tens of thousands of AWSSA's customers in the branch. Many of them still prefer manual bill payment. Having the education and desire to access information is critical to e-government efficacy. Presumably, the higher the level of human development, the more likely citizens will be inclined to accept and use e-government services.

### References


Cronin, J.J., & Taylor, S.A.(1992). Measuring service quality: A reexamination and extension. Journal of Marketing, 56(3), 55-70

Mesifin, B. (2010). E-Government initiatives in Ethiopia. Ethiopian ICT Development Agency.

Ndou, V. (2004). E- Government for developing countries opportunity and challenges. The Electronic Journal of Information Systems in Developing Countries, 18(1),1-24..

Parasuraman, A., Berry, L., & Zeithaml, V.A.(1985). A conceptual model of service quality and its implication for future research(servqual). Journal of Marketing, (49), 41- 50.

Parasuraman, A., Zeithaml, V. A., & Berry, L. (1988). SERVQUAL: A multiple item scale for measuring consumer perceptions of service quality. Journal of Retailing, 64(1), 12-40.


### Author


**Jemal Abagissa, PhD**
Addis Ababa University
College of Business and Economics
Department of Public Administration and Development Management

jemal.abagissa@aau.edu.et