

MARITIME TRANSPORTATION QUALITY EVALUATION FOR PENANG ISLAND, MALAYSIA

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Abstract

The purpose of this study is to calculate the level of service quality for Penang Island ferry services and to suggest the improvement in order to enhance the Penang Island ferry services. This research paper focuses on the services quality level of ferry transportation crossing between Butterworth to George Town using SERVQUAL approach from a survey that carried out in the Penang Island. The quantitative method was used in this research. Using SERVQUAL model analysis, the researchers documented how both the perception and expectation of ferry users rate the importance and their current satisfaction with a number of service aspects concerning Penang Island ferries. Tangible, Empathy, Assurance, Responsiveness and Reliability are the five dimensions which have been carried out to evaluate elements that reflect the customer's perception of service quality. Sufficient capacity, comfortable facilities, and fares are rated as highly important elements in services quality but providing a lower level of satisfaction by both the pedestrians and vehicles respondents. From the results of the survey, the research can be concluded that special attention especially for the elements that get lower level of satisfaction must be carried out so that improvement can be done to enhance the services provided by Penang Island ferry.

Keywords-- SERVQUAL, Service Quality, Maritime Transportation.

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INTRODUCTION

Penang Ferry transportation which runs between Butterworth on mainland Malaysia, to Georgetown on Penang Island since 1894 was the first operated ferry transportation that were run by Penang Port Sdn Bhd (PPSB) in 1924. However in 2017, Prasarana Malaysia Berhad, took over Penang Ferry from Penang Port Sdn Bhd (PPSB) and rebranded the ferry as Rapid Ferry. This research uses the SERVQUAL instrument as a tool to perceive and analyze the services quality level of ferry transportation provided to customer by Rapid Ferry. After analyzing the data obtained from the questionnaire the end result will enable the researchers to evaluate the customer's perception and satisfaction of the ferry services.

LITERATURE REVIEW

Quality Services in Ferry Transportation

Ferry transportation is a public transport that carries passengers, cargo and vehicle that use the waterways such as oceans, rivers or bays for short and long distance. According to the Public Transport by Ferry (2014), a ferry is as a boat that is designed to move people and goods across the water from one point to another (NZ Transport Agency, 2014). While, Interferry (2017), stated that a ferry is a vessel used to transport passengers and/or vehicles across a body of water on a regular, frequent basis and can range from small boats carrying passengers across a harbor, lake or river, to large sea-going ships.

Besides that, according to Laird (2012, (as cited in Syafruddin Chan, 2017) stated that the ferry transportation has an

important role in the transport system for many coastal cities, making direct transit between the two destinations with a smaller cost than a bridge or tunnel. So, it is possible to say that a ferry is a mode of transportation connecting two places that can carry passenger or vehicle across the sea or ocean at specific route.

Quality Service Elements of Public Transport

The perceptions of passengers on public transport quality services may depend towards the elements of perceived in transport services. According to Kerkko Vanhanen et al., (2005), if the satisfied passengers perceive the service as good, it also shows that the quality of the public transport service they received is also good. Furthermore, from the literature review, the researchers were able to find the importance elements of perceived in transport services. According to Tyrinopoulos (2014) and Hussain et al., (2017) in Analysis of Passengers' Perception of Public Transport Quality and Performance, the analysis demonstrated the most important satisfaction attributes are service frequency, followed by waiting conditions and network coverage, punctuality and in-vehicle transport conditions. Likewise, the awareness of quality improvements in a given sector may increase expectations with regard to other factors impacting on perceived total quality (Friman, 2004 as cited in Kerkko Vanhanen et. al., 2005).

The Gronroos Model

Gronroos (1984), one of the leaders in the Nordic school of thought with regard to the service literature, states that a proper conceptualization of service quality should be customer-

based. He also stated that the customer judges the quality and his/her perceptions create an image of good or bad quality (citation). This statement is supported by Gronroos (1988), while Gronroos (1982, as cited in Gi-Du Kang, 2006), noted that the quality of a service as perceived by customers has two dimensions which are a functional (or process) dimension and a technical (or outcome) dimension. In addition, the basic principle in his model is that service quality is dependent on the comparison of two variables, namely the expected service from customers and the actual service as perceived by them (Gronroos, 1984). According to Gronroos (1982, as cited in Gi-Du Kang et al, 2004), the model should include three more dimensions which are technical, functional, and image.

Hierarchical Model

The hierarchical model is defined as a model in which lower levels are sorted under a hierarchy of successively higher-level units. According to Tutorials Point in Hierarchical Database Model (2018), a hierarchical model represents the data in a tree-like structure in which there is a single parent for each record. This model structure allows the one-to-one and a one-to-many relationship between two or various types of data. The hierarchical structure is used as the physical order of records in storage. One can access the records by navigating down through the data structure using pointers which are combined with sequential accessing.

SERVQUAL Model

SERVQUAL model was developed by Parasuraman, for the measurement of customer satisfaction on service quality. The model consists of ten components. SERVQUAL provides a technology to measure and manage service quality. In their 1988 work, these ten dimensions were reduced to five dimensions (Anantha Raj, 2014). The measurement scale is deployed annually, to allow for changes in the opinions held by the populace to be considered over time (Scottish Transport Statistics, 2014 as cited in Craig Morton et al, (2015). While, the SERVQUAL analysis is believed to be the most popular method to examine the quality of service (Frost & Kumar, 2001, as cited in Syafruddin, 2017). Zeithaml et al, (2009 as cited in Petzer & De Meyer, 2011) and Ghani et al., (2019) explain that consumers evaluate service quality according to five main dimensions which are reliability, responsiveness, assurance, empathy and tangibles. According to the Cavana et al., (2007 as cited in Syafruddin Chan, 2017) stated that the SERVQUAL is an instrument that could be used to fulfill the purpose of measuring perceived service quality from the customer's perspective in this industry. In other words, to get the data from customer's perception in services quality performance, the SERVQUAL instrument must be used to measure perceived service quality from the customer's perspective. Ultimately, the five dimensions of SERVQUAL that were used by customers to appraise the quality of services are reliability, responsiveness, assurance, tangibles, and empathy. This SERVQUAL model can also be implemented as improvement strategies to overcome the weaknesses of service.

METHODOLOGY

Research Design

The empirical study took place in Penang Island Malaysia, a state that offers an illustrative example of Maritime Transportation. In the Malaysian context, maritime transportation is governed by the Malaysian Marine Department and Malaysian Maritime Enforcement Agency. These agencies aim to enforce laws, saving lives and properties at sea in order to ensure the safety and security of Malaysian Maritime Zone (MMZ) and also to develop and implement systems pertaining to safety of navigation, safety of ships, management of seafarers, port facility security and conducting maritime training. Figure 1 shows the research design for this study while Figure 2 shows the flow and framework of this research. This quantitative study was conducted using SERVQUAL instrument consists of five main

dimensions which are tangible, reliability, responsiveness, assurance and empathy.

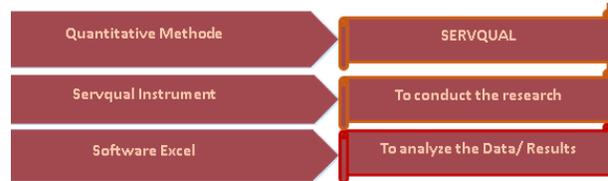


Figure 1. Research Design

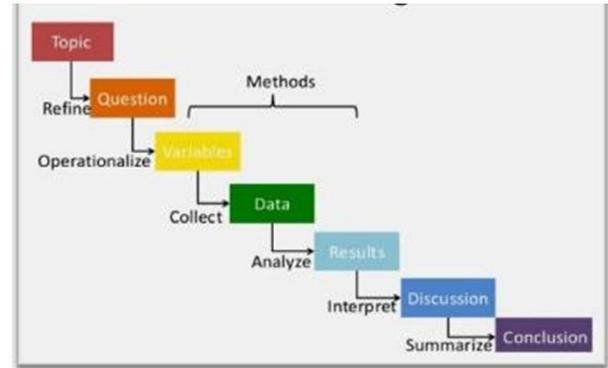


Figure 2. Research Flow

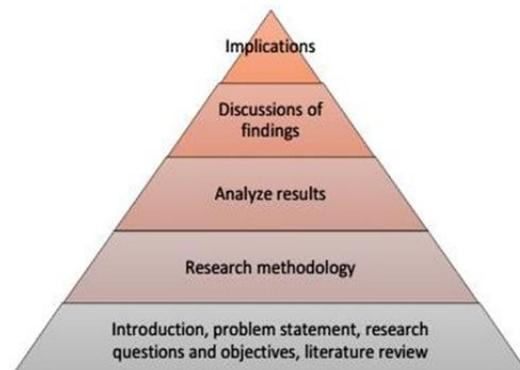


Figure 3. Research Framework

RESULTS AND DISCUSSION

Gap Score for Five SERVQUAL Dimension

The data in Figure 4 shows the result of five dimensions in SERVQUAL instrument that were represented by the 22 questions. The results summarized the quantitative findings by dimensions from the respondents' responses through the SERVQUAL tool in the reverse bar chart. The results show all the items that are located below the zero (0) line on the y-axis indicates dissatisfaction in the progressive performance.

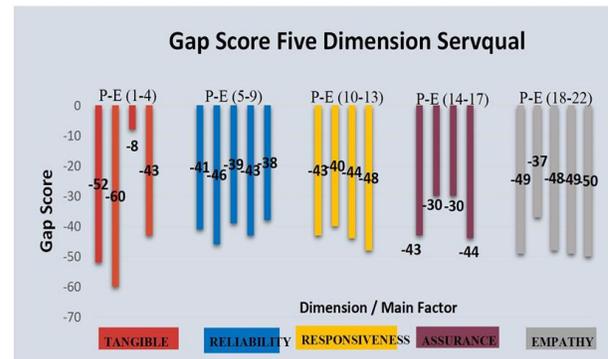


Figure 4. Gap Score for Five Dimension of SERVQUAL

Tangible Dimension

Table 1 is used to show the result of gap score between perception and expectation. Therefore, based on the result from all four items in tangible, it can be concluded that the huge gap

showed at item number 2. The lack of performance in virtual appealing of physical facilities by ferry transport services with mean score satisfaction was -1.2

Table 1. Tangible Dimensions Score

Main Factor	No	Items / Question Area	Perception (P)	Expectation (E)	Satisfaction/Gap Score (P-E)	Mean Score Perception (MP)	Mean Score Expectation (ME)	Mean Score Satisfaction (MP-ME)
Tangible	1	Modern looking equipment	190	242	-52	3.8	4.84	-1.04
	2	Virtually appealing of physical facilities	183	243	-60	3.66	4.86	-1.2
	3	Staff appearance	233	241	-8	4.66	4.82	-0.16
	4	Materials associated with the service visually appealing on ferry	200	242	-43	4	4.84	-0.84

Reliability Dimension

Table 2 shows the result of gap score between perception and expectation for reliability dimension. Based on the result from all five items in reliability, the research can be concluded that the

huge gap showed at items number 2 which is the lack of service performance in sincere interest to solve passenger problems. The mean score of satisfaction was -0.92.

Table 2. Reliability Dimension Score

Main Factor	No	Items / Question Area	Perception (P)	Expectation (E)	Satisfaction/Gap Score (P-E)	Mean Score Perception (MP)	Mean Score Expectation (ME)	Mean Score Satisfaction (MP-ME)
Reliability	1	Delivery promises	199	240	-41	3.98	4.8	-0.82
	2	Sincere interest to solve passenger problems	195	241	-46	3.9	4.82	-0.92
	3	Getting things done right the first time	206	245	-39	4.12	4.9	-0.78
	4	Provision of services at promise time	202	245	-43	4.04	4.9	-0.86
	5	Insistence of error-free records	208	245	-38	4.16	4.9	-0.74

Responsiveness Dimension

Table 3 represents the result from all four items in responsiveness. The researchers can conclude that the huge gap score showed at item number 4. Huge gap exists between

perception and expectation of -0.96 for item never be too busy to respond promptly towards customer requests. Thus, this contributes to customer's dissatisfaction.

Table 3. Responsiveness Dimension Score

Main Factor	No	Items / Question Area	Perception (P)	Expectation (E)	Satisfaction/Gap Score (P-E)	Mean Score Perception (MP)	Mean Score Expectation (ME)	Mean Score Satisfaction (MP-ME)
	1	Inform customers exactly when services will be performed	200	243	-43	4	4.86	-0.86
	2	Prompt services to customer	202	242	-40	4.04	4.84	-0.8

Responsiveness	3	Willingness to help customer	198	242	-44	3.96	4.84	-0.88
	4	Never be too busy to respond promptly towards customer requests	192	240	-48	3.84	4.8	-0.96

Assurance Dimension

Table 4 shows the result of gap score between perception and expectation for assurance dimension. Based on the result from all four items of assurance dimension, it can be concluded that the

huge gap showed at item number 4 is -0.88 mean score satisfaction which is the lack of knowledge to answer customer questions.

Table 4. Assurance Dimension Score

Main Factor	No	Items / Question Area	Perception (P)	Expectation (E)	Satisfaction / Gap Score (P-E)	Mean Score Perception (MP)	Mean Score Expectation (ME)	Mean Score Satisfaction (MP-ME)
Assurance	1	Instilling confidence behavior incustomer	198	245	-43	3.96	4.9	-0.94
	2	Feeling safe in dealing with employees	212	242	-30	4.24	4.84	-0.6
	3	Employees consistently being polite	213	243	-30	4.26	4.86	-0.6
	4	Knowledge to answer customers questions	200	244	-44	4	4.88	-0.88

Empathy Dimension

Table 5 shows the results of gap score between perception and expectation for empathy dimension. Huge gap score of -1

showed at item no.5 which is the lack of understanding specific needs of customers that lead to customer dissatisfaction.

Table 5. Empathy Dimension Score

Main Factor	No	Items / Question Area	Perception (P)	Expectation (E)	Satisfaction / Gap Score (P-E)	Mean Score Perception (MP)	Mean Score Expectation (ME)	Mean Score Satisfaction (MP-ME)
Empathy	1	Giving customer individual attention	197	246	-49	3.94	4.92	-0.98
	2	Operating hours convenient to all customers	208	245	-37	4.16	4.9	-0.74
	3	Giving customer personal attention	195	243	-48	3.9	4.86	-0.96
	4	Having customers best interest at heart	196	245	-49	3.92	4.9	-0.98
	5	Understanding specific needs of customer	194	244	-50	3.88	4.88	-1

SERVQUAL Score and Mean Score

Table 6 shows the total average score and un-weighted SERVQUAL score. The results showed the total average that sum up from all five dimensions which is -925 with mean score of -

18.54. The un-weighted SERVQUAL was -185 with mean score of -3.7. The numbers derived from the total average of five dimensions which are tangible, assurance, responsiveness, reliability and empathy.

Table 6. Calculation to Obtain Un-weighted SERVQUAL Score and Mean Score

No.	Dimension	Average Gap Score	Mean Score
1	Average Tangible SERVQUAL Score	-163	-3.24
2	Average Reliability SERVQUAL Score	-207	-4.12
3	Average Responsiveness SERVQUAL Score	-175	-3.5
4	Average Assurance SERVQUAL Score	-147	-3.02
5	Average Empathy SERVQUAL Score	-233	-4.66
Total Average		-925	-18.54
Average (Total / 5) Un-weighted SERVQUAL Score		-185	-3.7

Therefore, based on the results, it can be concluded that the negative results from the total average and un-weighted score which are -925 and -185 showed the quality services of Penang Island ferry transport is not in good situation. The huge negative gap exists in service quality shows the service quality performance is at the level of low satisfaction. This means that, the service quality performance ferry transport must undergo quality improvement process in order to improve their services and provide good service quality performance and improve customer's satisfaction.

CONCLUSION

This study achieved its objective which is to calculate the level of customer satisfaction towards services provided by the Pulau Pinang ferry transportation. The results of this study showed that passengers were not satisfied with the ferry services. The gap exists between services quality also shows that the expectations were higher than the perception of the service quality offered by the existing Penang Island ferry transportation in all aspects of SERVQUAL especially in empathy and tangible dimensions. Therefore, the research recommended that the Penang Island ferry services should improve their services in terms of empathy and tangible dimensions. The organization should also enhance their physical facilities services to customers and understand the needs and wants of consumers. Last but not least, suggestion for future research is to expand the SERVQUAL method analysis at other location such as at Langkawi ferry and Kota Kinabalu ferry. The research concludes that SERVQUAL can perceive the level of quality services provided to the customers and it is also able to help service firms identify areas of service weakness in order to implement improvement strategies. SERVQUAL may also be used to define the service quality standards that are measurable and transparent for Malaysian Maritime Transportation.

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REFERENCES

- Grönroos, C. (1984). A service quality model and its marketing implications. *European Journal of marketing*, 18(4), 36-44.
- Archakova, A. (2013). Service Quality and Customer Satisfaction. Case study: Company X.
- National Disaster Management Guidelines for Boat Safety, September 2017. New Delhi A publication of the National Disaster, Management Authority, Government of India.
- Essays, UK. (November 2013). SERVQUAL Model His Advantages and Disadvantages Marketing Essay. Retrieved from: <https://www.ukessays.com/essays/marketing/serv>

- Sharma, S. (2007). New mantras in corporate corridors: From ancient roots to global routes. New Age International (P) Limited, Publishers.
- Mathisen, T. A., & Solvoll, G. (2010). Service quality aspects in ferry passenger transport-examples from Norway.
- Ghani, A.B.A., Mahat, N.I., Hussain, A., Mokhtar, S.S.M. (2019). Water Sustainability In Campus: A Framework In Optimizing Social Cost. *International Journal of Recent Technology and Engineering*, 8 (2 Special Issue 2), pp. 183-186.
- Thian, W. J. (2012). Customer Satisfaction towards Services Quality of Public Transportation in Kuching Area, (Doctoral dissertation, Universiti Malaysia Sarawak).
- Alberquerque, E. (2013). The NZ Transport Agency's transport appraisal framework. *Policy Quarterly*, 9(4). doi:10.26686/pq.v9i4.4472.
- Suleiman, M. Pragmatic Analysis of Safety and Security in Tanzania Maritime Logistics: Evidence from Zanzibar Passenger Ferry Boat, Tanzania.
- Hussain, A., Mkpojiogu, E.O.C., Jasin, N.M. (2017). Usability metrics and methods for public transportation applications: A systematic review. *Journal of Engineering Science and Technology*, 12 (Special Issue 4), pp. 98-105.
- Kang, G. D., & James, J. (2004). Service quality dimensions: an examination of Grönroos's service quality model. *Managing Service Quality: an International Journal*, 14(4), 266-277.
- Chan, S. (2017). Assessing Service Quality of Passenger Ferry Services in Sabang Zone.
- Mathisen, T. A., & Solvoll, G. (2010). Service quality aspects in ferry passenger transport-examples from Norway.
- Shahin, A., & Samea, M. (2010). Developing the models of service quality gaps: a critical discussion. *Business Management and Strategy*, 1(1), 2.
- Vanhnen, K., & Kurri, J. (2007). Quality factors in public transport. Report of the Transport Research Program JOTU.
- Friman, M. (2004). Implementing quality improvements in public transport. *Journal of Public transportation*, 7(4), 3.
- Fellessen, M., & Friman, M. (2012). Perceived Satisfaction with Public Transport Service in Nine European Cities. *Journal of the Transportation Research Forum*, 47(3). doi:10.5399/osu/jtrf.47.3.2126
- Petzer, D. J., & De Meyer, C. F. (2011). The perceived service quality, satisfaction and behavioral intent towards cellphone network service providers: A generational perspective.
- Wu, H. (2013). An Empirical Study of the Effects of Service Quality, Perceived Value, Corporate Image, and Customer Satisfaction on Behavioral Intentions in the Taiwan Quick Service Restaurant Industry. *Journal of Quality Assurance in*

- Hospitality & Tourism,14(4), 364-390.doi:10.1080/1528008x.2013.802581.
21. Anantha Raj A. Arokiasamy. A Study on the Influence of Service Quality and Customer Satisfaction on Behavioral Intention in the Hospitality Industry in Malaysia [https://www.idosi.org/mejsr/mejsr22\(10\)14/1.pdf](https://www.idosi.org/mejsr/mejsr22(10)14/1.pdf).
 22. Jain, R., &Shu, Q. (2015). Critical Design Elements for Service Systems. Flexible Systems Management Managing Flexibility,21-28. doi:10.1007/978-81-322-2380-1_2
 23. de Oña, J., & de Oña, R. (2014). Quality of service in public transport based on customer satisfaction surveys: A review and assessment of methodological approaches. Transportation Science, 49(3), 605-622.
 24. Kristiansen, S. (2013). Maritime transportation: safety management and risk analysis. Routledge.