



## **Developing a New Measuring Instrument of Service Quality for the Public Sector**

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### **Abstract**

In today's vast global economic reform, the public sector faces huge challenges to sustain and remain competitive due to the new policies introduced by the government, rising demand for public services, changing digital era as well as to achieve zero complaints filed by the general public. Therefore, to remain competitive public sector entities must satisfy various level of citizens' needs, thus it is essential to analyze the means of measuring and evaluating service quality provided by the public sector. Previous studies have produced scales that bear a resemblance to generic measures of service quality, which may not be totally adequate in assessing the perceived quality in the public sector. This paper aims to identify the critical factors of the public sector service quality from the standpoint of citizens as primary evaluators of public sector services, thus a new instrument to measure public service quality is proposed. A proposed 27-item instrument has been empirically tested for unidimensionality, reliability and validity using both exploratory and confirmatory factor analysis. The results demonstrated that public sector service quality has five dimensions namely 'Systemization', 'Employee Oriented', 'Assurance', 'Hospitality' and 'Efficiency', and subsequent multiple regression analysis revealed that 'Systemization' is the most important service quality dimension within the public sector.

**Keywords:** Service quality, Public sector, Critical factor, Satisfaction.

### **1. Introduction**

To date, the public sector is under increasing pressure to prove that their services are customer-focused and continuous performance improvement is being conveyed (Ramseook-Munhurrin *et al.*, 2010). Furthermore, the need to improve service delivery was fueled by public pressures to cut costs and the empowerment of front-line workers. (Lonti and Verma, 2004). This is due to the increasing customer awareness when it comes to their financial decisions, thus demanding the best services with the best value for money through more efficient and convenient channels (Abdullah *et al.*, 2011). The public sector services performance will always set the standard to ensure the national prosperity.

"Improved service quality will make public sector organizations more productive and less of a drag on the economy, and because of the reduced necessity of increasing taxes, will make domestic industry more competitive in the global market" (Cohen & Brand, 1993). As from the individual perspective, satisfied customer, client or citizens tend to be more negotiable to pay for the services provided in any circumstances. For instance, Furnham (1983) and Glaser & Hildreth (1999) have proposed that there is positive relationship between citizens' perceptions of government performance

and willingness to pay taxes. Service quality has widely been used as a predictor of the overall customer perception towards the services provided. Various attempts and efforts to evaluate service quality performance have been undertaken previous years back on industrial marketing by adapting SERVQUAL model to get the outcome (Sachdev & Verma, 2004; Carman, 1990; Bolton & Drew, 1991). Parasuraman *et al.*, (1985, 1988) proposed a well-known framework and the most dominant scale for measuring service quality, the SERVQUAL, which has been used in various sectors consisting of five key dimensions such as reliability, responsiveness, tangible, empathy and assurance.

In fact, a number of study have proposed variety key dimensions of service quality such as tangible (Ilhamiee, 2010; Ramseok-Munhurrin *et al.*, 2010), reliability ( Ilhamiee, 2010; Abdullah *et al.*, 2010; Ramseok-Munhurrin. *et al.*, 2010; Yunus *et al.*, 2009), empathy (Rashid, 2008; Ilhamiee, 2010; Abdullah *et al.*, 2010; Ramseok-Munhurrin *et al.*, 2010; Yunus *et al.*, 2009), assurance (Rashid, 2008; Ilhamiee, 2010; Ramseok-Munhurrin *et al.*, 2010; Yunus *et al.*, 2009), and responsiveness (Rashid, 2008; Ilhamiee, 2010; Abdullah *et al.*, 2010; Ramseok-Munhurrin *et al.*, 2010; Yunus *et al.*, 2009). However, Carman (1990) and Babakus and Boller (1992) indicated that the five dimensions are not generic, and that they should be industry-specific. Abdullah *et al.*, (2011) discover another factor in measuring the service quality but in another area (bank service quality) which are systemization of service delivery, and reliable communication. Although much of the research previously has used SERVQUAL focuses on the five dimension, it is also important not to lose sight of other dimension that has been proposed by Parasuraman *et al.*, (1985) ; communication, credibility, security, competence, courtesy, understanding and access.

Hence, there is the need to develop service quality models in public sector so that the management will be able to see what is right and wrong, as it has been argued that attempts to improve quality management are being prevented because of the lack of instruments designed to measure quality (Galloway, 1998). Service quality has been one of the most popular topic carried out in the marketing literature, with studies being carried out in a variety of industries such as the hospitality industry and tourism (Saleh & Ryan, 1992; Fick & Ritchie, 1991), airline service (Abdullah, *et al.*, 2007), hospitals (Babakus and Mangold, 1992; Soliman, 1992), education sector (Abdullah, 2005: 2006) banking (Kwon and Lee, 1994, Abdullah *et al.*, 2011), other industries such as libraries (Cook *et al.*, 2003) and few were done on measuring the public sector service quality (Wisniewski, 2001).

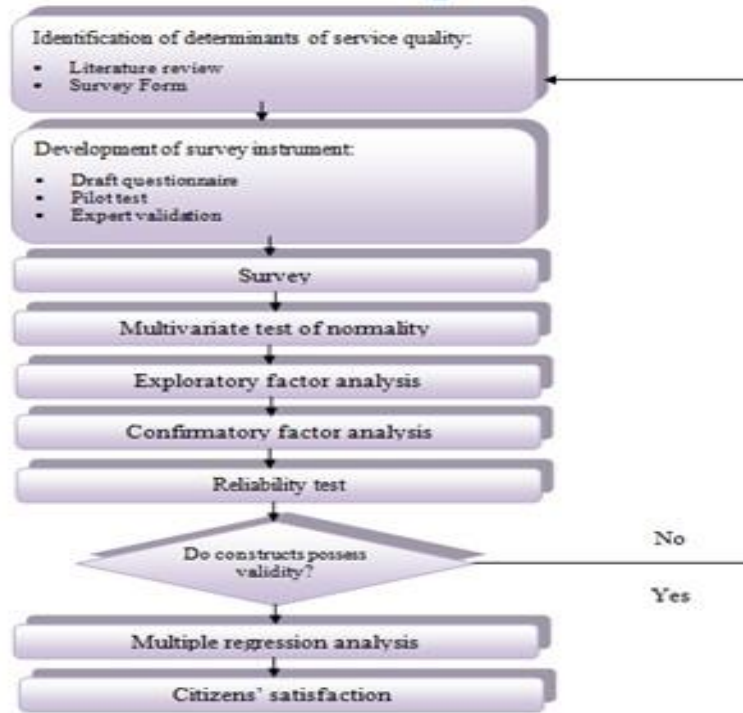
Despite, research on a study of public sector in Malaysia has been done and focused on Road Transport Department and does not cater all public sector in general (refer Rashid, 2008). From the literature on service quality, it is evident that the majority of studies have applied SERVQUAL in assessing the quality of services provided by public organisations (Azmi *et al.*, 2008). However, the use of existing measurement, in particular SERVQUAL model does not fit every services sector but it can be replicated and revised. It may have been used to measure industrial marketing services but the measurement scale cannot be appropriate to a wide variety of services (Abdullah *et al.*, 2011), in particular the public sector.

## **2. Research Design & Methodology**

This paper aims to develop and validate the measuring instrument of the service quality specifically designed for public sector services using both qualitative and quantitative measures. In particular, the study attempts to qualitatively determine the critical factors or determinants of service quality as perceived by the citizens, to incorporate the qualitatively generated determinants into a Likert-type instrument, and to administer the instrument to a sample population consisting of citizens in Sarawak, Malaysia as the primary evaluators of public sector services. The stages involved are shown by means of the flow chart in Figure 1. The questionnaire consisted of four sections which are Section A, B, C and D. Section A contained 10 questions pertaining to respondent profile. Meanwhile, section B contained 44 items related to the determinants of service quality in the form of statements were presented on the questionnaire, with the same rating scale used throughout. The items were measured on a five-point Likert-type scale that vary from 1=strongly disagree to 5=strongly agree. In addition to the main scale addressing individual items, respondents were asked to provide an overall rating of the satisfaction level, quality of service, and future visit as included in Section C. Section D was an open-ended questions allowing respondents to give their opinion on how any aspect of the public sector services could be improved. Multistage sampling procedure was used for the study whereby the respondent was stratified according to state division, followed by racial composition, and

gender. Data have been collected using the ‘personal-contact’ approach whereby each respondent was approached personally by the selected enumerators representing each division in Sarawak. The survey also attached a cover letter to ensure respondent’s confidentiality and emphasize the independent nature of the research. A total of 1,210 questionnaires were distributed, and 1,005 were returned yielding a response rate of 83.0%. The high response rate was due to the ‘personal contact’ approach used followed by frequent follow-ups with the ‘contact persons’. The number of usable sample size was in line with the generalised scientific guideline for sample size decisions as proposed by Krejcie and Morgan (1970).

**Figure-1.** Identifying the critical factors of public sector service quality

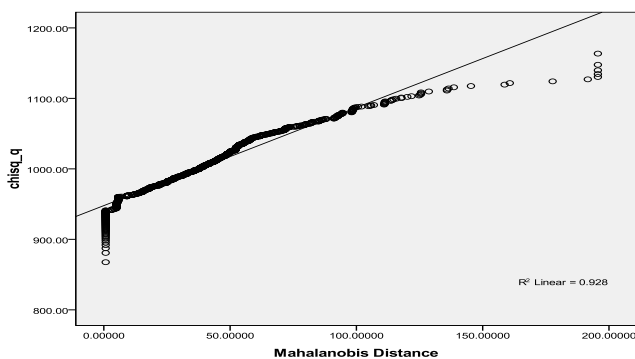


### 3. Finding Analysis

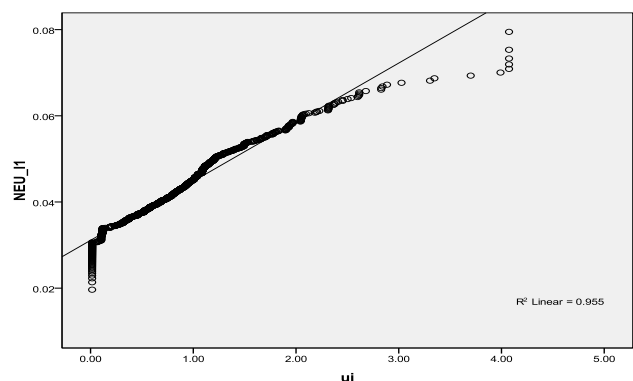
#### 3.1. Multivariate Normality Test

Multivariate normality test was conducted in order to check a given set of data for similarity to the multivariate normal distribution through the scatterplots of *chis\_q* vs. *di\_sq* and *neu\_i* vs. *Ui* (Figure 2.1 & 2.2). The results indicated that the fit for both methods is good  $R^2=0.928$  and  $R^2=0.955$  respectively, and the plot is almost linear thus implying the data is multivariate normal.

**Figure-2.1.** Multivariate test of normality



**Figure-2.2.** Multivariate test of normality



### 3.2. Factor Analysis

Both exploratory and confirmatory factor analyses were used to assess the dimensionality of the service quality measure. Preliminary testing suggests that all correlations are above 0.30 which is considered substantial for factor analysis (Hair *et al.*, 1995). The next step involves assessing the overall significance of the correlation matrix with Bartlett test of sphericity, which provides the statistical probability that the correlation matrix has significant correlations among at least some of the variables. The results were significant at  $p < 0.01$ ,  $\chi^2$  (31, N=1005), which further confirmed that the data were acceptable for factor analysis. Finally, Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was computed to quantify the degree of intercorrelations among the variables, and the results indicate the figure of 0.98, a 'marvelous' sign of adequacy for factor analysis (Kaiser, 1970). As for the adequacy of the sample size, there is a 49-to-1 ratio of observations to variables in this study. According to Nunnally (1978), the ratio for adequate sample size should be at least 10:1 which, in this case falls well within the acceptable limits.

In order to gain a clearer understanding of the factor structure, all the 44 dependents variables from the questionnaire were subjected to factor analysis, utilizing the principal component procedure which was followed by a varimax rotation. Factor loading of 0.50 above is required for significance which indicates that the items associated strongly with the factor (Hair *et al.*, 1995). Table 1 shows the results of factor analysis in terms of factor name, the variables loading on each factor and the variance explained by each factor. These five factors can be described as follows:

#### Factor-1. Systemization

This factor emphasize on getting services done in a systematic, well organized and in appropriate manner. This involved delivering excellent services in such aspect: highly technological capability and innovation, effective communication, procedures and processes and good ethical conduct. In addition, it emphasize on the ability of the agencies to provide a very sophisticated environment as well as to instill confidence among citizens in delivering their services. It was identified as an important service quality indicator (Ahire, Landeros & Golhar, 1995; Milakovich, 1995; Sureshchandar, Rajendran & Anantharaman, 2002, Abdullah *et al* 2010).

#### Factor-2. Efficiency

This factor relates to the capability and the competency of the public agency in delivering services to the public. Being consistent in providing the best services, knowing the customers' specific needs are the most important aspects for this dimension. This factor also relates to the tendency of the public sector to reach their customers in various means of telecommunication and providing efficient, friendly e-government system and procedures (Parasuraman, 2000).

#### Factor-3. Assurance

This factor emphasize on instilling trust and being believable in delivering services to the public and their ability to ensure citizens' confidentiality while receiving their services. It suggests the importance of the public sector to employ the right people to perform their duty as well as employees exhibiting a pleasant, courteous and professional behavior in service delivery process so as to create a comfortable atmosphere among customers. This factor also relates to the ability of the employees to communicate their services in a most understandable way to the customer. In addition, it was identified as an important service quality indicator (Gronros, 1984; Ghobadian 1994, Parasuraman *et al.*, 1988, Abdullah F. 2005, 2006).

#### Factor-4. Hospitality

This factor describes the ability of the agencies in providing and creating warm atmosphere while dealing with customers, making them feel comfortable while receiving services, portraying good image of the agencies and deliver prompt service. It suggests the importance of the employees to look attractive, show sincere interest in solving customers' problem, provide visually appealing environment and keep records accurately. Being one of the most powerful tools in services marketing, hospitality should be considered as the critical success factor in services industry (Kitsios, 2006).

**Factor-5. Employee Oriented**

This factor describes employees' ability in influencing the customers in a way to promote the government's desire to deliver excellent services to all, regardless of different races and religions. This involved delivering services in terms of fulfilling promises and requirements to the customers. In addition, it also relates to the willingness, and competency of employees in answering specific customers' queries and requests. Other than that, employee-oriented requires mutual trust between employer and employee in order to be sustainable. Being based on trust, employee-oriented CSR presupposes a high work morale (de Jong D.J, 2011)

**Table-1.** Results of Factor Analysis (Factor Loadings)

VARIABLES	COMPONENT				
	1 (SYS)	2 (EFF)	3 (ASSRC)	4 (HSP T)	5 (EMP L)
Improved in its technological capability and innovation	.692				
Services are dependable and reliable	.661				
effective customer complaint procedures and processes	.647				
Good communication / multilingual skills	.645				
up- to- date equipment	.624				
Conducive ambience	.621				
Excellent ethical conduct of employees	.604				
explains its services accurately to the customers	.545				
strategic location / services easily accessible	.501				
understand customer specific needs		.698			
Services are easily accessible by various means of telecommunication		.649			
always make sure that its performance is of the highest standard		.633			
consistently provide the best quality service		.601			
able to handle problem quickly		.562			
trusted services		.545			
efficient and friendly e-government system and procedures		.500			
comfortable dealing with employees			.692		
Employees are courteous and professional			.648		
right people to perform their duty			.618		
provides services that are relevant to customer need			.523		
Provides caring and paid personal attention			.500		
Employees are well dressed and neat in appearance				.695	
show sincere interest in solving customers' problems				.603	
Physical facilities are visually appealing				.611	
keeps its records accurately.				.587	
communicate in an understandable way			.533		
Respect				.587	
displays clear and complete information regarding its services				.563	
Adequate Parking Space				.519	
fulfills the requirement of "1Malaysia- Rakyat Didahulukan, Pencapaian Diutamakan" in					.600

delivering its services to the customer					
Employees are willing to give information regarding their services.					.558
Employees have the knowledge to answer specific queries and requests from customers					.540
provides highly standardized and simplified service delivery process					.532
fulfills customer requirements/ giving more than their expectation.					.519
<b>Eigenvalues</b>	<b>6.5</b>	<b>5.4</b>	<b>5.2</b>	<b>5.0</b>	<b>4.5</b>
<b>% of variance</b>	<b>14.8</b>	<b>12.2</b>	<b>11.6</b>	<b>11.5</b>	<b>10.3</b>
<b>Cumulative %</b>	<b>14.8</b>	<b>27.1</b>	<b>38.7</b>	<b>50.2</b>	<b>60.5</b>

### 3.3. Multicollinearity

Multicollinearity refers to a condition that occurs when one or more of the independent variables are highly correlated with one or more of the other independent variables. As for this study, all the 44 items were subjected to regression analysis utilizing collinearity diagnostics and the results indicated the absence of multicollinearity whereby, the figure of VIF among all these items were below 0.3.

### 3.4. Confirmatory Factor Analysis

Confirmatory factor analysis was used to test whether measures of a construct are consistent with a researcher's understanding of the nature of that construct (or factor). For this study, the data was analysed using LISREL framework (Joreskog and Sorbom, 1978). A five-factor measurement model was specified for each construct and the model parameters were estimated using LISREL 9.1 (Scientific Software International, Inc, Copyright 2006). Table 2 shows the fit indices using Chi-Square test, GFI, AGFI, CFI, NNFI, IFI and RMSEA. Analysis of this model resulted in fit indices that did not satisfactorily account for the data. Thus, modifications were made to the present model to gain a more satisfactory account of the data whereby items are identified through the jackknife procedure and eliminated from the model without altering the measurement or structural integrity of the model (Larwin and Harvey, 2012). This is to confirm which item best represented one factor and vice versa. As presented in table 3, seven items were deleted from the Service Quality Construct Model. The items from the item-deletion procedure, which created the best fitting model based on the CFI and RMSEA estimates, were manually deleted from the subsequent runs of the model. As revealed in Table 3, the final model of 27 items demonstrated an improved fit relative to the full model of 33 items. The improved five-factor measurement model is as presented in Table 4 which resulted in a more satisfactory account of the data.

The first fit measure to be reported is the Chi-square statistic, which indicates the amount of difference between expected and observed covariance matrices. Jöreskog (1969) coined that the chi-square test is widely recognized to be problematic because it is very sensitive to sample size. Although the overall chi-square test was reported, reliance on the chi-square test as the sole measure of fit in a structural equation model is not recommended due to its sensitivity to sample size, especially for cases in which sample size exceeds 200 respondents (Hair *et al.*, 1998). Anderson & Gerbing (1988) suggested that refinement of the measurement model is required when the results indicates poor fit. Therefore, it is often preferred to evaluate model fit based on other fit statistics namely GFI, AGFI, CFI, NNFI, IFI to assess the "goodness of fit" of the measurement model (Byrne, 2001). The GFI value of 0.92 indicated an acceptable fit for the model. Non-Normed Fit Index (NNFI) is another indicator that is commonly used to measure model fit (Bentler & Bonett, 1980), and the value of 0.98 is an indication of good fit. The next fit measure is the Comparative Fit Index (CFI), which assesses overall improvement of a proposed model over an independence model where the observed variables are uncorrelated (Byrne, 2001). The value of CFI in this present model has acceptable value of 0.98, an indicator of good fit. The next measure to consider is the Root Mean Square Error of Approximation (RMSEA). As reported in Table 4, the RMSEA value for the five-factor model was

0.06, an evidence of reasonable fit to the data (Bentler & Hu, 1999). Therefore, it was concluded that the five-factor service quality model fits reasonably well and represents a close approximation in the population (refer figure 3).

**Table-2.** Unidimensionality for Service Quality Constructs

<b>Dimension</b>	<b>Fit Indices</b>
Chi-square ( $\chi^2$ ) ( $p=0.00$ ) Degree of freedom ( $df$ ) = 454	2453.43
Goodness-of-fit index (GFI)	0.86
Adjusted goodness-of-fit index (AGFI)	0.84
Comparative fit index (CFI)	0.98
Non-normed fit index (NNFI)	0.98
Incremental fit index (IFI)	0.98
Root mean squared error of approximation (RMSEA)	0.06

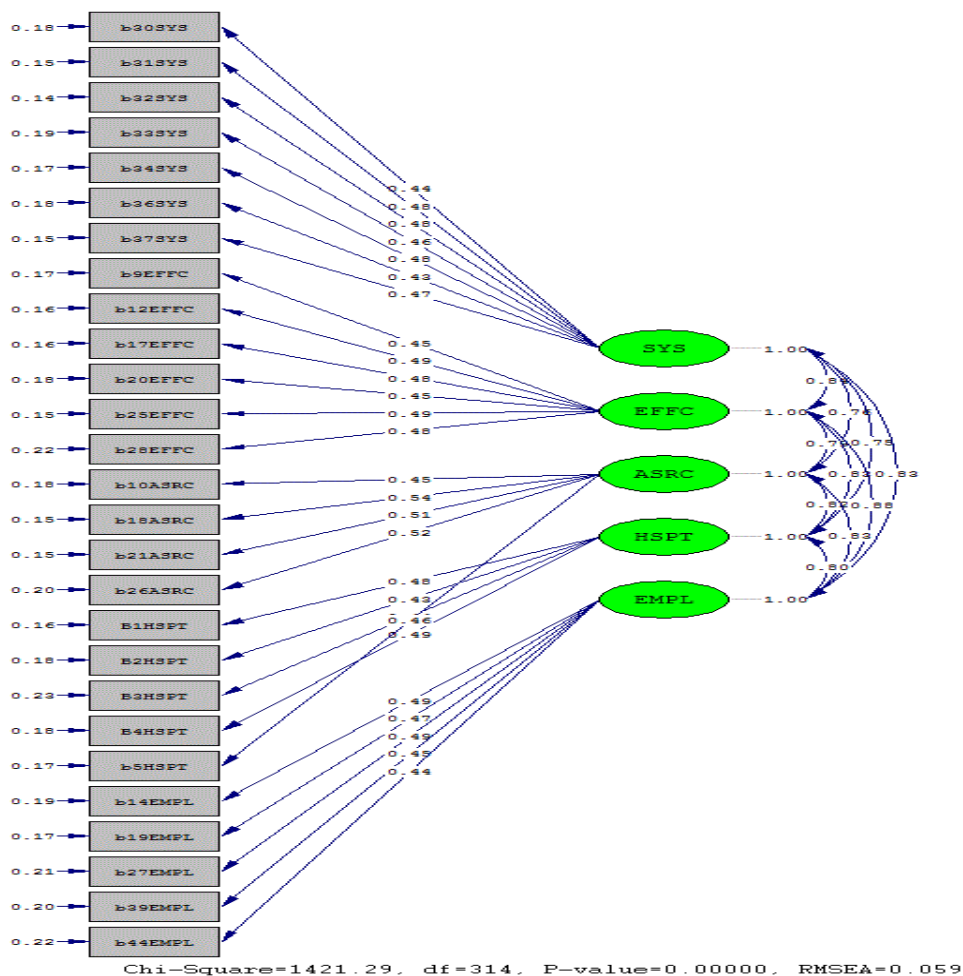
**Table-3.** Jackknife Item-Elimination Results for Service Quality

<b>Item deleted</b>	$\chi^2$	$Df$	<b>GFI</b>	<b>AGFI</b>	<b>CFI</b>	<b>NNFI</b>	<b>IFI</b>	<b>RMSEA</b>
<b>6</b>	2545.27	485	0.861	0.839	0.981	0.979	0.981	0.0650
<b>7</b>	2379.81	454	0.865	0.843	0.981	0.977	0.981	0.0650
<b>8</b>	2255.34	424	0.867	0.844	0.981	0.980	0.981	0.0656
<b>15</b>	2062.99	395	0.874	0.851	0.982	0.980	0.982	0.0648
<b>16</b>	1871.47	367	0.880	0.857	0.982	0.980	0.982	0.0639
<b>38</b>	1701.49	340	0.887	0.865	0.983	0.981	0.983	0.0631
<b>43</b>	1483.95	314	0.897	0.876	0.984	0.983	0.984	0.0609

**Table-4.** Unidimensionality for Service Quality Constructs

<b>Dimension</b>	<b>Fit Indices</b>
Chi-square ( $\chi^2$ ) ( $p=0.00$ ) Degree of freedom ( $df$ ) = 314	1421.29
Goodness-of-fit index (GFI)	0.90
Adjusted goodness-of-fit index (AGFI)	0.88
Comparative fit index (CFI)	0.98
Non-normed fit index (NNFI)	0.98
Incremental fit index (IFI)	0.98
Root mean squared error of approximation (RMSEA)	0.06

**Figure-3.** Path Diagram of the Five Constructs of Service Quality



### 3.5. Reliability Analysis

Two internal consistency estimates of reliability namely coefficient alpha and split-half coefficient expressed as Spearman-Brown corrected correlation were computed for the five service quality constructs. The results indicated that all the values met the required prerequisite of 0.70, thereby demonstrating that all the five constructs are internally consistent and have satisfactory reliability values in their original form.

### 3.6. Validity Test

In this study, content and face validity, convergent validity, discriminant validity and criterion-related validity was conducted for further assessment. Since the study had undertaken several steps previously through vigorous searching for literature review to determine the construct, survey form to generate questionnaire items, expert validation to elicit the most appropriate instrument relevant, both face and content validity test were ensured (Churchill, 1979). Whereas for the study, the convergent validity through Pearson correlation value averaging 0.7 shows that all the dimensions are correlated to each other.

Discriminant validity on the other hand was established to test whether each dimension is different from each other or otherwise. In this test, A Chi-square difference test was employed and the result revealed that the five constructs were statistically significant at the  $p=0.001$  level, thus indicating that all the five factors are distinct constructs, a strong indicator of discriminant validity. The next validity test is Criterion validity which was undertaken to assess the performance of the measure against some criterion. In this stage, all the constructs scores was correlated with the three dependent variables namely service quality, satisfaction and loyalty. As for the study, the results of the



correlation between the constructs and the three variables indicated that all the constructs have significant positive correlations. Thus, criterion-related validity is established for all the five factors.

### 3.7. Multiple Regression Analysis

Regression analysis was carried out to analyze the associative relationships between a metric dependent variable and one or more independent variables. In other words, regression was used to determine the overall effect of the five dimensions on the service quality level (or how well the five dimensions predicted service quality), and to assess the relative importance of the individual dimensions. Next stage involve close determination on effect size of the study whereby multiple regression test was employed to evaluate how well the five constructs explained the citizens' satisfaction scale. Considering the citizens satisfaction as the dependent variable and the five constructs as the independent variables, the result of the multiple regression analysis indicates that the associative relation is significant at  $p=0.001$  level with R square value indicating that 34.4 % of the variance in the citizens' satisfaction was explained by service quality factors. As for the relative influence, Systemization is found to be the most important factor of service quality in the public sector, with the Beta value of 0.62 followed by Employee Oriented, Assurance, Hospitality, and Efficiency respectively.

## 4. Conclusions

This paper has contributes further to the fast growing literature on service quality by introducing a new 27-item measuring instrument, specifically designed for the public sector. Such valid and reliable measuring scale would be a tool that public agencies could use to improve service performance in the competitive services industry. The results from the current study are crucial because previous studies have produced scales that bear a resemblance to *SERVQUAL*, a generic measure of service quality, which may not be totally adequate to assess the perceived quality in the public sector. Thus, the present study captured citizens' evaluation of service quality in a 27-item questionnaire exclusively adapted to the unique nature of the public sector, which confirmed the five factors namely systemization, employee oriented, assurance, hospitality and efficiency in their order of importance.

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