The Construction and Validation of Dimensions and Scale of the Police Service Quality on Virtual and Real Integration- A Case of Kaohsiung City Police Department

[a] Shih-Hsing Cheng, [b] Yu-Lung Wu, [c] Li-Chuan Huang *

[a] Department of Information Engineering, I-Shou University,
No.1, Sec. 1, Syuecheng Rd., Dashu District, Kaohsiung City 84001, Taiwan, R.O.C.
ci716131@gmail.com
[b] Department of Information Management, I-Shou University,
No.1, Sec. 1, Syuecheng Rd., Dashu District, Kaohsiung City 84001, Taiwan, R.O.C.
wuyulung@isu.edu.tw
[c] Department of Information Engineering, I-Shou University,
No.1, Sec. 1, Syuecheng Rd., Dashu District, Kaohsiung City 84001, Taiwan, R.O.C.
gracewine8@gmail.com

* Corresponding author

Abstract

The police are aimed at promoting the common interests of society and preventing harm. The daily life of the population is closely related to the police service. Due to the lack of an appropriate quality of service scale for the police. Therefore, this study is based on the service quality evaluation model. Then Combined with the collection of public service quality assessment assessment scale to discuss the construction and verification of the quality dimension and scale of police agency. The results showed six quality dimensions of tangible, reliability, responsiveness, assurance, empathy, and promptitude extracted from 34 questions to be key factors affecting the service quality of the police. Finally, the study puts forward the meaning and suggestions of practice and management.

Key words : Police Department, Service Quality, Dimension, Scale.

1. Introduction

Customer satisfaction has been the greatest driving force for the service operators to promote the

service quality. It has also prompted many scholars to put forward relevant research on "quality of service" and "customer satisfaction". At the same time, the service quality this trend is gradually spreading to the public sector. With the evolution of democratic politics and the improvement of democratic literacy, the people's demand for the efficiency of state administration has also been raised.

And its effectiveness or not affects state's competitiveness even more. Many countries have also put forward public service quality plans. Judging from past experience, the police play an important role in the public sector. The daily life of the population is closely related to the police service. Therefore, the Police Department in Taiwan has been implementing police agencies ISO (International Organization for Standardization) quality management system since 2001. Establishing standard operating procedures for receiving people's business to improve service quality and increase administrative efficiency. Further improve public satisfaction with police services.

But in academic research, there is little literature on promoting the quality of police services. Therefore, in order to fill the academic research deficiencies and provide the practical application of the police, and it also inspired the motivation of this study.

This study is based on the SERVQUAL、E-SERVQUAL service quality evaluation model. And combined with the collection of public service quality assessment scale and enterprise service quality assessment scale to discuss the construction and verification of the quality dimension and scale of police department, In order to construct a stable, systematic and comprehensive police service quality evaluation scale, Then testing and exposing the content factor structure of service quality assessment scale to provide follow-up research models for use.

2. Literature Review

2.1 SERVQUAL Service Quality Model

Parasurman, Zeithaml & Berry (1985) organized information on the service quality, They were believed that the measurement of service quality should be measured from the customer's point of view, rather than judging from a corporate point of view. And it has three characteristics: intangible, heterogeneity and indivisibility. However, the definition of quality is difficult to reach a consensus and ambiguous. For this reason, Parasurman, Zeithaml and Berry proposed the Service Quality Model (a.k.a. the "PZB Service Quality Model"). According to this conceptual model, the SERVQUAL scale has been developed [1]. And gradually to amend and develop [2-6] Therefore, it is the most well-known and widely used of the relevant measurement tools.

But the scope of application of the PZB Service Quality Model and SERVQUAL scale more belong to the traditional brick-and-mortar stores. Therefore, some scholars have also suggested that SERVQUAL scale should be modified according to different industries and characteristics [4, 7 &8]. In addition, Brown, Churchill & Peter have comments on the SERVQUAL scale. They suggested that directly measure the gap between the customer's perception service and the expected service to establish a scale of Non-Difference that based on a non-differentiated service

quality measurement method [9].

2.2 E-SERVQUAL

Zeithaml, Parasuraman & Malhotra are based on the previously proposed PZB Service Quality Model and the SERVQUAL scale, then redefining the service quality from the virtual store on the network becomes the ZPM website service quality model. They proposed E-Service Quality (acronym E-SQ) to define the extent to which the site's service quality facilitates the efficient and effective delivery of the site's products or services. Later, they developed seven dimensions that affect the service quality of the website represently, including efficiency, reliability, completion, privacy, responsiveness, compensatory and contact in 2002. And they was based on website to put forward the ZPM website service quality model, which is different from PZB Service Quality Model, which is based on the traditional industry [11].

Parasuraman, Zeithaml & Malhotra (2005) provided the most comprehensive results for the website services quality. They evaluated the service quality of online suppliers with a multi-item scale (E-S-QUAL) empirical test. The result is in conformity with exploratory studies, that must be used two different scales to measure the of the website services quality. E-S-QUAL scale have proposed core of service quality, including four quality dimensions (efficiency, performance, system effectiveness and privacy). In addition, the E-S-QUAL scale is suitable for "unusual contact" when shopping online, such as product return and handling issues. The E-S-QUAL scale consists of three quality dimensions (quick response, compensation, and contact) [12].

Due to the convenience of the Internet, enterprise must use the Internet to establish two-way communication channels with consumers in order to grasp and meet consumer preferences and needs. Because the public sector in response to the democratization process to pull into the relationship with the people, the establishment of the website of the organ has become an inevitable trend, and it also in line with the needs of the people. The network service quality is also valued. On the other hand, Because Parasurman, Zeithaml & Berry have proposed the Service Quality Model since 1985. It has been after more than 30 years of testing, all the way to the E-S-QUAL scale. Its theoretical structure and development scale has been quite mature, and the construction process is also quite rigorous. Therefore, this study aiming at the characteristics of the police organ tries to construct the service quality scale of the police organ according to the development steps and methods of the scale.

2.3 PolQUAL

In the study of the service quality of the police, academics such as Cláudia, Luís & Ferreira, etc. have built a scale of people's quality assessments in 2003 for use in the field of police service work. The revised SERVQUAL method is used to adjust and apply police traffic services in Portugal. The reliability and effectiveness of the proposed data will be assessed against the relevant information collected by telephone interview over a three-month period. The results found that tangibles, reliability, responsiveness, assurance, empathy, and promptitude were the

six key dimensions. At the same time, it is pointed out that with the improvement of driving education level, the quality of perceived service will decline. In addition, people often do not choose to interact with police services, but in a democratic society, good service quality is essential to maintaining confidence in police services [13].

In 2006, academics such as Mike, Neil, Russell and Edward designed questionnaires with five dimensions of SERVQUAL, and selected representatives from the areas serviced by Scotland's Strathclyde Police to conduct survey visits. The survey documented respondents' expectations for good police service. It also compares the views of Strathclyde Police on the services provided to check the police's understanding of public expectations and how its internal processes support the provision of high-quality police services. The study found that while there were serious deficiencies in satisfired public expectations, the police seemed to know exactly what those expectations were. There are also gaps in the ability of the police to be satisfired with established standards and the level of service provided to the population [14].

Jhu,Chun-Kuei & Shen,Lan (2009) understood the expectations and perceptions of police service quality among police station leaders, grassroots police officers and residents of the district by way of questionnaires to the grassroots police station of Shanghai Municipal Public Security Bureau as the research object. And discussed the infiuence of five dimensions on the police service quality in the SERVQUAL scale of PZB model. The results show that there is a significant positive correlation between the five dimensions that affect the police service quality in police stations. According to this, they proposed to strengthen the function of police station service and reduce the gap of service quality to construct the countermeasure suggestion that the police service quality management system of the public-service-oriented [15].

It can be found here that the research dimensions of the police agency service quality scale developed by the above scholars are based on the traditional SERVQUAL scale. But it must be considered that the characteristics of the police are different from enterprise that is generally for-profit. In addition, the police now also use the characteristics of network-type delivery services to modify part of the dimensions of the scale to apply to the website service. However, its evaluation dimensions are not consistent with the SERVQUAL scale. The modified dimensions must also face the test that the nature of the dimensions may have changed. Therefore, it is necessary to establish a suitable service quality assessment dimensions for the service characteristics of police agency.

Although it is in the position of mainstream application in academic. But there are also many scholars who question and challenge their views, Parasurman, Zeithaml & Berry also responded and revised their scales to accommodate new applications. It is also because they have proposed the concept model of service quality since 1985. It has been after more than 30 years of testing until the E-S-QUAL scale. Its theoretical structure and development scale has been quite mature,

and the construction process is also quite rigorous. Therefore, this study tries to build the service quality scale of the blog site according to the development steps and methods of the scale.

3. Research Method

Because this study is the construction and verification of the service quality dimensions and scale of the police angency. This study discusses dimension and scale of SERVQUAL, E-SERVQUAL and PolQUAL first. In addition to collecting other industry and public sector quality assessment scale. To make the scale more applicable, valid samples are divided into two groups. The first group is the calibration sample, and the second group is the criterion sample. First do the first group of calibration sample related statistical analysis, and then the second group of criterion sample and the first group of calibration sample do the utility extension analysis. In the group analysis, it tests the applicability including the police personnel, the public and the overall (including police personnel, the public) service quality assessment to construct a quality assessment scale for the service quality of police organs. This study architecture model, as shown in Figure 1.

According to dimensions and scale of SERVQUAL, E-SERVQUAL and PolQUAL, this study explores the evaluation service quality scale suitable for police organs, and combines with the collection of other industry and public sector service quality assessment scale to develop 64 questions of the police service quality assessment scale prototype. Next, 9 professors and experts were interviewed to make recommendations on the questionnaire, which was re-grouped into a 57-question pre-test questionnaire.

This study selected 50 first-line field police officers of Kaohsiung City Police Department to conduct pre-test questionnaires. The questionnaire was recycled, of which 4 were invalid and 46 were valid. The factor analysis is analyzed by the Principal Component method to extract the factors, and rotated with Varimax Method. The Eigenvalue was 1 as the factor filtering criterion, and deleted the questionnaires of the Factor Loading less than 0.5. First factor analysis was 21 questionnaires deleted, and keeps 36 questionnaires. Then doing the second time factor analysis, there were 1 questionnaire classified into two factors at the same time and 1 questionnaire Factor Loading less than 0.5 recommended to delete. A total of 2 questions were deleted and 34 questions were keep.

< insert Figure 1 about here >

4. Case Analysis

In this study, the questionnaire link was transmitted by google form through communication software such as Line. People who have received a link to the questionnaire are kindly requested to help fill out the questionnaire. Questionnaires recycled through google forms found that the majority of people who filled out the questionnaires were concentrated in urban areas; the security of densely populated areas is less stable than that in the less populated areas, so the

people's dependence on the police is relatively heavy and the requirements are higher, which is of higher benefit to this study. After recycling and organizing a total of 426 questionnaires, and then deducting 29 invalid questionnaires, the effective questionnaire was 397, and the effective questionnaire recovery rate was 93.19%.

The second part of the questionnaire is the significant level of the overall construction and verification questionnaire of the service quality of the police agency. It can be checked with KMO (Kaiser-Meyer-Olkin) and Bartlett. The KMO evaluation value must be greater than 0.8, and the Measure of Sampling Adequacy of result is 0.976. The Bartltett's Sphericity Test is significant 0.000. It means that the data is suitable for Exploratory Factor Analysis (EFA). In addition, the Cronbach's alpha of each dimension is greater than 0.9. It indicates consistency within each dimension.

The factors of each dimension question are analyzed by Confirmatory Factor Analysis, including the estimator of the Factor Loadings Significance, Question Reliability, Composite Reliability & Convergent Validity Analysis (as shown in Table 1). Its z-value greater than 1.96(Unstd/S.E.) indicates that the question is significant, Standard Deviation (STD) greater than 0.6, Squared Mutiple Correlations, (SMC) greater than 0.36 is acceptable, and greater than 0.6 is moderately correlated, composite reliability (CR) are greater than 0.7, Average Variance Extracted (AVE) are greater than. It indicates that the model of measurement has Effect Validity。

< insert Table 1 about here >

Figure 2 shows the second-order factor model. The so-called second-order factor model refers to each dimension in the model is related to each other, in addition to the dimension and the question to do related testing, but also to do related testing of the dimension and dimension. This dimensions and questions contain 8 questions of tangible, 6 questions of reliability, 6 questions of empathy, 4 questions of responsiveness, 4 questions of assurance and 6 questions of promptitude. The path coefficient of the second-order factor model service quality dimension to each dimension is between 0.82 and 0.89. The interpretation ability of each dimension facing the service quality dimension is between 0.64 and 0.81. In second-order factor model, there are 6 path coefficient testing between the service quality dimension and each dimension.

Finally, the service quality scale of the police agency contains 6 dimension question, reliability (6), responsiveness (4), empathy (6), assurance (4), tangible (8) and promptitude (6). The details are shown in Table 2.

<insert Table 2 about here>

< insert Figure 2 about here >

5. Conclusions

This study is for the development of the service quality scale of the police agency. The initial scale prototype was 64 questions, which were modified to 58 questions by expert interviews. After that, it is analyzed by questionnaire pre-test, exploratory factors and verification factors.

After questionnaire pre-test, Exploratory Factor Analysis and Confirmatory Factor Analysis, Finally, the questionnaire were modified to 58 questions and can be summed up 6 dimensions, including reliability (6), responsiveness (4), empathy (6), assurance (4), tangible (8) and promptitude (6). This scale development is after factors analysis many times. It is step by step and very rigorous. It also shows that the service quality evaluation scale of this study is applicable to the use of service quality evaluation of police agency.

In the course of research, it is found that the people's demand for service quality is endless, good and better. Coupled with the rise of democratic consciousness, the public's enthusiasm for politics, and the resort to the media and representatives of public opinion will all affect the question of the service quality of the police. Of concern here is the time limit for the use of the police service quality scale. In other words, it is a matter of concern that the police service quality scale of this study will be restricted in their use in the face of changing times. Therefore, the police service quality will keep pace with the times; the service quality of the police service must be assessed at all time and replaced. It is expected that successors will regularly update service quality scale of the police for reference by the police agency in order to enhance service quality of the police.

References

[1] Brown, T. J., Churchill, G. A. Jr. & peter, P. (1993). Research note: Improving The measurement of service quality. *Journal of Retailing,* 69(1), 127-139.

[2] Cláudia, S. S., Luís, M., Ferreira D.F., & Luís F. C. S. (2003). POLQUAL-measuring service quality in police traffic services, International Journal of Quality and Service Sciences, 5(3), 275-289.

[3] Jayasuriya, R. (1998). Measuring service quality in IT services: Using service encounters to elicit quality dimensions. Journal of Professional Services Marketing, 10 (1), 11-23.

[4] Jhu, Chun-Kuei & Shen-Lan (2009). Study on Service Quality of Police Substations Based on PZB Model, Journal of Gansu Institute of Public Administration, 1, 46-54.

[5] Losa, S., Chandon J. L., & Chiara O. (1998). An emprical study of SERVQUAL's dimensionality. Service Industries Journal, 18 (2), 16-44.

[6] Mike D., Neil J. K., Russell R., & Edward M. S., (2006). Assessing the quality of police services using SERVQUAL Policing. An International Journal of Police Strategies & Management, 29(1), 92-105.

[7] Parasuraman, Valarie A. Zeithaml, & Leonard L. Berry (1988a). Communication and Control Processes in the Delivery of Service Quality. Journal of Marketing, 52(2), 35-48.

[8] Parasuraman, Valarie A., Zeithaml, & Leonard L. Berry (1988b). SERVQUAL A Multiple-Item Scale for Measuring Consumer Perceptions of Service Quality. Journal of Retailing,

64(1), 35-48.

[9] Parasuraman, Valarie A., Zeithaml, & Leonard, L. Berry (1991). Refinement and Reassessment of the SERVQUAL Scale. Journal of Retailing, 67(4), 420-450.

[10] Parasuraman, A., Zeithaml V. A., & Berry, L.L. (1985). A Conceptual Model of Service Quality and Its Implications for Future Research. Journal of Marketing, 49 (4), 41-50.

[11] Parasuraman, A., Zeithaml, V. A. & Berry, L. L. (1994a). Reassessment of expectations as a comparison standard in measuring service quality: implications for further research. Journal of Marketing, 58(January), 111-124.

[12] Parasuraman, A., Zeithaml, V. A. & Berry, L. L. (1994b). Alternative scales for measuring service quality: A comparative assessment based on psychometric and diagnostic criteria. Journal of Retailing, 70(3), 201-230.

[13] Parasuraman, A., Zeithaml, V.A. & Malhotra, A. (2005). E-S-Qual: a multiple-item scale for assessing electronic service quality. Journal of Service Research, 7 (3), 213-233.

[14] Zeithaml, V. A., Parasuraman, A. & Malhotra, A. (2000). e-service Quality: Definition, Dimensions and Conceptual Model. Working Paper, Marketing Science Institute, Cambridge, MA.

[15] Zeithaml, V. A., Parasuraman, A. & Malhotra, A. (2002). Service Quality Delivery through Web Sites: A Critical Review of Extant Knowledge. Academy of Marketing Science, 30 (4), 362-375.

Table 1 dimension question, Question Reliability, Composite Reliability and Convergent Validity Analysis

Dimension	Que	the estimator of the Factor Loadings Significance				Question Reliability		Composite Reliability	AVE
		Unstd.	S.E.	z-value	P	Std.	SMC	CR	AVE
Tangible	A1	1.000				0.873	0.723	0.831	0.607
	A2	1.016	0.068	16.400	***	0.753	0.587		
	A3	1.032	0.059	18.498	***	0.898	0.799		
	A4	0.953	0.069	12.963	***	0.637	0.442		
	A5	1.027	0.053	17.291	***	0.871	0.743		
	A6	0.964	0.072	13.473	***	0.679	0.463		
	A7	1.012	0.067	15.855	***	0.742	0.573		

Dimension	Item								
	A8	1.001	0.059	14.600	***	0.713	0.527		
Reliability	A9	1.000				0.674	0.453	0.911	0.701
	A10	1.418	0.101	13.708	***	0.827	0.719		
	A11	1.401	0.093	14.126	***	0.898	0.813		
	A12	1.320	0.098	13.903	***	0.871	0.789		
	A13	1.301	0.087	13.107	***	0.811	0.701		
	A14	1.428	0.103	13.908	***	0.857	0.734		
Empathy	A15	1.000				0.743	0.556	0.846	0.615
	A16	1.139	0.073	15.206	***	0.812	0.686		
	A17	0.965	0.068	15.007	***	0.782	0.581		
	A18	0.947	0.062	14.574	***	0.722	0.538		
	A19	1.142	0.076	15.437	***	0.832	0.696		
	A20	0.993	0.072	15.194	***	0.792	0.631		
Responsiveness	A21	1.000				0.788	0.646	0.931	0.698
	A22	1.088	0.063	18.667	***	0.881	0.751		
	A23	0.963	0.059	15.278	***	0.776	0.598		
	A24	1.134	0.068	18.982	***	0.892	0.799		
Assurance	A25	1.000				0.925	0.862	0.941	0.865
	A26	0.996	0.034	32.551	***	0.956	0.899		
	A27	0.972	0.031	31.441	***	0.932	0.865		
	A28	1.044	0.036	29.932	***	0.918	0.834		
Promptitude	A29	1.000				0.835	0.705	0.906	0.753
	A30	1.129	0.052	23.363	***	0.932	0.863		

A31	1.086	0.050	22.963	***	0.915	0.831
A32	0.963	0.062	14.132	***	0.681	0.456
A33	1.089	0.052	23.673	***	0.919	0.843
A34	1.081	0.049	21.873	***	0.911	0.821

***p<0.001

Table 2 The service quality scale of the police agency

Question Number	Reference dimension
a1. The location of the police is convenient.	Tangible
a2. The police have barrier-free spaces (facilities).	
a3. The police have clear signs that are easy to identify.	
a4. The police are convenient for parking.	
a5. The location of the police facilities is clearly indicated.	
a6. Books, newspaper and magazines are provided.	
a7. Overall lighting.	
a8. The temperature of the air conditioning system is adjusted.	
a9. The police have clearly marked or informed the relevant standard operating procedures.	Reliability
a10. The police will explain the application and service cases in detail to the public.	
a11. The police do job well of service at once.	
a12. After accepting the application for a case, the police can complete it within a certain time limit.	
a13. The police will clearly inform the review of the correction or the results.	
a14. The police will inform the public of the true content of the service.	
a15. The police maintain a willingness to serve the public.	Empathy
a16. The police will provide relevant information explicitly.	
a17. The police can control the mood properly.	
a18. The police are willing to take the initiative to serve the people.	
a19. The police have the expertise to answer people's questions.	
a20. The police provide equal treatment to the public.	
a21. The police can provide services to the public immediately.	Responsiveness
a22. The police have clearly informed the follow-up process after	

accepting each case.	
a23 The police are actively adopting public advice to improve services.	
a24. The police can provide diverse and innovative services such as online application.	
a25. The police provide appropriate equipment and technical support to improve the police services quality.	Assurance
a26. The police will recommend the purchase and replacement of old police hardware and software equipment.	
a27. The police hardware and software equipment, in line with the actual needs of police work.	
a28. Combined with the private enterprise software and hardware functions to save money and expenditure to improve the overall effectiveness of police equipment.	
a29. Your overall satisfaction with the police service equipment.	Promptitude
a30. The police can answer the phone quickly.	
a31. The police can get to the scene of the case quickly.	
a32 The hardware and software facilities required for police service and operation can be updated in real time to meet the needs.	
a33. The police have established a mobile dispatch communications mechanism. (Quick Combat Crime SWAT Team)	
a34. Your overall satisfaction with the promptitude of the police.	

| Exploring the literature of Service quality 1. SERVQUAL dimension and scale 2. E-SERVQUAL dimensions and scale |

| 1. Collecting other industry and public sector quality assessment scale 2. The assessment scale of the police service quality that developed by the researchers |

| Developing the assessment scale of the police service quality Questionnaire prototype Experts Interview Questionnaire modify Pre-test questionnaires Questionnaire modify Questionnaire survey |

| Measures Sample (building model) statistical analysis |

| Criterion Validity Sample (validate model) statistical analysis |

| Combining Measures Sample with Criterion Validity Sample (Validate Model) Statistical analysis |

| The police personnel, the public and the overall service quality Statistical |

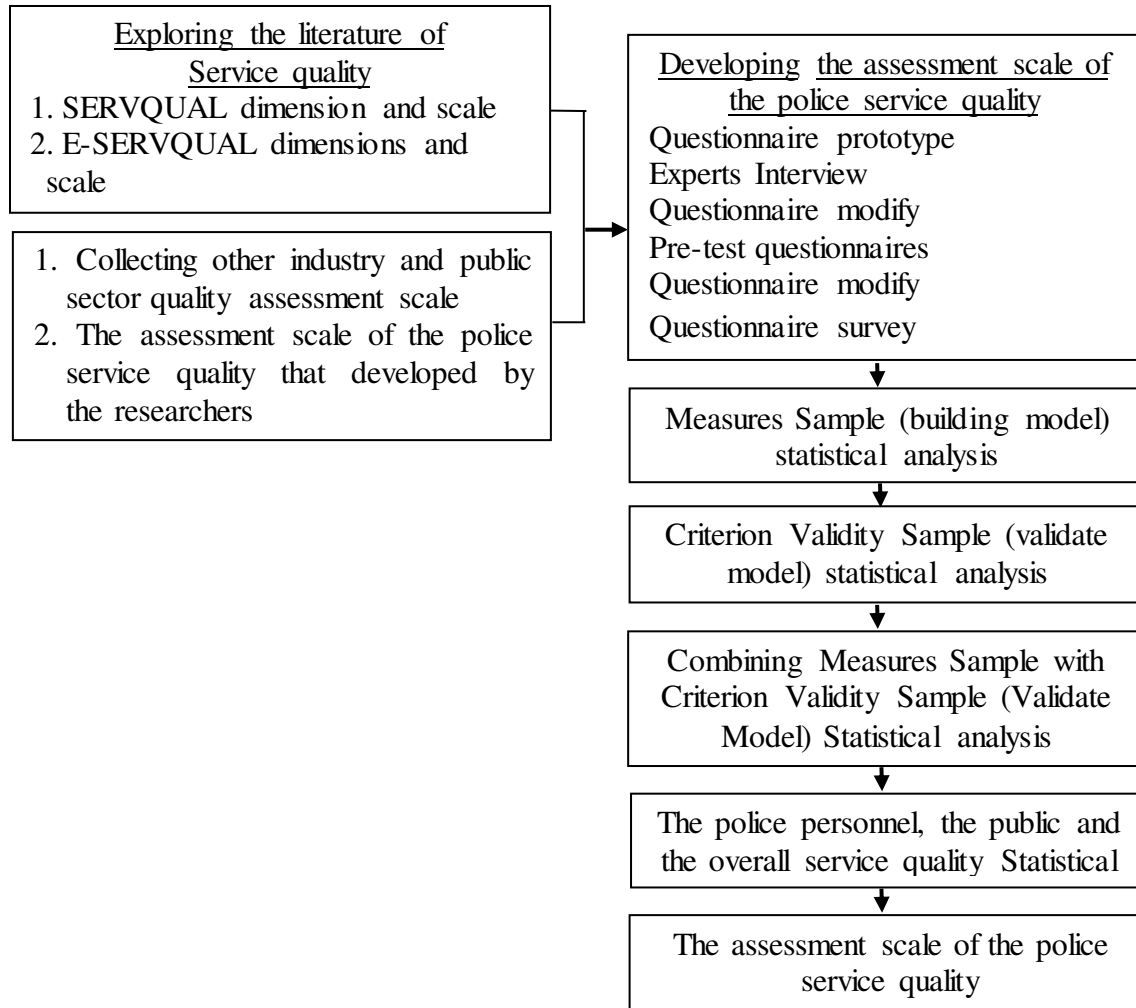| The assessment scale of the police service quality |

Figure 1 The Study Architecture Model

Figure 2 Models 4 (The Second-Order Factor Model)