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Analysis of Citizens' Satisfaction (Acceptance & Needs) with E-Government Public Services

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Abstract: Purpose: *With the remarkable and rapid technological development, governments are developing services and quality of services by exploiting this technological development. The so-called e-government was launched to provide services to citizens electronically. The aim of this e-government is to provide a public benefit to society in general and to improve and develop public services by measuring the satisfaction of citizens and analysis of their needs. Thus, e-government is one of the main pillars to develop the general structure of public services through the use of technology and communications to improve the performance of government agencies and to provide high-quality services. This was an interesting research point, especially as the e-government in Palestine is under construction.* ***Research problem:*** *The problem of research is to analyze the needs of citizens in the public services of the e-government and measure their acceptance to adopt e-government, especially as the e-government in Palestine is under construction.* ***Methodology:*** *This research will be considered as an essential pillar of the success of the electronic as that in the construction of any product must take into account the needs of users in its construction. The research is based on several hypotheses revolving around analyzing the needs of citizens and the division of public services from the perspective of citizens and measuring the extent of acceptance of e-government and what factors directly affect the adoption of e-government.* ***Results:*** *The research attempts to answer the main questions of the research through the use of two global models: the Kano model, which analyzes the perception of citizens for public services and is divided into Must-be, One-dimension), Attractive and Indifferent Services. The UTAUT model measures citizens' acceptance of the idea of e-government through key independent factors: Performance Expectancy, Effort Expectancy, Social Influence and Environment Facilitating Conditions and their impact on the dependent factor: future trends and the intention to use e-government (Behavioral intention). This relationship is measured by intermediate factors: gender, age, scientific level and residential area.* ***Originality:*** *The researcher used the questionnaire method and collected information randomly. The elements of the questionnaire were formed through the study of literature on this subject and the collection of previous information and interviews of people with experience in this field.*

Keywords*:* Electronic Government (e-Government); public service

01: Introduction

1.1: Background of the Study

In recent years, the internet became one of the fundamental inventions with the largest impact on human society. There has never been any other technology in the history of humankind that has influenced and changed societies in such a short period. Substantial growth in such Information Communication Technology (ICT) investments is evident in both developed and developing countries (Okon'o, 2016). This development and progress in ICT enabled countries to employ the concept of e-government to enhance the relationship between the government on one hand, and citizens and private sector institutions on the other. This approach is meant to provide services and knowledge efficiently and effectively (Hijazi & Salameh, 2014).

When searching for "citizen satisfaction with e-government" on any internet engine, many results from around the world will appear, including articles, research, papers... etc. Results from the developed countries that have e-government working, however, will show that these countries are still trying to analyze and measure the citizens' satisfaction and needs. As for Palestine, the e-government system is still under construction. According to the Organization for Economic Co-operation and Development (OECD) report entitled 'The Case of e-government in the Palestinian Authority, that was published in 2011, a ministerial committee for e-government was established in 2005, and produced a first comprehensive e-government strategic plan. The strategic plan assured that e-government should provide a platform that 1) Empowers citizens to participate in government; 2) Connects citizens, the private, sector and institutions to drive economic growth and meet community challenges; and 3) Delivers real public value through citizen-centric government services".

With such, this promising project was is expected to provide a better life for the citizens, which is what PA aims at. An important part of e-government research has been on increasing the quality of services delivered to citizens based on their needs. In relation to these efforts, models of citizen satisfaction with e-government services need to be developed (Sheibani, 2012). For the aforementioned reasons, this research will build the start point for the e-government public services in Palestine and will aim to analyze the citizens' needs, perspective, quality and acceptance of the e-government system. Additionally, this research will attempt to find solutions and means to enhance the quality of public services, through using two international models built to measure citizens' satisfaction with e-government services, namely the Kano model or Kano diagram, along with the Unified Theory of Acceptance and Use of Technology "UTAUT". An explanation of both models is provided in the next chapter.

1.2: Paradigm of the Study

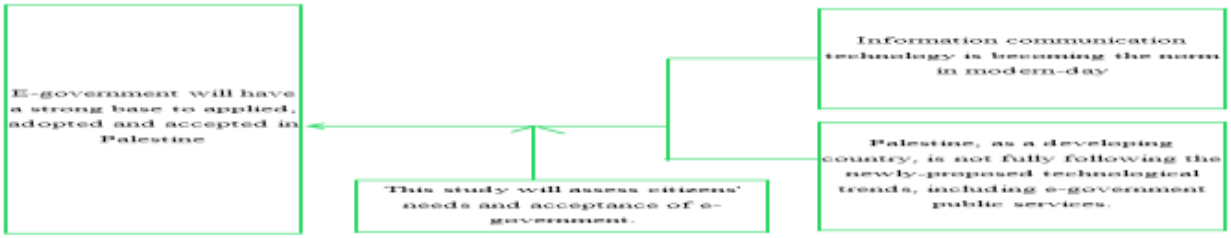

Figure 1: The paradigm of the study

1.3: Statement of the Problem

To accomplish the main objective of this research, answers to the following specific sub-problems and questions are sought:

1. What are the factors related to citizens' satisfaction with e-government public services when categorized as follows:
   1. Must-be quality
   2. Attractive quality
   3. One-dimensional quality
   4. Reverse quality
   5. Indifferent quality
2. What are the factors related to citizens' perspective quality with public services features that will lead to their satisfaction
3. Is there a relation between the social-demographic factors and the acceptance for the e-government when categorized as follows:
   1. Locality
   2. Education level
   3. Gender
   4. Age

1.4: Hypotheses

NO.	Hypothesis
1	Performance expectancy affects behavioral intention to use e-government public services. (gender, age, education and locality)
2	Effort expectancy affects behavioral intention to use e-Government public services. (gender, age, education and locality)
3	Social influence affects behavioral intention to use e-Government public services. (gender, age, education and locality)
4	Facilitating conditions affects behavioral intention to use e-Government public services. (gender, age, education and locality)
5	There are no significant differences in the citizens' perceptions of components of public services at the Palestinian e-government according to their characteristics like gender, age, education and locality

1.5: Theoretical Framework

This research mainly focuses on service quality, customer satisfaction and citizen acceptance for e-government. This section reviews the two models used to measure the service quality, customer satisfaction and citizen acceptance for e-government. The data for this research was obtained from different points of view. The first is the citizens' point of view to determine their needs and what is considered as attractive quality for them, and what is the 'must be quality' using the five dimensions of the Kano model. The second point of view is that from the citizens and ministries' employees, to know their acceptance for applying e-government using UTAUT Model. Based on the above, and to determine the perspective quality and satisfaction, the following two models are used:

1.5.1: Kano Model. The Kano model identifies five types of requirements that might affect customers' satisfaction (Hao, 2016). These requirements are explained later. This theoretical model finds a relation between these requirements, whether they were fulfilled by the purchased products or provided services, and assesses their influence on customer satisfaction. The information provided when applying the Kano model shall highlight the types of requirements in need of an enhancement to ensure customer satisfaction (Qiting, Uno, & Kubota, 2013). Satisfaction is largely linked to the concept of quality. Ensuring the satisfaction of customers depends on services or products' high levels of performance, which shall lead to customers' benefits (Hao, 2016). In other words, better performance leads to customer satisfaction. However, the relationship between customer satisfaction and service performance can be complicated.

In some cases, small performance improvements can greatly enhance customer satisfaction, while in other cases, a little improvement in customer satisfaction requires huge performance improvements. Therefore, it is important to understand this relationship well during the designing and development phases for any service to achieve maximum customer satisfaction (Hao, 2016). To have better knowledge and understanding of the relationship between service (product) performance and customer satisfaction level, Kano (1984), from Tokyo University of Science, developed a useful diagram in which he classified the needs of customers. The Kano model or Kano diagram, shown in figure 2 on the appendices (last section) is based on a theory proposed by Professor Kano, where he highlights the factors provided by a product or services that may affect to contribute to customer

satisfaction, which helps to understand the customers' perspectives and expectations of products' features. The model is graphically displayed as a combination of two scales: the A scale and the B scale. The A scale reflects the services' performance or functions and shows whether they meet the users' needs. The B scale indicates the users' reaction to the provided service: if they were satisfied delighted or disappointed, and whether their expectations were met. The users' requirements are hence divided into five categories, two of which are rare situations (Rotar & Kozar, 2017). These requirements are as follows:

1. Must-be
2. One-dimensional
3. Attractive
4. Indifferent requirements
5. Reverse requirements

1.5.1.1: Must be there (must be). This requirement refers to the essential things that should be available in each product. These requirements have to be there, yet their existence will not increase or ensure customer satisfaction, rather customers will act normally towards these requirements. However, if their requirements are not there, then complaints are inevitable. In the Kano model, these requirements are represented in the red curve at the bottom of Figure 2 (on the appendices section). These requirements can be an attribute, a function, or any basic feature that has to be part of and exist in the product or the service. The absence of these features, on the other hand, can lead to customer dissatisfaction and complaints, and can even cause loss of trust in the service provider. However, and as mentioned before, if these requirements are met, the customer will be neutral. Hence, these requirements should be there, and should not be negotiable for service providers.

1.5.1.2: Ability (performance). These factors are can also be described as 'the more the better. If the service provider fails to comply and fulfil, then customers will be disappointed, whereas providing these factors does not necessarily ensure their satisfaction, rather they will have an ordinary and moderate reaction. However, if these factors are abundantly provided, then customers are surely satisfied. The better the performance of these attributes and factors, the higher the level of customer satisfaction. Conversely, the poor performance of these attributes decreases customer satisfaction.

1.5.1.3: Delighters. Delighter requirements are meant to satisfy customers more. If delighters are not provided, customers will not be disappointed, but if these requirements are given, then customers will be very satisfied. For example: giving a high-end portable sound system as a gift when buying a laptop will make the customer very satisfied. It should be noted, however, that this requirement will shift over time and as the level of competition increases; the delighter of today could be the performance of tomorrow and a Must-Be next year.

1.5.1.4: Indifferent requirements (rare situation). With these requirements, the customers are neutral regardless of whether they get them or do not get them, or whether these requirements are not fulfilled or completely fulfilled**.**

1.5.1.5: Reverse requirements (rare situation). Customers react adversely to these requirements, where fulfilling them will cause dissatisfaction and not fulfilling them will make the customer very satisfied. There are several reasons this can happen, one of the common ones is the customer misinterpreted the need in the survey you designed. The first three of the aforementioned categories should be taken into consideration when defining the product or service requirements and design. When designing a new product or service, the Must-Be requirements have to exist and be met; omitting these requirements is not an option. As for the performance requirements, it is essential when the product or service is competing with other similar products or services, as this is where the features and properties of the product or service are identified, ensuring that this particular product or service is attractive and competitive in the market.

02: Critical Review of Relevant Literature

2.1: E-Government

Governments nowadays use different ways and methods to provide their services. A well-performing e-government system requires that all citizens have an access to information technology solutions, where information technologies are used to create and deliver the services. This approach is useful and has an effective impact on businesses as well as the citizens.

The innovation of e-government has moved the global society to an electronic system. In this regard, Bashar *et al.* (2011) argue that the traditional public sector is a reactionary and costly system that uses a lot of paperwork; whereas e-services create an interactive platform where the citizens can easily engage.

The duty of local governments is to perform their tasks and provide their services to the communities of the highest quality. To allow the proper implementation and execution of these tasks, local governments need to ensure implementing a monitoring and evaluation scheme, taking into consideration the citizens' perspectives and concerns (Bambang *et al*., 2017).

The expansion of ICT is affecting the functions and roles of governments, and its use in governmental services is becoming a need and a necessity to fit into the digital economy phenomenon (AL-Rababah & Abu-Shanab, 2010).

According to Fan and Yang (2015), the main reason governments are adapting e-government public services around the world is based on the management theory that argues that governments should act as suppliers of services, whereas citizens and firms receive these services (Abdelsalam, 2016). Given the rapid improvements happening on information technology, governments hence dedicated their efforts towards empowering the citizens and firms to have higher and more efficient access to the offered services (Abdelsalam, 2016). According to Abdelsalam (2016), e-government can involve four types of stakeholders, namely the governments, citizens, businesses, and employees. The relationship between these stakeholders can be in five contexts:

1. Government-to-Citizen (G2C)
2. Government-to-Business (G2B)
3. Government-to-Employee (G2E)
4. Government-to-Government (G2G)
5. Internal Efficiency and Effectiveness of e-Government systems (IEE)

2.2: E-Government in Palestine

As mentioned earlier, some obstacles hindered the Palestinian Authority (PA) from implementing the overarching e-government strategy, regardless of the fact that there have been strong foundations laid towards the establishment of successful e-government in Palestine (Gaza, 2015). These obstacles include not only the lack of financial means but also the continued Israeli occupation, complex political environment, in addition to the lack of communication between and within the concerned ministries.

2.3: Public Services

Public services are essential in building a strong and civilized society. Under certain circumstances, public services can take a central role in the formation of public structural and collective identities (Newman, 2009). This explains the main difference between private and public services since citizens do not get benefits from private services as they do from public services. However, according to Rafia (2009), public service delivery is considered week, slow and unresponsive in developing countries as it does not comply with the citizens' preferences and priorities and at times does not meet the expected quality. Therefore, governments are expected to better understand citizens' needs and give attention to their priorities when delivering public services. This will help increase and enhance the trust between the citizens and government (Hartley, 2005).

When adopting e-government, governments should consider applying the broader context of the system, and not only simple services. E-government is the basis in improving the efficiency of delivering public services to the citizens, businesses, and agencies, and the access to information at lower costs can enhance the interconnections between the government and their citizens (Okong'o, 2016). On the other hand, Holzer (2015) argues that the use of e-government by citizens will create a better role in governmental functions due to the combination of ICTs and citizen participation, as through this system, public services are delivered more efficiently, easily and more quickly to citizens, enterprises and organizations (Europa, 2018).

2.4: Service Quality

Service quality is recognized as one of the main factors behind the sustainability of a company, or a provider, and one of its driving forces (Filipe, Álvaro, & Manuel, 2015). It is the key tool for measuring the success of the provided service, as it is the most important requirement for the user. This section tries to provide evidence for the importance of analyzing the citizens' needs and expectations to enhance the service quality, which will lead to their satisfaction. To maintain the quality of any service, the needs and expectations of customers should be determined, as they are the most important factors that influence the customer perception of quality and loyalty. Likewise, and due to the aforementioned reasons, service quality is a key requirement for implementing and adopting the e-government system (Hien, 2014). Quality of services is determined by the level of quality expected by the customer. If the expected level of quality is consistent with the perceived level of service, the service is satisfactory. However, if the expected quality is greater than the perceived service, then it will not satisfy the customer, and if the expected quality is less than the perceived quality, it will satisfy the customer. Both the expectation and the perception of the service quality are subject to personal considerations of the customer, and therefore the quality issue is a relative matter (Biljana & Jusuf, 2011).

Adding to that, service quality helps the firm, or the provider, to be distinctive and gain a competitive advantage by continuously improving (Yunan, 2016). Thus, the need to evaluate quality can ultimately be perceived as a success factor to the service provider. In the case of e-government, evaluating the quality of the provided services is particularly significant as it will lead to providing efficient management of government information, and giving better and transparent services to the community (Hien, 2014). In the service field, the customer usually demands the highest and finest quality, while the service provider has to keep improving the service quality to meet the customers' needs, by upgrading the operational process, identifying problems quickly and measuring customer satisfaction (Hien, 2014). For this reason, determining the expected quality starts from the customers' needs. In e-government public services, citizens are the service users. They are the ones who evaluate how the service should be (Filipe, Álvaro, & Manuel, 2015). Yet since human nature is demanding, and since technological development is rapid, analyzing the citizens' needs and expectations is the first purpose of this.

2.5: Citizens Satisfaction

Many studies on e-government focused on giving attention to citizen-centric services and self-service delivery options, where the citizen's role in the service itself is crucial (Chatfield & Mutared, 2013). For that, attention is given to citizen satisfaction with self-services in e-government. The success of organizations depends on the relation between the organization and its customers since customer satisfaction is the main factor for the organization's success. Citizens' satisfaction with public service delivery can hence be determined by knowing how much the citizens are satisfied with public service quality (Peng, Almaktary, & Karmoshi, 2017).

The European Commission (2013), declared in a press release 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". Previous studies on Information Systems declared that service quality can be a key term for determining the success of electronic services (DeLone & McLean, 2008; Berry & Parasuraman, 1996). Therefore, examining the quality of e-services is important to increase people's adoption and acceptance of e-government services (Wallang, 2018).

2.6: Must-Be Quality and Attractive Quality Role in Customer Satisfaction

To answer the question of how can a company consistently satisfy its customers, Kano *et al*. (1984) introduced the theory of attractive quality to better explain the roles that different quality attributes play for customers. Kano Model or Kano diagram explained in section 1.9.1, presents the factors and product attributes, features or requirements that affect customer satisfaction, where satisfaction is related to satisfying the hidden and clear customer needs in the set of product attributes. This is also confirmed by Tontini *et al*. (2013), who said that a key challenge to success and increase of interest in a particular product is identifying the relation between attributes performance and customer satisfaction. As for e-government, previous studies tried to determine maturity models to rank e-government portals and serve as a guide to help agencies enhance the quality of e-government portals (Fath-Allah *et al*., 2014). Some studies identified 17 models and others identified 25 models, and almost all of them have a lot of common features and similarities. Most models identified three main stages: presence, communication, and integration (Almuftah *et al*., 2016). Other models with also common features identified four stages of different names but similar content. Those stages are presence, interaction, transaction and integration (Fath-Allah *et al*., 2014). According to Fath-Allah *et al*. (2014), the most important features in these maturity models include the following: Customer centricity, interoperability, payment, e—participation, and personalization.

2.7: Acceptance of e-Government:

Several developing countries attempted to utilize models of e-government similar to those of developed countries thinking it would yield the same benefits and results. However, Heeks (2003) realized that several developing countries failed at installing e-government systems given the large gap between the users and the platform, due to weak adoption of services by the users. In reality, services are designed to meet the needs of each citizen (Deloitte & Touche, 2000), hence it is necessary to understand what is attractive to citizens, to be included in e-government (Susanto, 2013). According to Susanto (2013), the psychological drivers that determine the actions and behaviours of individuals interested in using e-government services are the use of attitude, mentality, social-demographics factors, expected benefits and the service provider, which is the government in the case of e-government.

2.7.1: UTAUT construct. UTAUT is one of the latest developments in the field of general technology acceptance models. Like earlier acceptance and adoption models, it aims to explain the user intentions to use an Information System (IS) and to further the usage behaviour. Venkatesh et al. (2003) created this synthesized model to present a complete picture of the acceptance process, overcoming all that previous individual models were able to do (Alshehri & Rayed, 2013). Since UTAUT integrates all preceding models, it has the power to measure technology adoption better than the other models, which explain why it has been adopted in most of the recent researches and studies on e-government as it contains most of the variables that could explain the acceptance in e-government (Mansoori, 2017). As mentioned earlier, the UTAUT Model is based on investigating Performance Expectancy, Effort Expectancy, Social Influence and Facilitating Conditions. This Model has been amended to fit the e-government sector, and hence the following subsections explain how the UTAUT factors will influence e-government.

2.7.1.1: Performance expectancy. Performance Expectancy "is the degree to which an individual believes that using the system will help him or her to attain gains in job performance" (Venkatesh *et al*., 2003). Many researchers mentioned that performance expectancy is the predictor of intention to use e-government services (Mansoori, 2017). The performance expectancy used in previous models was perceived as usefulness from the TAM and the combined TAM-TPB model, job-fit from the MPCU model, outcome expectancy from the SCT model, extrinsic motivation from the MM model, and relative advantage from the IDT (DOI) model (Venkatesh *et al*., 2003; Mansoori, 2017; Ying-Hsun & Seng-cho. 2006).

2.7.1.2 Effort expectancy. Effort Expectancy "is the degree of ease associated with the use of the system" (Venkatesh et al., 2003). This factor plays a key role in facilitating the acceptance of technology. The effort expectancy used in the previous models was perceived ease of use from TAM/TAM2 Models, complexity from the MPCU Model, and ease of use from the IDT (DOI) model (Venkatesh *et al*., 2003; Mansoori, 2017).

2.7.1.3 Social influence. Social Influence is the impact of the surrounding people, or the 'important others' on the individual to make him/her believe he or she should use the new system or service (Venkatesh et al., 2003). It is one of the essential factors to persuade and convince people to accept and use new technology (Mansoori, 2017). The social influence used in the previous models as the subjective norm from the TRA, TAM2, TPB/DTPB, and C-TAM-TPB Models, social factors from the MPCU Model, and image from the IDT (DOI) model (Venkatesh *et al*., 2003; Mansoori, 2017; Ying-Hsun & Seng-cho. 2006).

2.7.1.4: Facilitating conditions. Facilitating conditions reflect the degree to which users perceive the provided infrastructure and facilities, whether organizational and technical and their efficiency to support the system. As for e-government, and according to Mansoori (2017), facilitating conditions implies' the citizens' expectation of having a good infrastructure, active helpdesk and efficient technical team that support the applied e-government system. In previous models, such factors are perceived as behavioural control in the TPB/DTPB and C-TAM-TPB Models, as facilitating conditions in the MPCU Model, and compatibility

factors in the IDT (DOI) model. All in all, these conditions are important as they influence, guide and control the users' behaviours (Venkatesh *et al*., 2003; Mansoori, 2017; Ying-Hsun, & Seng-cho, 2006).

03: Research Methodology

3.1: Research Design

This research employed a combined quantitative and qualitative research method, including questionnaires, interviews, and field visits that led to accessing direct and accurate information, reflecting the real situation.

3.2: Research Models

To identify the citizens' needs; the researcher used the Kano Model to classify the public services to be provided by the Palestinian e-government. For this purpose, some previous research literature was reviewed to clarify these characteristics. In addition to the literature review, this study used the quantitative approach to test the quality critical empirically. These features or characteristics are categorized according to Kano Model (Must Be, Performance and Delighters), as shown in Figure 4 of appendix VI.

On the other hand, to measure the citizens' acceptance of public services in e-government, the researcher used the UTAUT Model that measures the four dimensions (performance expectancy, effort expectancy, social influence and facilitating conditions). The first three dimensions are direct determinants of usage intention and behaviour, and the fourth is a direct determinant of user behaviour (Venkatesh *et al*., 2003). Gender, age, education level, and locality are expected to moderate the impact of the four key constructs on usage intention and behaviour.

Since the e-government in PA is still under construction and has not launched yet, the model should be regularly modified and revised to be made fit for different applications in the different contexts (Venkatesh *et al*., 2003). This research aimed to consider behavioural intention as the indicator to definite direction on the adoption of e-government. As mentioned in previous studies the behavioural intentions will have a positive correlation and direct influence on usage behaviour (Venkatesh *et al*., 2003; Alshehri, Drew, & AlGhamdi, 2013). The relationship between the aforementioned factors is shown in Figure 5 of appendix VII.

3.3: Research Variables

Citizens' satisfaction is considered as a dependent variable that is influenced by the citizens' needs and acceptance, and it will determine their needs through the must be, performance, attractive, reverse and indifferent factors. It is also dependent on the citizens' acceptance that is measured by the four dimensions: performance expectancy, effort expectancy, social influence and facilitating conditions, which consequently influence the behaviour intention. All these dimensions are also affected in one way or another by the moderate factors of gender, age, education level, and locality. All the above-mentioned variables are represented in Figure 6 of appendix VIII.

To test the hypothesis of the research, a new questionnaire is built using the two models, the Kano Model and UTAUT Model. The first part of the questionnaire is based on the Kano Model and is used to analyze the needs and categorize the features. The second part of the questionnaire is based on the UTAUT Model to reflect the relation between the four moderate factors (age, gender, education level and locality) on the four constraints (Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI) and Facilitating Conditions (FC)), as shown in Figure 5 on the appendix section at the end of this paper.

3.4: Population, Sample Size and Sampling Technique

One of the critical tasks for a survey was to obtain a representative sample of citizens (Hao, 2016). According to the Palestinian Central Bureau of Statistics (PCBS), the population of Palestine (the West Bank and Gaza Strip) in the year 2019 is "4,976,684", but for the political status, the Gaza strip is not included in the research. Thus, the population targeted in the research is that in the West Bank, which adds up to "2,986,714" of the total population. However, there is a portion of the population that cannot legally use the e-government public services as they are under the age of 18 years old. Therefore, the research population is 1,711,334 persons who can legally use the e-government public services and are older than 18 years old. To determine the sample size, the following formula, adopted from Daniel WW (1999) is used. The total sample size will be 335 citizens plus the initial 50 for testing the survey.

$n = N*X / (X + N - 1)$, where:

- $X = Z\alpha/22$ -*p*(1-p) / MOE2, and
- n= Sample Size.
- ** $Z\alpha/2$ is the critical value of the Normal distribution at $\alpha/2$ (e.g. for a confidence level of 95%, α is 0.05 and the critical value is 1.96),
- MOE is the margin of error,
- P is the sample proportion,
- N is the population size.

According to the sample size equation, the researcher distributed 400 surveys randomly by hardcopy. And the return survey was 201 with a response rate of 52%

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3.5: Data Collection

The data used in this research is based on the basic data obtained through the questionnaires that were built and designed for the mixed models; the Kano model to measure the citizens' perspective on quality in public services features, and the UTAUT model to measure the citizens' acceptance of e-government. The data was collected randomly "sample random" through the survey was given to the citizens by hardcopy.

04: Research Results, Data Analysis, and Interpretation

4.1: Data Preparation of Kano Model

The evaluation table of the combination questions shown in Figure 7 indicates the citizens' perception. If, for example, the results produced a category A attribute (Attractive), this means that the citizen or customer expects an attractive service, which is hence a requirement that the service provides has to offer to ensure the satisfaction of this customer (Qiting, Uno, & Kubota, 2011). If, on the other hand, combining the answers produced category I (Indifferent), this means that it doesn't matter whether a specific service feature is present or not. The customer is neutral and does not think this feature is adding value to the service, and his satisfaction is not strongly affected by it (Zhu *et al*., 2010).

The Q (Questionable) result, if produced, means that there was something wrong in phrasing the question or that it was misunderstood. If category R (Reverse) is produced in the evaluation table, this means that this particular service feature is strongly unwanted and undesired. Having categories Q and R in the evaluation table indicate a problem with the question or the data gathering (Clausing, 1995). In addition to the Kano questionnaire, it may be helpful to determine the relative importance of each product (service) criteria, showing the hierarchy of what customers, or citizens in the case of this research, need more or think of higher importance.

4.1.1: Customer satisfaction coefficients (CSCs). There are two types of coefficients to measure customer satisfaction and can be calculated using the data summarized in Table 17. Those are the enhanced Satisfaction Coefficient (SC) and the reduced Dissatisfaction Coefficient (DC). They can be measured using the below equations:

$$SC = \frac{A + O}{A + O + M + I}$$

$$DC = \frac{O + M}{A + O + M + I}$$

4.2: Result of Kano Model

Using Kano's evaluation table of the respondents' answers were summarized and calculated see (appendix 3). The result classified the features into six categories using the template table above. And the result was as shown in table 3 of appendix IX. From table 16 we can know the quality categories for each feature but in case a tie occurs, Bhavsar (2017) advise to take the following rule into the consideration in case a tie occurs in the feature-wise; M>O>A>I.

4.2.1: Attractive quality element. This kind of feature never brings dissatisfaction to users. But with the respondents' judgment, none of the features is classified distinctively as 'Attractive'. However, if we look at the number of times the attractive is repeated and it is close to the indifferent, this characteristic can be considered as attractive as A>I. so we can consider "traffic and warning crises feature" as an "Attractive".

4.2.2: Must be a quality element. Normally, users believe that this type of feature and service has to be available and should be working properly. Because they believe that such features are basic features and must be offered to them. One can consider them as necessary inbuilt features. In absence of such features or inefficient functioning of them might be the cause of high-level customer's dissatisfaction. Regarding the result 8 features described as "M" namely; "Using Single window", "Availability for 24 hours / 7 days a week", "Linking all the services", "Alert mechanism", "Information about individual financial fees", "Submitted through limited windows", "Frequent update" and "Unify the entry with special code".

4.2.3: One-dimensional quality element. The features which have been classified as one-dimensional quality elements might bring a high level of customer's satisfaction when exist. Again this can bring a high level of customer's dissatisfaction with their unavailability them. Regarding the result "9" features described as "O" namely; "Text Message System", "Centralized call centre", "E-payment mechanism", "to follow up on applications", "Personal Profile", "Electronic copies of services", "Smart mobile application", "available any time anywhere" and "Access without additional fees".

4.2.4: Indifferent quality element. It has been found that users do not bother about the availability of some of the features. These features are classified as 'Indifferent' normally they do not become the cause of a high level of customer's satisfaction when they are available. Even more, the unavailability of such a feature does not lead to customer's dissatisfaction. Regarding the result, "3" features are described as "I" namely; "Support multi-languages", "Mail service" and "Provide printing features". This category could be done but with the lowest priority.

4.2.5 Customer satisfaction coefficients. SC and DC answer questions like; "*at what extent customer's satisfaction can be influenced by any particular feature/ service?"* Bhavsar (2017). This might help to decide the quality of the service to satisfy the user. If the value of SC falls closer to '1' then it indicates the high-level user's satisfaction. At the same time, the value of DC falls

near '-1' then a high level of user's dissatisfaction can be associated with the absence/ poor quality of that particular feature of e-government. The values of these coefficients are calculated for listed features of e-government; it's shown in appendix X.

4.3: Profile Sample

The respondents of the questionnaire were 201 which 53.7% where male and 46.3% female, they are distributed among age as 25.4% between (18-24), 25.4% (25-31), 26.9% (32-38), 14.4% (39-44) and 8% (45 and more). The education level was categorized as PhD which had 3% of respondents, Master degree 20.4%, Bachelor degree 61.2%, Diploma 8.5% and high school and less 7%. And the work sector is divided into 5 categories; public sector with 55.2%, private sector 12.4%, freelancing 7%, housewife 2% and other sectors 23.4%. Also, the locality where urban 48.3%, rural 43.3% and camp 8.5%.

4.4: Result of UTAUT Model

The Statistical Package for the Social Sciences (SPSS) was used to analyze the UTAUT model to know the behavior intention toward acceptance of using e-government. As detailed in the previous chapter this model includes one dependent variable "Behavior intention" and four independent variables "Performance Expectancy, Effort Expectancy, social influence and Facilitating conditions" which influence the behavior intention among the four moderate factors "Gender, Age, Education Level and Locality". In order to test the relation between the variables (dependents' and independents) the Spearman's correlation test was conducted and the result signed to significant correlation between the variables which the Facilitating conditions have the highest coefficient than the performance expectancy, then the effort expectancy and then the social influence.

Table 1: Correlation of variables

Correlation of variables				
		Behavior		
		Correlation Coefficient	Sig. (2-tailed)	N
Spearman's rho	Performance	.507**	.000	201
	Effort	.376**	.000	201
	Social	.293**	.000	201
	Facilities	.625**	.000	201
**. Correlation is significant at the 0.01 level (2-tailed).				

The multi- regression used to analyze the model, first regression was done to analyze the dependents variable with the independents' variables without the moderate factors, the result as shown in table 19 show that R-square is0.566, that's means, the change in the independent factor "behavior intention" influenced by the four dependent factors "performance expectancy, effort expectancy, social influence and Facilitating conditions". Table 2 below shows that there is a significant relation between the variables since the p-value is less than .05.

Table 2: Model summary

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.752[a]	.566	.557	.46745

Table 3: Regression between dependent and independent variables

Regression between dependent and independent variables								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.221	.274		.806	.421		
	Performance	.390	.074	.313	5.232	.000	.630	1.587
	Effort	.251	.066	.218	3.823	.000	.694	1.441
	Social	-.175	.065	-.171	-2.695	.008	.560	1.784
	Facilities	.516	.060	.535	8.642	.000	.590	1.695

In order to test the model with its all instruments (dependents, independents, and moderators) factors, we did a regression with interaction between the independents and moderators factors which categories as dummy variable. The R- square was .810 as seen in table 8 below. And this explain the change in the behavior intention comes from the independent and moderate factors.

Table 4: Regression for all instruments model summary

Regression for all instruments Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.900[a]	.810	.731	.36465

This analyses result give the significant relation between the variables and moderators.

4.4.1: Significant factors and moderators. The performance expectancy had a significant effect on behavior intention and the relationship would be moderated among education level through (master degree, bachelor degree and diploma degree). See appendix (5). The effort expectancy had a significant effect on behavior intention and the relationship would be moderated among locality. See appendix (5). The Facilitating conditions had a significant effect on behavior intention and the relationship would be moderated among age (25-31), an education level (diploma) and locality. See appendix (5). Education level, (Master Degree) and age, (25-31) years range, were found to be a significant moderator in terms of influencing the behavior intention to use e-government public services. But the other subcategories and ranges in the education level (PhD, Bachelor, Diploma and high school and less) are not significant. Also age ((18-24), 32-38), (39-44) and (45 and mode)) are not significant. See appendix (5). Also, the social influence among the education level and locality have a positive effect on behavior intention.

4.4.2: Non-significant factors and moderators. The social influence did not have a significant effect on behavior intention to use e-government. Gender and locality, also are insignificant as moderating factors on behavior intention.

4.4.3: Normality test. To use regression test the data should be normally distributed, we did a normality test for the error. So, that the error should be normally distributed and have equal variance regardless of the value of the independents' variables. The table below shows that the p-value is more than 0.05.

Table 5: Tests of normality

Tests of Normality						
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Standardized Residual	.048	197	.200[*]	.989	197	.130

4.4.4: The relation between the main variable and moderators' factors. In order to observe the differences between the variables among the moderators' factors, Kruskal Wallis's test was used because the data was not normal. The result of this test will lead to which variable is affected by which moderate factor.

4.4.4.1: Gender. As shown in Table 6 below, there is a significant difference in the Facilitating conditions and behavior intention among the gender since the p-value is less than 0.05.

Table 6: Gender with variables

Gender with variables				
Gender	Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)
Performance	4211.000	8582.000	-2.009	.045
Effort	4584.500	10470.500	-1.080	.280
Social	3940.000	8311.000	-2.662	.008
Facilities	3634.000	8005.000	-3.408	.001
Behavior	2872.500	7243.500	-5.448	.000

4.4.4.2: Age group. As shown in table 24, there is no significant difference in the variables among age groups since the p-value is more than 0.05.

Table 7: Age with variables

Age with variables					
Age	Performance	Effort	Social	Facilities	Behavior
Chi-Square	7.919	3.533	9.005	4.513	.830
df	4	4	4	4	4
Asymp. Sig.	.095	.473	.061	.341	.934

4.4.4.3: Education level. As shown in table 8, there is a significant difference in the performance expectancy and effort expectancy among the education level, since the p-value is less than 0.05.

Table 8: Education level with variables

Education level with variables					
Education	Performance	Effort	Social	Facilities	Behavior
Chi-Square	15.472	20.540	7.513	1.756	2.267
df	4	4	4	4	4
Asymp. Sig.	.004	.000	.111	.780	.687

4.4.4.4: Locality. As shown in table 9, there is a significant difference in the performance expectancy and effort expectancy among the locality, since the p-value is less than 0.05.

Table 1: Locality with variables

Locality with variables					
Locality	Performance	Effort	Social	Facilities	Behavior
Chi-Square	12.033	13.584	1.540	1.808	3.366
df	2	2	2	2	2
Asymp. Sig.	.002	.001	.463	.405	.186

4.5: Hypothesis Test

After this analysis of the data obtained from the distributed surveys, the result will be used to examine the hypothesis.

Table 10: Hypothesis Results

NO.		Hypothesis	Results	
			Accept	Reject
1		**Performance expectancy affects behavioural intention to use e-government public services.**		
	A	Gender differences have a moderate impact on the relationship between performance expectancy and behavioral intention.		√
	B	Age has a moderate impact on the relationship between performance expectancy and behavioral intention.		√
	C	Locality has a moderate impact on the relationship between performance expectancy and behavioral intention		√
	D	Education level has a moderate impact on the relationship between performance expectancy and behavioral intention.	√	
2		**Effort expectancy affects behavioral intention to use e-Government public services.**		
	A	Gender differences have a moderate impact on the relationship between effort expectancy and behavioral intention.		√
	B	Age has a moderate impact on the relationship between effort expectancy and behavioral intention.		√
	C	Locality has a moderate impact on the relationship between effort expectancy and behavioral intention.	√	
	D	Education level has a moderate impact on the relationship between effort expectancy and behavioral intention.		√
3		**Social influence affects behavioral intention to use e-Government public services.**		
	A	Gender differences have a moderate impact on the relationship between social influence and behavioral intention.		√
	B	Age has a moderate impact on the relationship between social influence and behavioral intention.		√
	C	Locality has a moderate impact on the relationship between social influence and behavioral intention.	√	
	D	Education level has a moderate impact on the relationship between social influence and behavioral intention.	√	
4		**Facilitating conditions affect behavioral intention to use e-Government public services.**		
	A	Gender differences have a moderate impact on the relationship between facilitating conditions and behavioral intention.		√
	B	Age has a moderate impact on the relationship between facilitating conditions and behavioral intention.	√	
	C	Locality has a moderate impact on the relationship between facilitating conditions and behavioral intention.	√	
	D	Education level has a moderate impact on the relationship between facilitating conditions and behavioral intention.	√	

5		**There are no significant differences in the citizens' perceptions of components of public services at the Palestinian e-government according to their characteristics like gender, age, education and locality.**		
	A	Mann-Whitney U test: there is no significant relationship between the citizens' perceptions of components of e-government public services with gender since the p-value is more than 0.05.	√	
	B	Kruskal Wallis Test: there is no significant relationship between the citizens' perceptions of components with age since the p-value is more than 0.05.	√	
	C	Kruskal Wallis Test: there is a significant relationship between the citizens' perceptions of components with education level since the p-value is less than 0.05.		√
	D	Kruskal Wallis Test: there is no significant relationship between the citizens' perceptions of components with locality since the p-value is more than 0.05.	√	

05: Conclusion and Recommendations

5.1 Finding and Conclusions

Regarding research questions, and after analysing the data obtained from the distributed surveys, the answers of the question can be summarized as follow:

Question one: What are the factors related to citizens' satisfaction with e-government public services when categorized as follows: Must-be quality, Attractive quality, One-dimensional quality, Reverse quality, Indifferent quality? The e-government features collected in the survey which was adopted from literature reviews was tested to be modified regarding Kano model quality elements. And these categories have been affected by demographic factors namely "Gender, Age, Education level and Locality". This question was tested through the hypothesis "H5", and the result points out that gender, age and locality does not affect the citizens' perception of e-government public services. But the education level is making deference.

Question two: What are the factors related to citizens' perspective quality with public services features that will lead to their satisfaction? This question was answered by analyzing citizens need and acceptance using the Kano model and UTAUT model. Here the result can summarize as follow: all e-government features were categorized as must be "M" and One-Dimensional "O" should be included in e-government services from the beginning to satisfy the citizens. Also, as a result of the UTAUT model, the Performance expectancy of the e-government and facilities conditions needed to use the e-government are the significant variables that affect the behavioral intention toward using or adopting the e-government, and these moderated through the demographic factors.

Question three: Is there a relation between the social-demographic factors and the acceptance for the e-government when categorized as follows: Locality, Education level, Gender, Age?" This question was answered through testing the relation between the main variable and moderators' factors in chapter four. And the result shows that all demographic factors included in this research do not have a significant relationship with behavioral intention to use e-government public services except the significant gender. But when taking the demographic factors as moderator factors through the UTAUT model the age and education level have a direct impact on behavioral intention. Also, the other factors have an impact through the independent factors.

In the conclusion, the features "Using Single window", "Availability for 24 hours / 7 days a week", "Linking all the services", "Alert mechanism", "Information about individual financial fees", "Submitted through limited windows", "Frequent update" and "Unify the entry with special code" which categorized as must-be "M" and "Text Message System", "Centralized call centre", "E-payment mechanism", "to follow up on applications", "Personal Profile", "Electronic copies of services", "Smart mobile application", "available any time anywhere" and "Access without additional fees" which categorized One-dimensional "O" should be obtained in the e-government public services to meet citizens need the recording to Kano model result. On the other hand, e-government performance and facilitating conditions are key factors that affect the adoption of e-government.

5.2: Recommendations

The government need to pay more attention to e-government public services especially that the e-government in Palestine is still under construction by identifying which features should be built in the first phase and what features will rise, citizens, satisfaction. Also, give attention to the demographic factors and where the impact of these factors is making differences on accepting the e-government?

5.2.1: Recommendation related to e-government features. To enhance a better quality of public services delivered to citizens based on their needs, this research gives the government a full analysis of e-government proposed features categorized according to citizens quality perceptions. The result of the research shows that "17" of "21" features of public services were listed in the survey are categorized as Must-be and One-Dimensional, and these two quality elements are the most important dimensions according to the Kano model. And these are the two categories if exist will lead to citizens satisfaction. For that, I recommend the

PA government consider these features in building the e-government. Besides that, the features which were categorized as Indifferent or Attractive can be as a second features phase.

5.2.2: Recommendation related to performance expectancy. As a result, when the e-government has an efficient performance this will increase citizens' behavioral intention to use the e-government. All instruments used in performance expectancy in the survey had a mean with "4" of the Likert scale regarding all demographic factors, see appendix 7 and this lead to acceptance. Here the government should pay attention to what increase e-government performance such as e-payment mechanism, less waiting time, freedom from fees, or Availability for 24 hours / 7 days a week.

5.2.3: Recommendation related to effort expectancy. All citizens should be provided with accessible, transparent and user-friendly e-Government services, and how a citizen can access the e-government such as using a single window, follow up on applications, linking all the services, unify the entry with special code and other features listed. Complexity should be avoided and simplicity should be sought in the design of e-Government services.

5.2.4: Recommendation related to social influence. Social influence does not have a significant impact on behavioral intention to adopt the e-government, which relates to many reasons, maybe because the citizens in PA did not use the government yet. And after using the e-government public services the social influence will differ as the word of mouth could affect them.

5.2.5: Recommendation related to facilitating conditions. The facilitating conditions have the highest impact on behavioral intention to adopt e-government, and that could be it's the part which belongs to citizens themselves, as if they have the resources necessary to use e-government services, the knowledge necessary to use e-Government services and if the e-government services are compatible with other technologies they use, for that when the e-government was user friendly and does not need special resources it will be adopted. The Palestinian Ministry of Telecommunication and Information Technology (MTIT) is currently working on a new project for the e-government, in which it is aiming to include all public services. As this research analyzed citizens' satisfaction and needs, the obtained results will feed into the designing the system in a manner that shall ensure and measure the citizens' acceptance for e-government. This approach shall also help to identify the obstacles and determinants, such as emerging from the culture, or resistance from people with limited computer skills, which will eventually allow handling these obstacles efficiently. This research clearly defines the important aspects of public services, then determines the citizens' perspective of quality in public services, and measures the citizens' acceptance for e-government using the case of Palestine.

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Appendices

Appendix I: Research paradigm

Appendix II: Research hypotheses

Appendix III: Graph of Kano's model

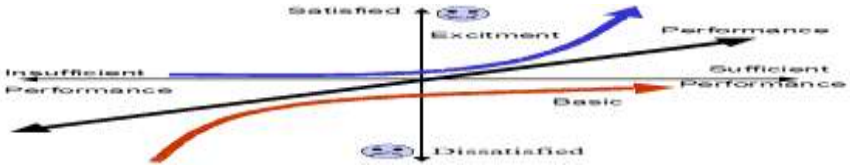

Figure 2: Graph of Kano's model (Kano *et al*., 1984)

Appendix IV: The unified theory of acceptance and use of technology

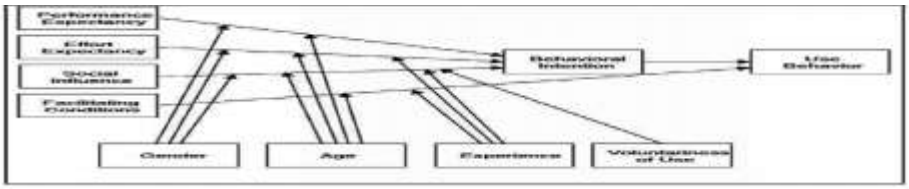

Figure 3: The unified theory of acceptance and use of technology (Venkatesh *et al*., 2003)

Appendix V: Top 10 e-government service list

Table 2: Top 10 e-government service list (Majed, 2015)

1a) Smartcard/biometric ID to facilitate authenticated e-government services 1b) Citizen portal/service gateway 2a) SMS Gateway 2b) Central call center for G2C service information 3) Car importation application and information 4) Car purchase and maintenance services: ✓ Dynamometer car history ✓ Garage service information 5) Traffic advisory services: ✓ accidents ✓ traffic jam alerts ✓ traffic awareness	6) Social support one-stop-shop: ✓ Cash transfer ✓ Emergency aid ✓ Small project loans ✓ Orphan aid ✓ Loans for the disabled ✓ Food aid 7) Civil records: ✓ Birth certificates ✓ Death certificates 8) Health insurance validation (public health insurance) 9) Property tax payment and pertinent sub-services: ✓ assessment information ✓ TBC other sub-services 10) Letter of good standing

Appendix VI: Proposing model for measuring citizens need for public services in e-government

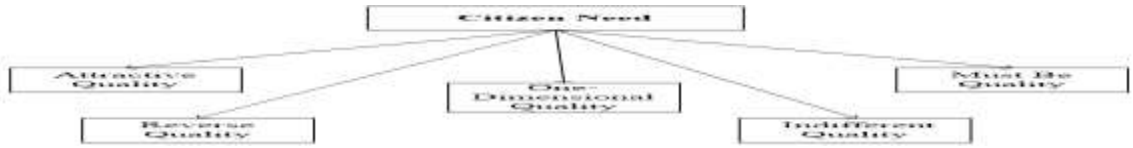

Figure 4: Proposing model for measuring citizens need for public services in e-government

Appendix VII: Proposing model with new variables for measuring citizens' acceptance for public services in e-government

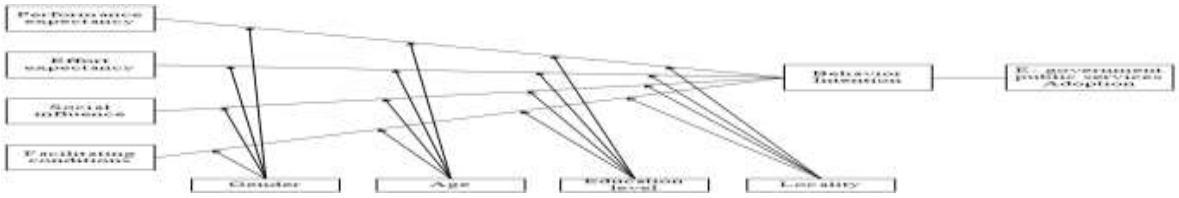

Figure 5: Proposing model with new variables for measuring citizens' acceptance for public services in e-government

Appendix VIII: Research variables

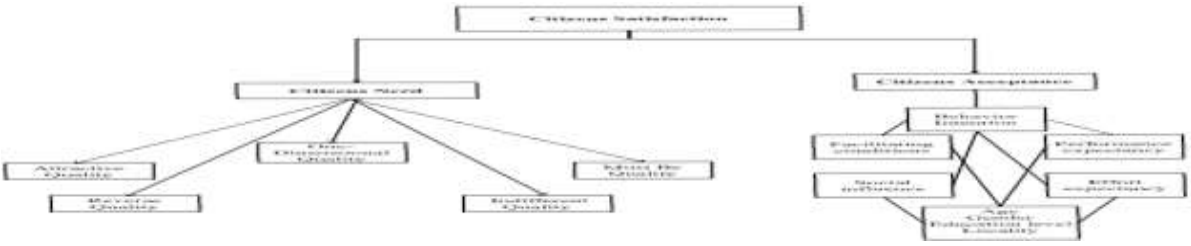

Figure 6: Research variables

Appendix IX: Kano quality elements

Table 3: Kano Quality elements

	E-government Features	A	O	M	I	R	Q	Total	Category
1	Using Single window	44	59	64	33	0	1	201	M
2	Text Message System	55	72	37	35	0	2	201	O
3	centralized call center	53	56	50	38	2	2	201	O
4	Availability for 24 hours / 7 days a week	52	55	55	35	2	2	201	O+M
5	e-payment mechanism	40	67	46	44	0	4	201	O
6	to follow up on applications	44	62	44	46	0	5	201	O
7	personal profile	42	56	51	48	0	4	201	O
8	electronic copies of services	33	61	50	51	0	6	201	O
9	Linking all the services	33	48	57	57	1	5	201	M+I
10	alert mechanism	41	56	59	37	3	5	201	M
11	information about individual financial fees	32	52	62	51	2	2	201	M
12	traffic and warning crises	53	40	38	65	0	5	201	I
13	Smart mobile application	53	61	38	46	0	3	201	O
14	submitted through limited windows	41	49	53	52	5	1	201	M
15	support multi languages	31	43	41	76	4	6	201	I
16	mail service	33	36	51	77	0	4	201	I
17	Provide printing features	36	46	52	60	5	2	201	I
18	frequent update	38	37	66	54	3	3	201	M
19	available any time any where	37	55	48	53	4	4	201	O
20	Access without additional fees	44	65	49	38	1	4	201	O
21	Unify the entry with special code	28	49	60	58	5	1	201	M

Appendix X: Customer satisfaction coefficients

Table 4: Customer satisfaction coefficients

Features	Category	SC	DC
Using Single window	M	0.5	-0.6
Text Message System	O	0.6	-0.5
centralized call center	O	0.6	-0.5
Availability for 24 hours / 7 days a week	M	0.5	-0.6
e-payment mechanism	O	0.5	-0.6
to follow up on applications	O	0.5	-0.5
personal profile	O	0.5	-0.5
electronic copies of services	O	0.5	-0.6
Features	Category	SC	DC
Linking all the services	M	0.4	-0.5
alert mechanism	M	0.5	-0.6
information about individual financial fees	M	0.4	-0.6
traffic and warning crises	A	0.5	-0.4
Smart mobile application	O	0.6	-0.5
submitted through limited windows	M	0.5	-0.5
support multi languages	I	0.4	-0.4
mail service	I	0.4	-0.4
Provide printing features	I	0.4	-0.5
frequent update	M	0.4	-0.5
available any time any where	O	0.5	-0.5
Access without additional fees	O	0.6	-0.6
Unify the entry with special code	M	0.4	-0.6