



# Measurement Models of M-Government Services for Abu Dhabi Government

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DOI: <https://doi.org/10.30880/ijscet.2020.11.02.013>

Received 30 July 2020; Accepted 30 August 2020; Available online 02 September 2020

**Abstract:** This paper presents a formulation and assessment of measurement models which was intended for the study M-Government services by using service quality and customer satisfaction for UAE government. The study was conducted amongst users of Abu Dhabi Police smart application. In this study seven measurement models were identified. Five of the models which are Tangible; Reliability; Responsiveness; Assurance; Empathy are under the cluster of service quality. The other two which are M-services and overall customer satisfaction. A total of 250 questionnaire sets were considered adequate in accordance with the simple random sampling methods used to determine the sample size. The collected data was used in Structural Equation Modeling-AMOS for establishing and analysis each of the measurement model. The results found that all the seven models has achieved all the stipulated fitness criteria for the measurement model. Hence with all the model achieved the fitness level, these models can be used to develop structural model amongst them.

**Keywords:** Abu Dhabi, M-government, M-services, measurement model

## 1. Introduction

Assessment of service quality by customer is important inputs for service providers which aim to improve business performance (Omar, Ariffin & Ahmad, 2016). Organizations that focus on quality will fulfilled stakeholders' needs and likely have higher financial returns (Kwok, Jusoh & Khalifah, 2016, Bello, Martin & Kasim, 2017). Hence this will end up with universal benefits in supply and demand environment business Aloysius, et. al., 2018). Basically, benefit from service quality is ordinarily characterized as the customer's judgment of the benefit prevalence (Kumasey, 2014). In services benefit quality, the levels of benefit in government organizations are based on the relationship between client fulfillments and benefit to suppliers. Client fulfillment can be seen through eagerly repurchase behavior which in turn leads to better future income to the organizations (Ali & Raza, 2017, Kaura, Durga & Sharma, 2015). As a result of coordinating the interface of the benefits which is the issues of service quality and client fulfillment to all organization, UAE Mobile government (M-government) services should have benefit quality on client fulfillment. There are many researches on M-government service such as identifying what problems are holding back the advances of M-government service, whether M-government service is sustainable and others however the M-government service still need at poor quality of services provided by the government (Alanezi, Mahmood & Basri, 2011). About 35% of M-government service projects in developing countries have failed, 50% partially failed and only 15% are successful.

However, the population of UAE is 9,540,000 and only 11.48% are the locals while the rest are the international expatriates. This however, affects the language, background as well as culture of the UAE people. Thus, this leads to so many problems in UAE, different background lead to the gap between customer expectation and M-government services providers, lack of trust on the M-government services at some customers emanate from lack of technical problem. Other problems of human nature as a result of resistance to change from some customers because they prefer traditional way of delivering services. In addition, resistance to change and fear of switching to mobile services for traditional users and the elderly users because of different cultures and level Educational users, increasing the expectations of young users. Moreover, the desire of some government organization for the rapid transformation of mobile services caused them to ignore the required quality standards. In addition, lack of Wi-Fi is also one of the most important reasons that affect the provision of m-government services, which in turn affect customer satisfaction. Therefore, this study intend to Development of New Model of M-Government Services by Using Service Quality and Customer Satisfaction for AD Government.

## 2. Literature Review

Started from 21<sup>st</sup> century, governments and citizens face unprecedented and complex challenges due to industrial revolution. The revolution shifts the industrial activity foundation to renewable energy. A fundamental part of the Third Industrial Revolution and a powerful co-driver is a concurrent information revolution that is practical across all aspects of economic activity and both public and private life via computer-based networks. Promotes the immediate availability and ubiquity of sensitive information Effective and efficient economic exchange and social interaction School & Scholl, 2014).

Main intention of M-government service is to take advantages of technology to engage between government and its citizens. M-service integrate all the public services and make it easier through smart phone application. There many challenges in the implementation of M-services likes business community does not leads the implementation; low usage by the government customers and the mobile apps and services have not been fully integrated (Kaura, Durga & Sharma, 2015). In the context of Abu Dhabi M-government service, it was aimed to attract the globally renowned public facility to ensure the best impact among individuals and organizations. Besides, the Abu Dhabi Strategic plan 2030 is to ensure that the government sector will help to transform Abu Dhabi to become more effective and efficient government in Middle East region.

Based on the previous studies, the desire of UAE government to transform from electronic services to mobile services has caused problems to customer satisfaction on these services. In addition, resistance to change and fear of switching to mobile services for traditional users and the elderly users is because of different cultures and education. Traditional and elderly users are reluctant to change or fear of switching to mobile services because of cultures and education. However educated and young users expecting wide and quality mobile government services. Some government organizations are desired for the rapid transformation of mobile services but ignore the required quality standards. In addition, lack of Wi-Fi is also one of the most important reasons that affect the provision of m-government services, which in turn affect customer satisfaction. UAE government has undergone various administrative reforms since the establishment of the Union in 1971. It reformed the role of national leaders in instilling a culture of service improvement and efficient policy implementation with multiple tools. Recently, the national leadership vision is to achieve people's wellbeing through reconfiguring e-Government services. At the beginning of 2013, the UAE government launched an innovative idea of the M-government which is a modified vision to surpass the e-government strategy Al-Meqbaali & Kasim, 2017).

In this study, customers are general public especially who are being served by the M-government services while government is considered as a professional service provider. Customers are general public who are associated with the input and output of the process of the M-services (Kaura, Durga & Sharma, 2015). However, the current study aims to find out the relationship between service quality and customer satisfaction on M-government service in UAE. Therefore, this study intend to development new model of M-Government services by using service quality and customer satisfaction for UAE government. The model is about the influenced of services quality and overall customer satisfaction to the M-government services. Further review work indicates that service quality is influenced by five dimensions which are Tangible; Reliability; Responsiveness; Assurance and Empathy. However for this article, it only presents the formulation and evaluation of seven measurement models which are 5 from service quality and one from overall customer satisfaction and one from M-government services

## 3. Methodology

This study adopted quantitative approach where the data was collected through questionnaire survey and the findings of the study are in deductive manner. The collected data was used to develop and asses the structural relationship of m-government model for Abu Dhabi police sector. The population of the survey are users of the smart application of Abu Dhabi police. The survey adopted sample random technique where each sample has an equal probability of being chosen. A sample chosen randomly is meant to be an unbiased representation of the total population. While, the sample

size was based on the ruling of ten times rule of SEM modelling (Hair, 2010). A total of 250 questionnaire sets were distributed amongst the targeted respondents however only 231 responses are valid for this study. This represents 92.4% response rate which is considered very good. The collected data was analyzed for missing data, reliability test and normality test. The processed data was used to develop the measurement models that were identified in the literature review.

#### 4. Confirmatory Factor Analysis (CFA)

The conceptual model gives the layout structural relationship of the constructs. Before constructing and evaluating the structural relationship, all the constructs need to be evaluated using CFA. CFA is needed to perform in order to empirically test the hypothesized relationships presented in the conceptual model. This is because CFA is considered a reliable technique for testing the validity of theory (Hair, 2010).

In this study the validity of the conceptual model was tested by employing covariance-based structural equation modeling (CB-SEM) technique using Analysis of Moment Structure (AMOS). The analysis followed the CB-SEM methodology prescribed in the number of multivariate texts. The analysis begin with;

- Specification of the model;
- Model identification;
- Estimation of parameters;
- Assessment of goodness-of-fit and
- Finally model re-specification.

This procedure was repeatedly followed in the assessment of both the measurement models and the structural models of the research until a valid model is achieved. It was suggested that a model should satisfy the requirement of at least one index from each of the indexes categories, that is, absolute fit, incremental fit and parsimonious fit indices. In respect of the RMSEA, the range values from 0 to 0.08 is considered acceptable in assessing model fit (Hair, 2010, Byrne, 2013). The validity of the models was evaluated based on the established criteria for CB-SEM evaluation presented in Table 1.

**Table 1 - Recommended goodness-of-fit indices**

Index Category	Indices Used	Acceptable level	Supporting source
Absolute fit index of Chi-square	Chisq.	$P < 0.05$	Hair ( 2010), Byrne (2013),
Normed Fit Index	NFI index	Value $\geq 0.95$	Wheaton &
Non Normed Fit Index / Tucker Lewis Index	NNFI/TLI	Value $\geq 0.95$	Muthen (1977), Browne &
Root Mean Square of Approximation	RMSEA	Value $\leq 0.08$	Cudeck (1993), Jorekog &
Goodness of Fit Index	GFI	Value $\geq 0.95$	Sorrbom (1988),
Adjusted Goodness of Fit Index	AGFI	Value $\geq 0.90$	Tanaka& Huba (1985), Bentler (1999), Marsh &
Comparative Fit Index	CFI	Value $\geq 0.90$	Hocevar (1985)
Parsimonious fit	Chisq./df	Value $\leq 5.0$	

Physical measurement model is a graphically representation of the relationship between response items and its underlying tangible construct. Before a structural model can be developed, all the measurement models need to be developed and evaluated until the models achieve the fitness indices. This study develop and evaluate seven measurement model using CFA function of the AMOS-SEM software. Each of the measurement model has its items which are the questions in the questionnaire. Hence the results of all the measurement models are as in **Table 2**.

**Table 2 - Measurement model with its items**

No	Measurement Model	No of items	Items	Latent construct	Construct
1	Tangible	9	Q13 to Q21	Services Quality	Independent
2	Reliability	8	Q22 to Q29		
3	Responsiveness	8	Q30 to Q37		
4	Assurance	8	Q38 to Q45		
5	Empathy	8	Q46 to Q53		
6	M-government Services	12	Q1 to Q12	-NA-	Mediation

7	Overall Customer Satisfaction	8	Q54 to Q61	-NA-	Dependent
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In the process of construct of the reliability measurement model in AMOS application, it is important to notice that the minimum number of items needed to measure a latent construct should not be less than four (4) and this is to avoid the model identification problem during the analysis process. Examination of each measurement model involves the evaluation of factor loading for each item, squared multiple correlation and fitness indexes (Ghafar et. al., 2015, Hair, 2010).

### 4.1 Tangible Measurement Model

For the tangible measurement model, it has 9 items. The final model of tangible is as in Fig.1. Based on the information in the figure, it indicates that the observed values had achieved the acceptable values for model fitness.

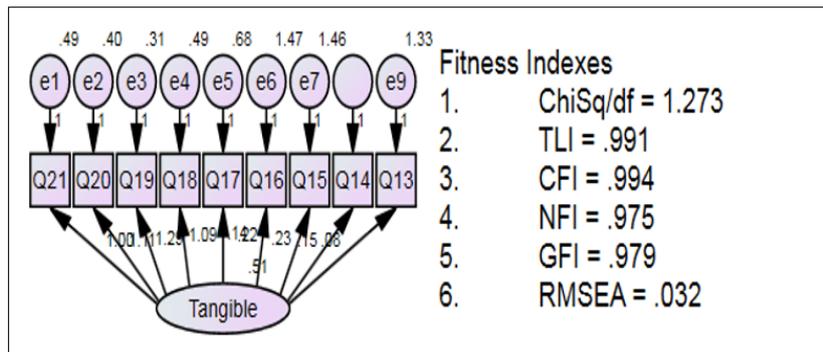


Fig. 1 - Tangible measurement model

### 4.2 Reliability Measurement Model

For the reliability measurement model, it has 9 items. The final model of reliability is as in Fig. 2. Based on the information in the figure, it indicates that the observed values had achieved the acceptable values for model fitness.

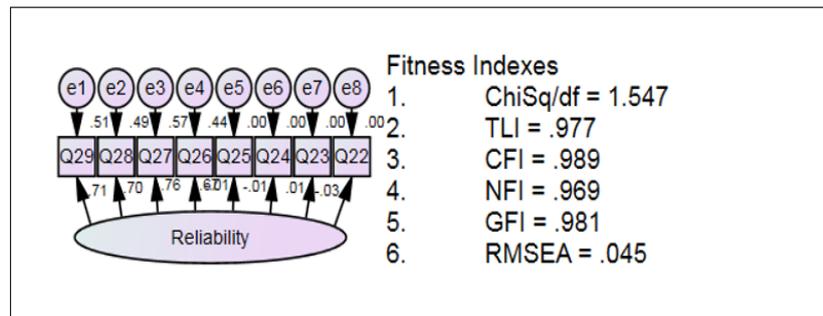


Fig. 2 - Measurement model for reliability

### 4.3 Responsiveness Measurement Model

For the responsiveness measurement model, it has 8 items. The final model of responsiveness is as in Fig.3. Based on the information in the figure, it indicates that the observed values had achieved the acceptable values for model fitness.

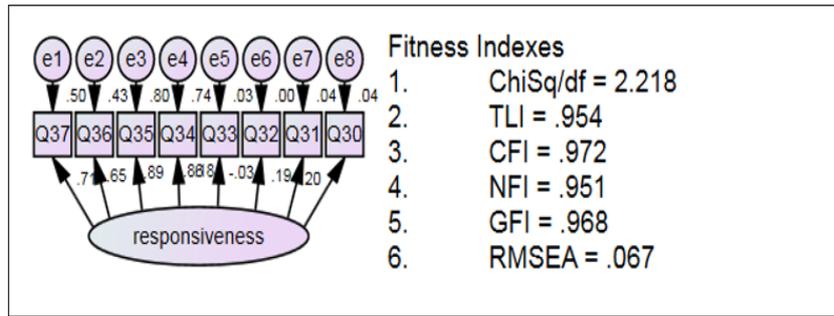


Fig. 3 - Measurement model for responsiveness

#### 4.4 Assurance Measurement Model

For the assurance measurement model, it has 8 items. The final model of assurance is as in Fig. 4. Based on the information in the figure, it indicates that the observed values had achieved the acceptable values for model fitness.

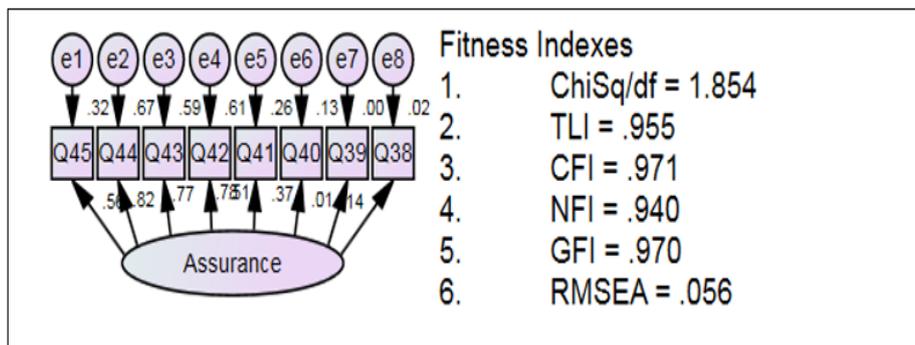


Fig. 4 - Measurement model for assurance

#### 4.5 Empathy Measurement Model

For the empathy measurement model, it has 8 items. The final model of empathy is as in Fig. 5. Based on the information in the figure, it indicates that the observed values had achieved the acceptable values for model fitness.

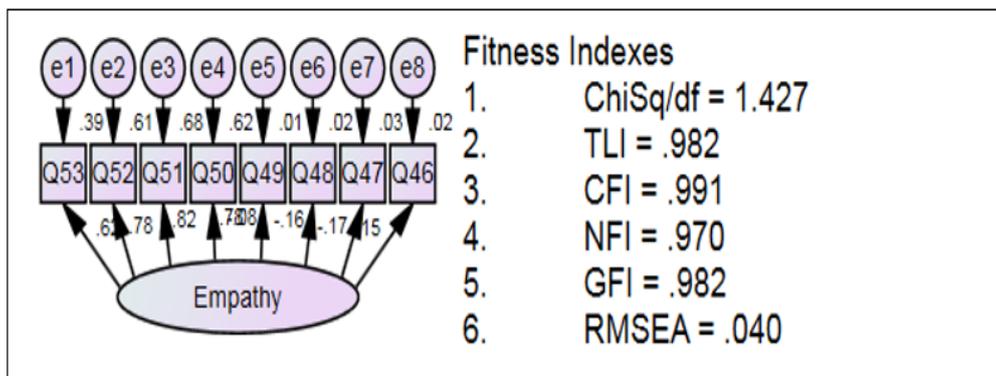


Fig. 5 - Measurement model for empathy

#### 4.6 M- Service Measurement Model

For the M-Service, it has 12 items. The final model of M-Service is as in Fig. 6. Based on the information in the figure, it indicates that the observed values had achieved the acceptable values for model fitness.

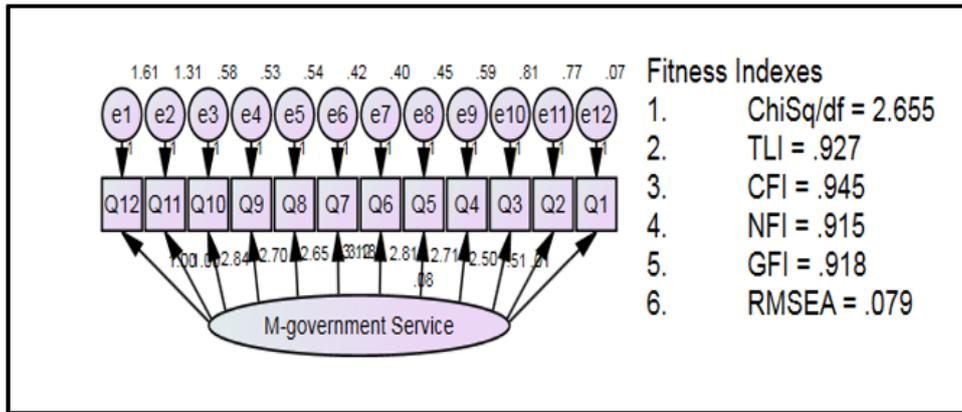


Fig. 6 - M-Service

#### 4.7 Overall Customer Satisfaction Measurement Model

For the overall customer satisfaction model, it has 8 items. The final model of overall customer satisfaction is as in Fig.7. Based on the information in the figure, it indicates that the observed values had achieved the acceptable values for model fitness.

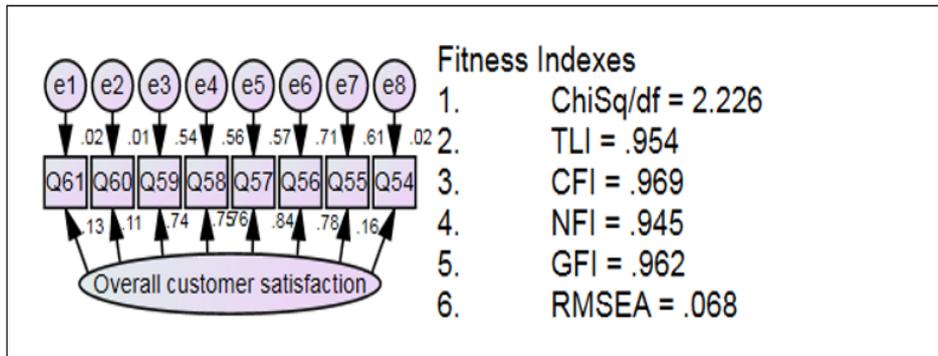


Fig. 7 - Overall customer satisfaction Measurement model

#### 4.8 Summary of All the Measurement Models

The summary results of all the measurement models are as Table 3.

Table 3 - Results of all the seven measurement models

Indices Used	level	Seven measurement models						
		Tangible	Reliability	Responsiveness	Assurance	Empathy	M services	Overall customer satisfaction
Chisq/df	≤ 5.0	1.273	1.547	2.218	1.854	1.427	2.665	2.226
TLI	≥ 0.95	0.991	0.977	0.954	0.955	0.982	0.957	0.954
CFI	≥ 0.90	0.994	0.989	0.972	0.971	0.991	0.945	0.969
NFI	≥ 0.95	0.975	0.969	0.951	0.940	0.970	0.955	0.954
GFI	≥ 0.95	0.979	0.981	0.968	0.970	0.982	0.918	0.962
RMSEA	≤ 0.08	0.032	0.045	0.067	0.056	0.040	0.79	0.068

Results from Table 3 indicates that all the seven measurement models that are considered in this study had achieved the minimum threshold values as stipulated in the assessment criteria as in Table 1.

## 5. Conclusion

This article has presented the formulation and the evaluation of measurement models. These measurement models are to form structural relationship of three components which are Service Quality, Overall Customer Satisfaction and M-government services. However the service quality component consisted of five dimensions which are Tangible; Reliability; Responsiveness; Assurance and Empathy. Thus, the overall measurement models are seven units. As presented earlier in this paper all the seven model formulated and evaluated with using AMOS-SEM graphical software. It was found that all the seven measurement models had achieved the acceptable criteria level of fitness. This mean all the models are fit which can be used in the structural path analysis.

## Acknowledgement

The authors would like to thank the Universiti Tun Hussein Onn Malaysia for supporting this research work.

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