Article

The relationship between customer satisfaction and SERVQUAL Gap model, Beibu Gulf Ports Group as case

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Abstract: As a logistics organization, the service quality would be considered as one of the evaluating standards of its service. However, it appears with the customers' satisfaction. Customer satisfaction could be considered as a good way to attract the consumers in choosing and re-choosing such organization. To detect the service quality, SERVQUAL model would be a good choice because it starts from the expectation of the customers and the service perceived. It also divided into five dimensions as tangible, responsiveness, response, assurance, and empathy to test the service quality of an organization. In this model we can get the GAP of the service expectation and perceived in digital form then can find out the real service quality of the organization. Moreover, this research would use Beibu Gulf Port Group as the questionnaire participants (The customers who experienced the service of the group and the staff of the group). The model's result would show how the service quality of testing sample and then offer improving or maintaining suggestion on it.

Keywords: service quality measurement; Beibu Gulf Port Group; customer satisfaction; SERVQUAL Gap model

1. Introduction

1.1. Introduction of Beibu Gulf Port Group

Beibu Gulf Port Group, which was built in 2007, which is for directly managing the ports of Guangxi Zhuang autonomous regional government's ports for its operation, is a state-owned enterprise. Since this group was built, Guangxi government used it to offer the operation on the ports to handle the logistics operation of three main port cities which are Fangcheng, Beihai and Qinzhou. With the development of Association of Southeast Asian Nations (short as ASEAN in follow) and Regional Comprehensive Economic Partnership (short as RCEP in follow) agreement signed, the group has grown in the 357th of Top 500 Enterprises of China in 2016 (Introduction of Beibu Gulf Port Group, n.d.). And this group's main job is on the logistics operation and the also carring on the investing, industrial, energy, construction and financial service. In the year 2023, this group income reasearch 10.26 billion Chinese Yuan. And it also be responsible for the National Economic Strategic Platform for the economic developing. The staff of this group now is almost 30 thousand people. In 2021, the group's cargo throughput amount has over 3600 million tons, the containor handeling amout got the global position on world's 28th. Its logistics service now contains Chinese West part train and ship transportation, Liner, cold chain logistics, and internal transportation of Guangxi (alongside with Xijiang River Goldern Waterway). For this research, the service equals to the goods trade of the Beibu Gulf Ports Group.

With the development of modern economic world, Beibu Gulf Ports Group is

increasing the investment in the logistics service part of their task. And the customer satisfaction is their goal for further development in the next decades. With this precondition, Beibu Gulf Port Group starts to focus on the advanced service development by fulfilling the customers' demand.

1.2. The purpose of this research

Because the group's goal is to increase the competitive ability in the next decades, Beibu Gulf Port Group need to increase the service quality by improving the customer satisfaction to make the consumer choosing and rechoosing of this group. And the first step to increase the level of the customer satisfaction would be to fulfill the customers' demand.

To fulfill the customers' demand, the customer satisfaction would be one of the standards to achieve. And how to know the service reach the satisfaction of the customers will be a very significant step of the service setting. And the SERVQUAL Gap model would be a very good choose for this research to offer a clear understanding of the co-relationship between the service quality and the customer satisfaction.

2. Literature review and methodology

2.1. Customer satisfaction

For those who choose the certain service, the customers would be get the satisfaction from this service. How to understand the customer satisfaction? The customer provide money to get a certain service to fulfill whose desire to get pleasure from the service. Customer is the person who does the purchasing of the service or product and enjoy it, finally. To make them to buy the certain service satisfied is the way for the organization to achieve.

Customer satisfaction also be defined by other researchers as "the consumer's response to the evaluation of the perceived discrepancy between prior expectation and the actual performance of the product or service perceived after its consumption". (Tse and Wilton, 1988).

Customer satisfaction has also been defined by many other authors comes up with a product's perceived performance connect with the customers' former experience that in their minds (Kotler et al., 2002).

Satisfaction could be a person's emotional fulfillment or disappointment that results from comparing the behaviors of the service. Client happiness, which can be seen as a signal of customer satisfaction, is an has always been the most significant thing for any organization.

- Levy (2009) in his studies, suggested three methods to measure the customer satisfaction.
- A survey of customers feedback by transforming them into measurable quantitative data.
- Focus on groups or informal discussions orchestrated by trained professional moderator from customer concerned.
- Informal measure like reading public media or just communicate to the customers.
  Consumers satisfaction can also be a person's feeling with either the product or

service it is termed satisfaction. And the satisfaction can also be person's feeling of pleasure or disappointment that result from comparing a products' perceived performance or outcome with their expectation (Kotler and Keller, 2014). Schiffman and Karun (2004) raised customer satisfaction is defined as the individual's perception of the performance of the product or service in relationship to their expectation. In this precondition, the expectation from the customer and the service performance would be consider as the judgment standard of the satisfaction of the service performance. And the SERVQUAL Gap model would be one of the best measuring tools for the customer satisfaction. The customer's satisfaction could be considered as the standard to show the real service quality of an organization.

From Pangeiko Nautwima and Romeo Asa (2022), they investigating the link between the service quality and the satisfaction of the behavioral intentions in public sector and found out the importance of the customer satisfaction. Moreover, the service quality dimensions to evaluate service quality would be direct or indirect to customer satisfaction, they neither used all the variables of SERVQUAL but the basic five dimensions to check whether an organization's service quality. (Kuo, 2003, 461-473) Furthermore, the SERVQUAL model could be easily find out the gap of the service quality through the five different dimensions.

2.2. The SERVQUAL Gap model

The SERVQUAL (Service Quality) model is one of the most widely used methods for estimating customer satisfaction and service quality (Al-Momani, 2015). Moreover, as Parasuraman raised in 1985, service quality is associated to the perceptions from the organization staff and the expectation of the service receivers (Parasuraman et al., 1985). In other words, when the result from perceptions is over the actual expectation from the customers, it would make the customers satisfied in the service, and this service could be considered as an excellent service the organization offered (Vázquez et al., 2001). Which means the customer's satisfaction would be fulfilled in this service. Then the service quality could be divided into 5 dimensions which can be measured for evaluating the quality of it. And the 5 dimensions could be concluded as follow (Parasuraman et al., 1988):

- Tangible: Appearance of physical facilities, equipment, personnel, and materials;
- Responsiveness: Willingness to help customers and provide prompt service;
- Reliability: Ability to perform the promised service dependable and accurately;
- Assurance: Employees' knowledge and courtesy and their ability to inspire trust and confidence;
- Empathy: Caring, easy access, good/communication, customer understanding and individualized attention given to customers.

And the model could be shown as below **Figure 1**.
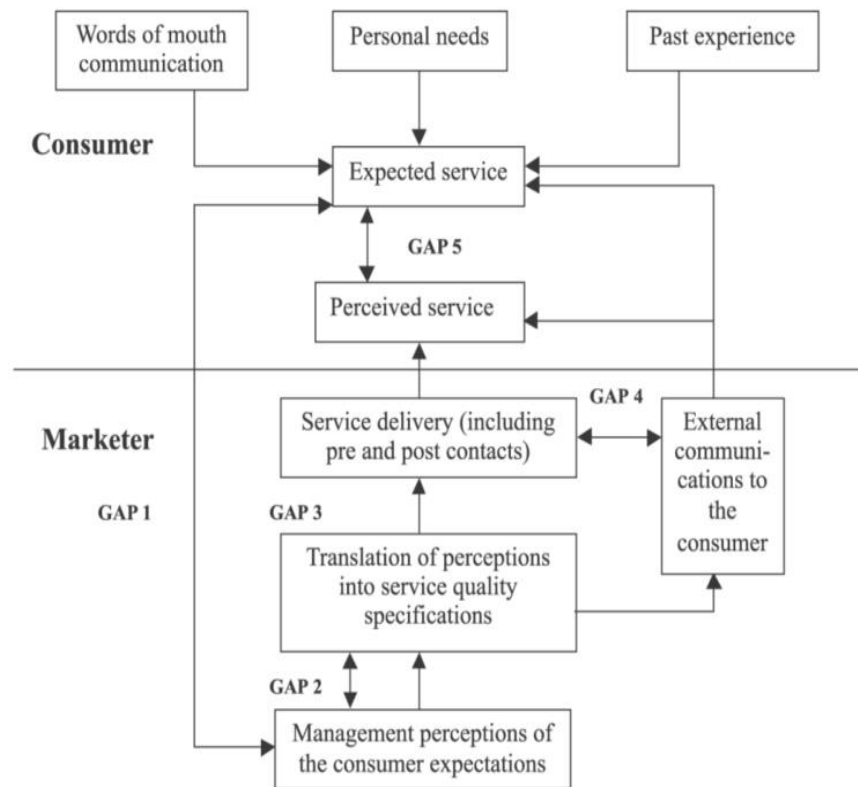
Figure 1. SERVQUAL GAP model.

The gap in this model is about the understanding of the service perceving and the customer expectation, which can be used to figure out the service quality. the SERVQUAL instrument is based on the 5 Gaps (Parasuraman et al., 1988). These gaps on the service provider's side, which can impede delivery of services that consumers perceive to be of high quality, are:

- Gap 1: Difference between consumer expectations and management perceptions of consumer expectations.
- Gap 2: Difference between management perceptions of consumer expectations and service quality specifications.
- Gap 3: Discrepancy between service quality specifications and the service delivered.
- Gap 4: Discrepancy between service delivery and what is communicated about the service to consumers.
- Gap 5: (Service quality) Gap 5 = f(Gap 1, Gap 2, Gap 3, Gap 4)—difference between consumer expectations and perceptions.

The gap model is used for checking the service quality and the customers expectation whether match or not. And from this model, this research will use the data which are collected from the questionnaire of the customers who experienced the service of Beibu Gulf Ports Group and staff from the group to do the comparation with the same questions to check the understanding of the service of the staff and what is the expectation of the customer. Moreover, to use this model to have a multi-criteria decision making could ease to find out for the complex comparing from both side that can get the clear data from this model. This is the way to check out the gap between the expected service and perceived service. The aim to compare the quality of

customer expectation with the service action understanding from the staff. To access the quality of service (Q) can be formulated as following:

$$Q = P - E$$

where the symbol stands as following:

Q: The quality of service;

P: Perceived service/understanding service from staff;

E: Expected service. And the range of the result is from $-1 < Q < +1$.

2.3. The hypothesis of this research

Hypothesis is a test criterion about the relationship between two or more events or concepts (Saunders et al., 2007). In this research the hypothesis would be related to the service quality and the customer satisfaction, so the hypothesis should as followings:

- H1: The Service Quality will affect the customer satisfaction by the SERVQUAL Gap Model five dimensions.
- H2: In Beibu Gulf Group, customer will be dissatisfied in assurance dimension.

The first aspect tangible is measured the infrastructure for tangible aspect, the first to the fifth item are from the physical aspects to detective the organization has a correct form of service delivery will be measured in the operation. The items could be a way to measure the level of the service quality in tangible aspects. Such as the port's staff's uniform, equipment, and so on. Which could be conduct with the physical form to check whether they are fulfill or not. And this dimension could be considered as the basic appearance of the organization. And it also could be considered as an observer factor that for the customer.

The second aspect is on the responsiveness, this part is detecting the staff behaviors and the organization operation will Express through eagerness to help customers and quickly resolve problems when errors or unexpected situations occur.

The third aspect is on the reliability, this part is about the accurate of the service delivery time and the consistent service ability of an organization, moreover the trusty building of an organization to the customers.

The fourth aspect is on the assurance of the service which express through ability to build the customer believing of the organization service on the communication skills and attentive attitude to do the best support to the customers.

The fifth aspect is empathy which is express through the style of the service from employee to the customers. In this aspect, the customer will be understood by the staff and the employees will create feelings of safety and long-term and repeating choosing of the organization that makes the effective of the organization operation.

While the H1 and the H2 got the common effect on the factor assurance. Then the co-relationship of the hypothesis would be one of the most considerable effects. The objectives of each item are based on the questionnaire to conclude the affecting effect on the port performance to conclude the co-relationship with the service quality.

Moreover, this questionnaire could be considered as the measuring tool of the data, it is detective the reality for the reliability the author will use a group of 100 random data for checking. Then there are six forces affecting the hypothesis and the model will be affecting the objectives to check the service quality will affecting the

Beibu Gulf operation, especially under the RCEP implementation. Then the data would be considered as the digital support of this study. And the goodness of the model as following **Table 1**.

Table 1. The goodness of model fitting.

Goodness of fit	Criteria	Results		Reference
Goodness of Fit Index (GFI)	≥ 0.95	0.966	Pass	Schreiber, Stage, King, Nora, and Barlow (2006)
Fit Goodness-of-Fit (AGFI)	≥ 0.95	0.955	Pass	Schreiber, Stage, King, Nora, and Barlow(2006)
Root Mean Square Error of Approximation (RMSEA)	≤0.05	0.040	Pass	Browne and Cudeck (1993)
Normed Fit Index (NFI)	≥ 0.95	0.953	Pass	Schumacker and Lomax (2004); Schreiber, Stage, King, Nora, and Barlow(2006)
Incremental Index (IFI)	≥ 0.90	0.966	Pass	Bollen (1989)
Tucker-Lewis (TLI)	≥ 0.95	0.959	Pass	Schreiber, Stage, King, Nora, and Barlow (2006)

2.4. Data collecting

And this research will follow the questionnaire as it can be seen in Appendix. For better understanding, the items will divide as following:

- Items 1.1–1.5 refer to Tangible (show as T1–T5 for the customer side and the ST1–ST5 for staff side in following);
- Items 2.1–2.5 refer to Responsiveness (show as R1–R5 for the customer side and the SR1–SR5 for the staff side in following);
- Items 3.1–3.6 refer to Reliable (show as L1–L6 for the customer side and the SL1–SL6 for the staff side in following);
- Items 4.1–4.4 refer to Assurance (show as A1–A4 for the customer side and the SA1–SA4 for the staff side in following);
- Items 5.1–5.4 refer to Empathy (show as E1–E4 for the customer side and the SE1–SE4 for the staff side in following).

The questionnaire finnally collected from the staff 1500 and 1500 from the customer side.

3. Results and discussion

3.1. The result of the questionnaire

For the research, the testing of the fitting is the mean result from this questionnaire shows as following (**Table 2**).

Table 2. SERVQUAL mean value.

Mean value			
Item	**Expectation Mean Value (*E*)**	**Perception Mean Value (*P*)**	**Gap Mean Value(*Q*)**
Tangible			
T1/ST1	3.622	4.075	0.453
T2/ST2	3.620	4.164	0.544
T3/ST3	3.623	4.139	0.516
T4/ST4	3.635	4.178	0.543
T5/ST5	3.644	4.161	0.517
Responsibility			
R1/SR1	3.627	4.190	0.563
R2/SR2	3.613	4.177	0.564
R3/SR3	3.633	4.155	0.522
R4/SR4	3.605	4.186	0.581
R5/SR5	3.611	4.203	0.592
Reliable			
L1/SL1	3.548	4.165	0.617
L2/SL2	3.592	4.191	0.599
L3/SL3	3.678	4.209	0.531
L4/SL4	3.659	4.217	0.588
L5/SL5	3.686	4.213	0.527
L6/SL6	3.651	4.211	0.560
Assurance			
A1/SA1	3..864	4.233	0.369
A2/SA2	3.857	4.212	0.385
A3/SA3	3.857	4.212	0.355
A4/SA4	3.848	4.204	0.356
Empathy			
E1/SE1	3.652	4.191	0.539
E2/SE2	3.684	4.195	0.511
E3/SE3	3.617	4.198	0.581
E4/SE4	3.635	4.216	0.581

3.2. Finding

With the result from the upper table, we can calculate the results are all positive, which means the service perceived from the group now is over the expectation of the customers. In other words, according to the result of SERVQUAL Gap model, the service of Beibu Gulf Port Group now is offering a good quality service to the customers who took part in this questionnaire. And the h1 has been answered, the service quality is over the customer expectation from the result table.

4. Discussion

As Zeithaml et al. (2006) stated, the service quality is a focused evaluation that

reflect the customers' perception of reliability, assurance, responsiveness, empathy and tangibles. According to the results from above table, the reliability value takes the highest gap in this questionnaire, which means that the customers who experienced Beibu Gulf Ports Group's service. The reason for this appearance the researcher because of Beibu Gulf Port Group has been working smoothly even in the Covid-19 period which makes the customer feel satisfied, and that is why the appearance of the questionnaire shows all positive. And the Reliable Gap mean value in the table got the highest point shows the reliable dimension in the customers who have experience in Beibu Gulf Port Group consider the service from the Group is the best feeling of the service, which means the service of the organization now is on the right way to make the customers' demand.

As a good service group, Beibu Gulf Ports Group puts its customers at the heart of everything it does. This means understanding their expectations, and going the extra mile to exceed those expectations. Effective communication, active listening, and personalized approaches are crucial for building strong customer relationships. Moreover, the staff of the group are having ongoing training and development opportunities to enhance their skills and knowledge. Empowering employees to make decisions and resolve customer issues promptly creates a sense of ownership and leads to more satisfied customers and employees. They would complete tasks as promised, and responds promptly to customer inquiries or concerns. Responsiveness demonstrates that the company values its customers' time and is committed to resolving any issues that arise. From the above mentioned, it shows in the SERVQUAL Gap Model as a good tangible, responsiveness, reliable, empathy and assurance dimensions. However, we still need to see the assurance aspect in this result table shows a little weaker than others. In other word, assurance of Beibu Gulf Ports Group needs to be enhanced.

5. Conclusion

This research shows the relationship of the customer satisfaction and the SERVQUAL GAP model have the relationship by the current data collected from the questionnaire. In the table of the questionnaire result, the positive digital shows the service which are satisfied. So there is no dissatisfied from the customers from the service. That means the hypothesis 1 of this research are positive and the hypothesis 2 is null. Which means in the recent situation, the service operated by the Beibu Gulf Ports Group make the customer satisfied and in a very good situation.

5.1. Suggestion

If an organization's SERVQUAL model mean values are all positive, which means customers' perceptions of service quality exceed their expectations across all dimensions measured by the model.

Given these positive mean values, here are some strategic suggestions for the organization:

1) Maintain and enhance strengths: Continue to invest in areas where customers perceive high quality. Regularly assess these areas to ensure standards do not slip over time.

2) Identify opportunities for excellence: Look for dimensions with the smallest positive gap. These could be areas where a slight improvement can lead to significant competitive advantage. In the assurance dimension, the group could put more attention than before to make the customer more comfortable than before.

3) Set new goals: Since customers' expectations might rise over time, set new, higher benchmarks for service quality. Aim to consistently surpass these elevated expectations.

4) Customer feedback loop: Establish a continuous feedback mechanism to monitor changes in customer expectations and perceptions. This will help in staying ahead of potential service gaps. And the group has been maintaining it well while the gap of empathy shows well.

5) Internal communication: Share these positive results with your employees to boost morale and reinforce the importance of their roles in delivering excellent service.

6) Innovation: Explore innovative ways to further differentiate your service offering, leveraging technology or unique customer experiences to create a stronger bond with customers.

7) Manage expectations: While positive gaps are good, overly high expectations can be difficult to sustain. Manage customer expectations through clear communication about what you offer, avoiding overpromising.

8) Train and develop staff: Invest in employee training and development programs to maintain and improve the skills that contribute to high SERVQUAL scores, especially in empathy and assurance dimensions. Especially in the assurance aspect of the group.

9) Segment-Specific analysis: Conduct a deeper analysis by customer segments to identify if there are specific groups whose expectations are not as well met, even though overall scores are positive.

10) Monitor competitors: Keep an eye on competitors' service offerings and customer feedback to ensure your positive gaps are not eroded by external factors.

Totally, maintaining a positive SERVQUAL score requires ongoing commitment and adaptation to changing customer needs and market dynamics. And the group now still needs to keep the good quality of service to make more benefit than before.

5.2. Limitation

This research is carried on the data which collected by the questionnaire from the customers who has experience with Beibu Gulf Port Group and the staff of the Group. There is a shortage of the data is not divided into very detailed classified varieties but a very rough experience. That would cause a limited evaluating course by only the feeling of the customers and the staff. It still makes a leakage of the process of proof.

Conflict of interest: The authors declare no conflict of interest.

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Appendix

Questionnaire

The Service Quality Evaluating Items of Beibu Gulf Port Group

5-very satisfy, 4-satisfy, 3-medium, 2-not very satisfy, 1-unsatisfy,

Your Age

Under 18	18–25	26–30	31–40	41–50	50–60	Over 60

Your Gender

Male	Female

	Expected Service					Perceived Service					Gap
1. Tangible	5	4	3	2	1	5	4	3	2	1	
1.1 The Group has enough modern machines and facilities to carry on service to the customers.											
1.2 The driver's dress up clean and tidy.											
1.3 The Group's vehicles, both inside the container and outside, are clean and sanitary.											
1.4 The Group can track the delivery status by a good system or other technique.											
2. Responsiveness	5	4	3	2	1	5	4	3	2	1	
2.1 The staff is willing to help customers out every time they are asked.											
2.2 When received the order, the staff will operate well on handeling the goods.											
2.3 Any unexpected or urgent orders will not make trouble to the staff.											
2.4 The staff is good at solving emergency problems and situations.											
2.5 The staff will not use 'I am too busy' as an excuse to refuse the customer.											
3. Reliability	5	4	3	2	1	5	4	3	2	1	
3.1 The Group's staff always provides services on-time and in the expected manner.											
3.2 The Group's staff delivers goods accompanied by an invoice.											

	5	4	3	2	1	5	4	3	2	1
3.3 The Group's staff accurately issues the correct order document with the cargo.										
3.4 The Group's staff informs customers the critical settled service period.										
3.5 The Group's staff can offer the service as they promised										
3.6 The Group's staff can deliver goods without flaws or damage.										
4. Assurance	5	4	3	2	1	5	4	3	2	1
4.1 The Group's staff makes customers feel stable when using offering ervice.										
4.2 The staff and drivers have proper manners when providing services and communicating with customers.										
4.3 The Group has a returning goods service and it is convenient and secured.										
4.4 The Group's staff can always answer the customer's queries because they know their duties very well.										
5. Empathy	5	4	3	2	1	5	4	3	2	1
5.1 The Group's staff will keep on remember the personal details for better service										
5.2 The Group always has activities to promote its long-term relationships with customers.										
5.3 The staff understands the customer's specific needs and difficulties.										
5.4 The Group has a flexible opening time for customers.										

Adopt from Min Li et al. (2015).