

# **SERVQUAL Model Application: Integration of AHP, Prioritization Matrix, and QFD in Assessing Various Delivery Courier Services in the Philippines**

**Kianna Denise C. Villapando, Alliah Jane S. Agunos,  
Anthony A. Sanchez, Leanne Dominique B. Loto and Rianina D. Borres**

Department of Industrial Engineering and Engineering Management  
Mapúa University  
Manila, Philippines

kdcvillapando@mymail.mapua.edu.ph, ajsagunos@mymail.mapua.edu.ph,  
aasanchez@mymail.mapua.edu.ph, ldbloto@mymail.mapua.edu.ph, rdborres@mapua.edu.ph

## **Abstract**

In the Philippines, the demand for delivery services has paved the way for the rise of various delivery companies. Hence, the competition among these couriers is increasing. In order for them to gain competitive advantage, their services must make a difference. The present study compared the customer satisfaction on the services offered by Philippine couriers based on the five SERVQUAL dimensions. Also, the couriers were ranked based on customer ratings through using Analytic Hierarchy Process. Furthermore, this research determined the specific dimensions and strategies which could help the couriers improve the quality of their service through using Prioritization Matrix and Quality Function Deployment. The data were collected through a survey distributed to 270 respondents within NCR. The AHP show that Gogo Xpress had the highest customer rating, and it was followed by Fastrack Courier Services, J&T Express and NinjaVan Philippines. Moreover, the prioritization matrix implied that Gogo Xpress had competitive advantages for all dimensions, Fastrack had advantage for assurance and reliability, while J&T Express had advantage concerning responsiveness. Lastly, from the QFD, the importance ratings show that couriers must prioritize the components of services: rating system for riders and employee and personnel training.

## **Keywords**

Service Quality, Customer Satisfaction, Analytic Hierarchy Process, Quality Function Deployment

## **1. Introduction**

### **1.1 Background**

The past few decades have witnessed rapid development in the economy and the industry. During the contemporary era, the service industry had progressively begun to emerge, and it has currently become on par with the manufacturing and agricultural industries which used to serve as primary drivers of the economy (Liu et al., 2005). For the past twenty years, service industries are becoming a large component of economic output along with other industries, hence, the gradual shift from an industrial to a service economy is natural and inevitable as time goes by (Cheng, 2013; Kon, 1997).

The service industry is very broad in nature; it encompasses a wide scope of activities, ranging from transportation, education, medical services, banking, and telecommunications in which all of these are essential to the functioning of the society and the economy. According to Ranasinghe (2021), no economy can survive without the service sector especially during the present time.

One of the renowned industries which provides services to the community is the delivery courier services – these are businesses which facilitates the transport and delivery of documents and packages. These industries could have various specializations including express and local shipping, regional shipping, and shipping services all over the world (Karcz & Slusarczyk, 2016). Along with the expansion of E-commerce, the demand for delivery courier services has also increased. Primarily, during the pandemic where community restrictions are imposed, these services

are observed to have surge in demands because of the emergence of online purchasing (Libo-on, 2021; Sanchez, 2020). Delivery services have been convenient and necessary for businesses and individuals hence the said industry has been important for countries like the Philippines (Dones & Young, 2020).

In the Philippines, the demand for delivery services has paved the way for the rise of various delivery service companies. Among the most distinguished providers of these services include Fastrack Courier Services, Gogo Xpress, NinjaVan Philippines, and J&T Express. As more similar industries are opening, the competition among these couriers is increasing. In order for these couriers to gain a competitive advantage, their services must make a difference in terms of providing services to their customers. Hence, delivery courier services must be able to sustain the quality of service so as to achieve customer satisfaction (Libo-on, 2021). One of the models used by most of these companies is the SERVQUAL model, which consists of five dimensions such as assurance, reliability, responsiveness, tangibles, and empathy (Qualtrics, 2020). In this study, the researchers intend to assess and compare the services provided by various delivery couriers in the Philippines based on the aforementioned SERVQUAL dimensions.

## **1.2 Gap of Missing Information**

Previous studies utilized the five SERVQUAL dimensions in evaluating the quality of services offered by different businesses. Also, several reviews and related literature have already applied the model in the study of delivery courier services. However, it was observed that these research articles mainly covered the applications of the SERVQUAL model in terms of identifying the impacts of the five dimensions towards customer satisfaction; there were limited studies which have actually tackled the determination of competitive advantages of each delivery couriers based on these dimensions. Moreover, there were only few research papers which explored other tools under operations management and six sigma applications.

## **1.3 Objectives**

To address the gap, the present study aims to compare the customer satisfaction on the services offered by Philippine delivery couriers based on the five SERVQUAL dimensions. Also, the researchers would like to rank these delivery couriers based on the ratings of the customers through the use of Analytic Hierarchy Process. Furthermore, this research aims to determine the specific dimensions which could help the delivery couriers improve the quality of their service by utilizing Prioritization Matrix and Quality Function Deployment (QFD).

## **1.4 Significance of the Study**

The findings from this study will benefit the society considering the vital roles played by these delivery services during this pandemic. The greater the demand for these delivery courier services, the more challenges they face in terms of competition within the industry. Thus, service industries may apply the recommended solutions derived from the results of this paper to achieve a difference in the quality of services provided to customers. For the researchers, the study will help them uncover critical areas in the service industries that many researchers were not able to consider. Thus, a new learning in the field of the service industry and specifically courier services may be acquired.

## **1.5 Scope and Limitations**

Primarily, this study focuses on comparing and evaluating four delivery courier services in the Philippines such as Fastrack Courier Services, Gogo Xpress, NinjaVan Philippines, and J&T Express. Also, data regarding the customer satisfaction would only be based on the perspective of the sender and receiver of the packages. The selection of respondents is also limited to consumers within the National Capital Region (NCR).

## **2. Literature Review**

### **2.1 Service Quality**

Nowadays, customers have diverse expectations from the services provided by different companies and service providers. Consumers are not simply satisfied with seeing the basic quality features from the products or services they avail of but rather, their perception of quality from these services offered by businesses are towards excellence. According to Van der Wiele et al. (2002), the provision of excellent quality of service is crucial for

businesses in order for them to get more customers, as these could influence customer loyalty and retention. Service quality correlates customer expectations with service performance. Hence, it has a significant effect as with regards to boosting the overall performance and competitive advantage of a firm over other providers (Borgave et al., 2016). In order to achieve this, measures for improving the performance and outcome must be defined.

In the case of delivery courier service providers, standard metrics must be set from which we can measure the level of satisfaction of the customers availing of such services so that we can arrive on a fair assessment and identify as to what extent a certain courier service will have higher customer satisfaction. According to Parasuraman et al. (1988), to measure the consumer perceptions of service quality, SERVQUAL has been proposed in which service quality is measured in five dimensions including reliability, tangibles, responsiveness, assurance, and empathy. The SERVQUAL model suggests that consumer perceptions of quality are influenced by five gaps occurring in the internal processes of service delivery (Liu et al., 2005).

## **2.2 Service Quality Dimensions**

The SERVQUAL model is an approach which assesses and evaluates quality of service on the basis of customer perception of quality; it is composed of five main dimensions, such as assurance, reliability, responsiveness, tangibles, and empathy (Liu et al., 2005). The model is generally utilized as a service quality instrument which aims to assess customer satisfaction, observe trends in the quality of services, and determine relative significance of each of the five dimensions (Haming et al., 2019). In the research written by Parasuraman et al., (1998) each of the five SERVQUAL dimensions were further described:

### **2.2.1 Reliability**

Reliability concerns the firm's capabilities to perform their promised service to the customers; it is also the ability of a business to maintain the trust of their customers through the provision of an accurate, dependable, and punctual service (Parasuraman et al., 1998).

### **2.2.2 Responsiveness**

Responsiveness pertains to the ability of the businesses to respond promptly to their customers. The dimension covers a wide scope, ranging from a service provider's capability to quickly answer inquiries, regularly update customers, and constantly communicate with people through various medium (Parasuraman et al., 1998).

### **2.2.3 Assurance**

This dimension of service quality refers to both knowledge and workplace courtesy displayed by employees. Assurance also refers to their ability to give respect and show credibility so that they would be able to gain their customer's trust and confidence (Parasuraman et al., 1998).

### **2.2.4 Empathy**

Empathy relates to a firm's care and individualized attention towards their fellow customers; this dimension is often concerned with the relationship between the clients and the service provider (Parasuraman et al., 1998).

### **2.2.5 Tangibles**

Tangibles pertain to the physical aspects of the service, such as the appearance and neatness of employees and personnel, the condition of the equipment and transport vehicles, and the quality of the service materials used by the company (Parasuraman et al., 1998).

## **2.3 Customer Satisfaction**

In the current market environment, customer experience has become a source of competitive advantage (Handoko, 2016). This is because service quality is an important factor to the customer's satisfaction. Also, as one of the important links in online shopping, logistics service and its quality have positive effects on customer satisfaction. Thus thorough, timely, and reliable logistics service can efficiently increase customer satisfaction (Hua & Jing, 2015). According to Libo-on (2021), customer's satisfaction which can be obtained through surveys and other mediums can help businesses improve their products and services. Customer's feedback is characterized as an evaluation of product or service by a customer to determine whether such a product or service meets the customer's needs and expectations (Liboon, 2021).

### 3. Methods

#### 3.1 Conceptual Framework

The primary objective of the present study was to compare the customer satisfaction on the services offered by Philippine delivery couriers based on the five SERVQUAL dimensions. Also, the researchers ranked these delivery couriers through the use of Analytic Hierarchy Process. The study had also determined the specific dimensions which could help the delivery couriers improve the quality of their service by using Prioritization Matrix and Quality Function Deployment (QFD). The outcome of the analysis and approaches would be the priority strategy for customer satisfaction. Throughout the study, the researchers were guided by the following conceptual framework:

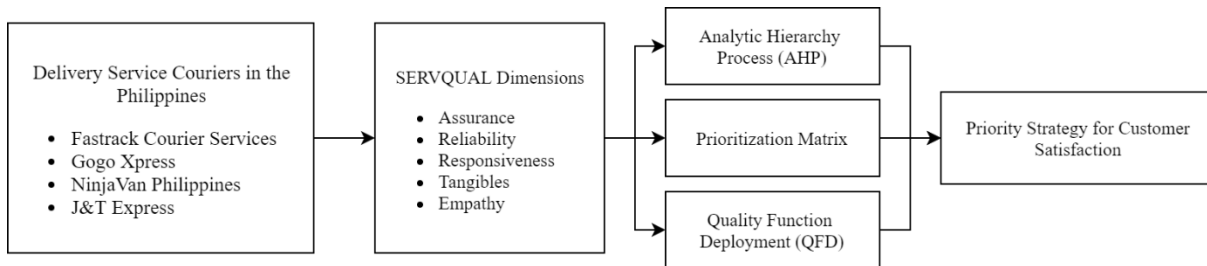


Figure 1. Conceptual Framework

#### 3.2 Participants

A total of 270 individuals in the National Capital Region were the chosen participants of the study. Out of the respondents, 33% were employed for wages, 51.5% were students, 12.5% were self-employed, and 3% were unemployed. The aforementioned individuals were the target respondents of the study because they were the ones who had access of the services provided by the four delivery courier services being compared in the research study.

#### 3.3 Analysis Tools

##### 3.3.1 Analytic Hierarchy Process

The Analytic Hierarchy Process (AHP) is a tool utilized in making decisions concerning the selection of alternatives; this technique involves the evaluation based on multiple criteria with corresponding weights. Developed by Thomas Saaty, the analytic hierarchy process had been widely used by several researchers (Bhushan & Rai, 2004). Principally, the application of the tool begins with outlining the problem into a logical hierarchy. Then, researchers perform pairwise comparisons between the alternatives being studied. The basis for the comparisons could be from concrete data or judgements (Saaty, 2008).

The present study made use of the analytic hierarchy process technique to compare various delivery service couriers; Fastrack Courier Services, Gogo Xpress, NinjaVan Philippines, and J&T Express were considered as the alternatives, while the SERVQUAL dimensions, such as assurance, reliability, responsiveness, tangibles, and empathy were treated as the factors. In this research, the corresponding weights for each dimension were adapted from the study by Liu et al. (2005). Table 1 represents the normalized matrix of pairwise comparisons as well as the computation for the priority weights verified by Saaty (2008):

Table 1. Weights for SERVQUAL Dimensions

|     | REL         | RES         | ASS         | EMP          | TAN         | Row Sum     | Weight       |
|-----|-------------|-------------|-------------|--------------|-------------|-------------|--------------|
| REL | 1.00        | 2.00        | 0.50        | 7.00         | 5.00        | <b>1.39</b> | <b>0.278</b> |
| RES | 0.50        | 1.00        | 0.25        | 3.00         | 2.00        | <b>0.64</b> | <b>0.128</b> |
| ASS | 2.00        | 4.00        | 1.00        | 9.00         | 8.00        | <b>2.43</b> | <b>0.486</b> |
| EMP | 0.14        | 0.33        | 0.11        | 1.00         | 0.50        | <b>0.21</b> | <b>0.042</b> |
| TAN | 0.20        | 0.50        | 0.13        | 2.00         | 1.00        | <b>0.33</b> | <b>0.066</b> |
| Sum | <b>3.84</b> | <b>7.83</b> | <b>1.99</b> | <b>22.00</b> | <b>16.5</b> | <b>5.00</b> | <b>1.000</b> |

Moreover, with the goal of determining the best delivery courier services among the alternatives, the researchers were guided by the logical hierarchy shown in Figure 2.

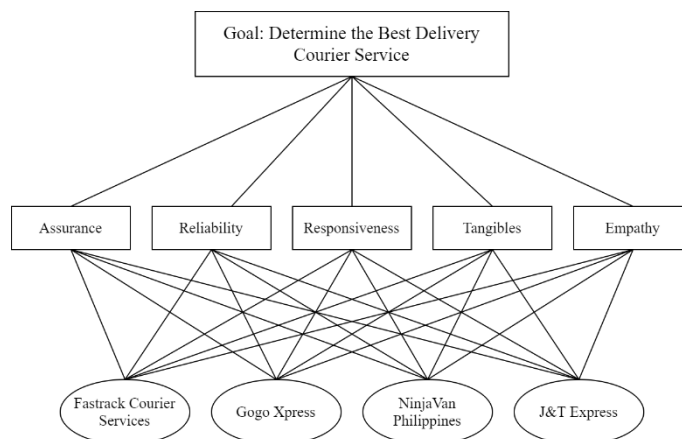


Figure 2. Logical Hierarchy for SERVQUAL Dimensions and Delivery Courier Services

### 3.3.2 Prioritization Matrix

Prioritization Matrix is a service quality tool which compares alternatives based on the raw score and specified criteria. In the study, the tool was used in order to find out which specific dimensions did each service delivery couriers had competitive advantages against the other. Hence, the output would provide a way for these companies to prioritize the dimension which they must examine for improvement.

### 3.3.3 Quality Function Deployment

Quality Function Deployment (QFD) is an approach which provides a method of translating customer requirements into respective technical requirements; the primary functions of the said service quality tool are quality management, development, and customer needs analysis (de Oliveira et al., 2020). In this study, the researchers applied the House of Quality graphic technique in order to come up with various strategies for fulfilling customer wants and achieving customer satisfaction.

## 4. Data Collection

The present study conducted a survey to gather data regarding the customer satisfaction for services provided by various delivery couriers. It was distributed online, and the survey was focused on determining the customer ratings for the performance of each delivery courier companies which were Fastrack Courier Services, Gogo Xpress, NinjaVan Philippines, and J&T Express.

The first part of the survey initially asked for the demographics of the respondents. For the second part, the researchers asked the participants to rate their satisfaction for the services offered by the couriers on the basis of assurance, reliability, responsiveness, tangibles, and empathy. The survey made use of a 1-5 rating scale, with 5 being the highest, and 1 being the lowest. For each dimension, specific metrics were described in detail so that the respondents could easily indicate their rating based on their experiences.

The collected data were then treated using the analytic hierarchy process (AHP), Prioritization Matrix, and House of Quality technique.

## 5. Results and Discussion

### 5.1 Statistical Treatment

Prior to the application of analytic hierarchy process as well as the analysis using the service quality tools, Grubbs' test for outliers was performed. This is to ensure that no outliers affected the accuracy of the results. In case there were outliers observed in the data, the responses were removed. Table 2 summarizes the results of the outlier test, wherein N represents the number of samples, G denotes the Grubbs' test value, and P indicates the p-value.

Table 2. Results of Grubbs' Test for Outliers

| Dimensions     | Fastrack |      |      | Gogo Xpress |      |      | NinjaVan |      |      | J&T Express |      |      |
|----------------|----------|------|------|-------------|------|------|----------|------|------|-------------|------|------|
|                | N        | G    | P    | N           | G    | P    | N        | G    | P    | N           | G    | P    |
| Assurance      | 57       | 2.14 | 1.00 | 52          | 3.00 | 0.09 | 60       | 2.77 | 0.26 | 95          | 2.63 | 0.71 |
| Reliability    | 57       | 2.95 | 0.12 | 52          | 2.95 | 0.11 | 60       | 2.62 | 0.43 | 95          | 2.46 | 1.00 |
| Responsiveness | 57       | 3.05 | 0.09 | 52          | 2.31 | 0.95 | 60       | 2.50 | 0.63 | 95          | 2.57 | 0.87 |
| Tangibles      | 57       | 1.62 | 1.00 | 52          | 2.81 | 0.18 | 60       | 2.50 | 0.63 | 95          | 2.50 | 1.00 |
| Empathy        | 57       | 2.51 | 0.58 | 52          | 2.75 | 0.23 | 60       | 2.62 | 0.43 | 95          | 2.40 | 1.00 |

Based on the calculated values of P for the SERVQUAL Dimensions from each delivery courier, all p-value results are not significant since these are all greater than the significance level of 0.05. Hence, there are no outliers observed in the obtained data.

## 5.2 Analytic Hierarchy Process

In the application of analytic hierarchy process in assessing the quality of service on the basis on customer satisfaction, the following were the summary of results:

Table 3. Summary of Analytical Hierarchy Process

|                       | Fastrack     | Gogo Xpress  | NinjaVan     | J&T Express  |
|-----------------------|--------------|--------------|--------------|--------------|
| <b>Assurance</b>      | 0.193        | 0.193        | 0.041        | 0.058        |
| <b>Reliability</b>    | 0.110        | 0.110        | 0.013        | 0.045        |
| <b>Responsiveness</b> | 0.006        | 0.038        | 0.023        | 0.061        |
| <b>Tangibles</b>      | 0.009        | 0.043        | 0.003        | 0.010        |
| <b>Empathy</b>        | 0.002        | 0.029        | 0.004        | 0.007        |
|                       | <b>0.320</b> | <b>0.413</b> | <b>0.085</b> | <b>0.183</b> |

Primarily, the assurance dimension was led by Fastrack and Gogo Xpress – each with a result of 0.193. Meanwhile, J&T Express had a result of 0.058, and NinjaVan had a rating of 0.041. Based on these values, both Fastrack and Gogo Xpress had higher customer ratings concerning the knowledge and workplace courtesy displayed by their employees; both couriers show credibility hence they were able to gain their customer's trust and confidence. Concerning reliability, Fastrack and Gogo Xpress both had a result of 0.110 and were higher compared to NinjaVan with 0.013 and J&T Express with 0.045. This implies that both couriers were able to satisfactorily deliver their promised service to their customers.

For responsiveness, Fastrack gained a score of 0.006, Gogo Xpress obtained a rating of 0.038, while NinjaVan has 0.023. For this dimension, J&T Express earned the highest weighted customer rating of 0.061 – which implies that the courier is the most prompt in responding to customers.

Moreover, for Tangibles, Gogo Xpress gave the highest total of 0.043, while Fastrack, NinjaVan, and J&T obtained ratings of 0.009, 0.003, and 0.010, correspondingly. This means that for majority of the customers, Gogo Xpress had the most satisfactory personnel appearance, packaging, and equipment. Lastly, for empathy, Gogo Xpress was the best delivery courier with a score of 0.029, followed by J&T Express with a score of 0.007, NinjaVan with a score of 0.004, and Fastrack with a score of 0.002. This implies that Gogo Xpress addresses feedbacks outstandingly compared to the other three couriers.

With reference to the graph shown in Figure 3, the weighted customer ratings of Gogo Xpress for each five SERVQUAL dimensions were consistently high. At the same time, Fastrack Courier Services had high ratings with regards to assurance and reliability, while J&T Express only had a high score for responsiveness. On the other hand, NinjaVan relatively had lower ratings compared to other couriers.

Overall, Gogo Xpress was determined to be the best delivery courier with a score of 0.413. It was followed by Fastrack Courier Services with a score of 0.320. Next in ranking was J&T Express with a score of 0.183, while the last courier was NinjaVan with a score of 0.085.

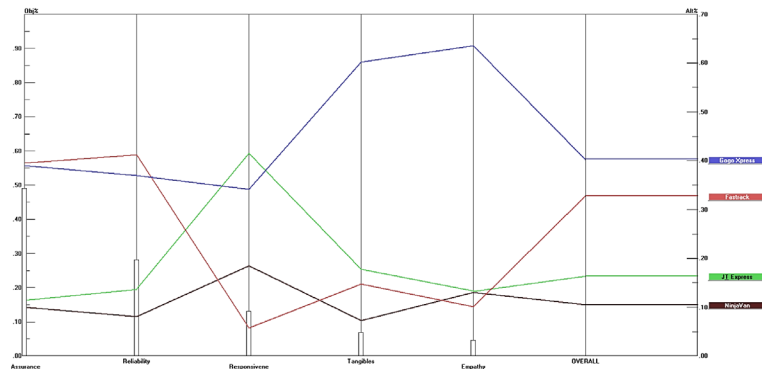


Figure 3. Graph of Analytical Hierarchy Process for Delivery Couriers

### 5.3 Prioritization Matrix

Table 4. Prioritization Matrix Comparing Fastrack Courier Services and Gogo Xpress

| Factor         | Weight | Fastrack Wtd | Gogo Wtd | Difference | Advantage   |
|----------------|--------|--------------|----------|------------|-------------|
| Assurance      | 0.486  | 2.132        | 2.131    | 0.0005     | Fastrack    |
| Reliability    | 0.278  | 1.166        | 1.165    | 0.0003     | Fastrack    |
| Responsiveness | 0.128  | 0.514        | 0.537    | -0.0223    | Gogo Xpress |
| Tangibles      | 0.066  | 0.279        | 0.288    | -0.0090    | Gogo Xpress |
| Empathy        | 0.042  | 0.174        | 0.184    | -0.0103    | Gogo Xpress |

Table 4 shows the comparison between Fastrack Courier Services and Gogo Xpress. Based on the results, Fastrack had a competitive advantage for assurance and reliability against Gogo Xpress, in which the differences were 0.012 and 0.011, respectively. For the responsiveness, tangibles and empathy, Gogo Xpress had the advantage which were shown in the differences of -0.0223, -0.0090, and -0.0103, correspondingly. Since the values were negative, the weighted score of Gogo Xpress were higher for the said dimensions.

Table 5. Prioritization Matrix Comparing Fastrack Courier Services and NinjaVan Philippines

| Factor         | Weight | Fastrack Wtd | NinjaVan Wtd | Difference | Advantage |
|----------------|--------|--------------|--------------|------------|-----------|
| Assurance      | 0.486  | 2.132        | 2.082        | 0.0501     | Fastrack  |
| Reliability    | 0.278  | 1.166        | 1.117        | 0.0490     | Fastrack  |
| Responsiveness | 0.128  | 0.514        | 0.533        | -0.0191    | NinjaVan  |
| Tangibles      | 0.066  | 0.279        | 0.273        | 0.0063     | Fastrack  |
| Empathy        | 0.042  | 0.174        | 0.176        | -0.0025    | NinjaVan  |

Table 5 summarizes the results of the comparison between Fastrack Courier Services and NinjaVan Philippines. Based on the results, Fastrack had a competitive advantage for assurance, reliability, and tangibles where the differences were 0.0501, 0.0490, and 0.0063, respectively. For the responsiveness and tangibles, NinjaVan had the advantages.

Table 6. Prioritization Matrix Comparing Fastrack Courier Services and J&T Express

| Factor         | Weight | Fastrack Wtd | J&T Wtd | Difference | Advantage   |
|----------------|--------|--------------|---------|------------|-------------|
| Assurance      | 0.486  | 2.132        | 2.092   | 0.0392     | Fastrack    |
| Reliability    | 0.278  | 1.166        | 1.147   | 0.0185     | Fastrack    |
| Responsiveness | 0.128  | 0.514        | 0.540   | -0.0260    | J&T Express |
| Tangibles      | 0.066  | 0.279        | 0.280   | -0.0009    | J&T Express |
| Empathy        | 0.042  | 0.174        | 0.177   | -0.0034    | J&T Express |

Table 6 shows the comparison between Fastrack Courier Services and J&T Express. The results indicate that Fastrack had a competitive advantage for assurance and reliability, while J&T Express had the competitive advantages concerning responsiveness, tangibles, and empathy.

Table 7. Prioritization Matrix Comparing Gogo Xpress and NinjaVan Philippines

| Factor                | Weight | Gogo Wtd | NinjaVan Wtd | Difference | Advantage   |
|-----------------------|--------|----------|--------------|------------|-------------|
| <b>Assurance</b>      | 0.486  | 2.131    | 2.082        | 0.0496     | Gogo Xpress |
| <b>Reliability</b>    | 0.278  | 1.165    | 1.117        | 0.0487     | Gogo Xpress |
| <b>Responsiveness</b> | 0.128  | 0.537    | 0.533        | 0.0032     | Gogo Xpress |
| <b>Tangibles</b>      | 0.066  | 0.288    | 0.273        | 0.0153     | Gogo Xpress |
| <b>Empathy</b>        | 0.042  | 0.184    | 0.176        | 0.0078     | Gogo Xpress |

Table 7 shows the comparison between Gogo Xpress and NinjaVan Philippines. It can be seen that Gogo Xpress delivery courier had the competitive advantage in all factors. All positive differences of 0.0496, 0.0487, 0.0032, 0.0153, and 0.0078 indicates that Gogo Xpress had higher weighted scores in all dimensions.

Table 8. Prioritization Matrix Comparing GogoXpress and J&T Express

| Factor                | Weight | Gogo Wtd | J&T Wtd | Difference | Advantage   |
|-----------------------|--------|----------|---------|------------|-------------|
| <b>Assurance</b>      | 0.486  | 2.131    | 2.092   | 0.0387     | Gogo Xpress |
| <b>Reliability</b>    | 0.278  | 1.165    | 1.147   | 0.0183     | Gogo Xpress |
| <b>Responsiveness</b> | 0.128  | 0.537    | 0.540   | -0.0037    | J&T Express |
| <b>Tangibles</b>      | 0.066  | 0.288    | 0.280   | 0.0081     | Gogo Xpress |
| <b>Empathy</b>        | 0.042  | 0.184    | 0.177   | 0.0069     | Gogo Xpress |

Table 8 displays the comparison between Gogo Xpress and J&T Express. It is observed in the matrix that Gogo Xpress delivery courier had the competitive advantage in most factors, namely assurance, reliability, tangibles, and empathy. Meanwhile, J&T Express only had the advantage with regards to responsiveness because the difference of -0.0037 had a negative value.

Table 9. Prioritization Matrix Comparing NinjaVan Philippines and J&T Express

| Factor                | Weight | NinjaVan Wtd | J&T Wtd | Difference | Advantage   |
|-----------------------|--------|--------------|---------|------------|-------------|
| <b>Assurance</b>      | 0.486  | 2.082        | 2.092   | -0.0108    | J&T Express |
| <b>Reliability</b>    | 0.278  | 1.117        | 1.147   | -0.0305    | J&T Express |
| <b>Responsiveness</b> | 0.128  | 0.533        | 0.540   | -0.0069    | J&T Express |
| <b>Tangibles</b>      | 0.066  | 0.273        | 0.280   | -0.0072    | J&T Express |
| <b>Empathy</b>        | 0.042  | 0.176        | 0.177   | -0.0009    | J&T Express |

Table 9 shows the comparison between NinjaVan Philippines and J&T Express. In this prioritization matrix, J&T Express had the competitive advantage in all factors because all differences were negative. These values imply that in all dimensions, the weighted score of J&T Express were higher than the scores of NinjaVan Philippines.

### 5.3 Quality Function Deployment: House of Quality

Based on the House of Quality (HOQ), the customer wants that were identified were: assurance, reliability, responsiveness, tangibles, and empathy.

To achieve quality in the services provided by the four delivery couriers, the researchers establish service components that could help meet the customer needs and wants; these were placed in the HOQ as: rating system for riders, employee and personnel training, upgraded tracking system, enhanced packaging design, provision of proof of deliveries, optimized delivery route systems, and prompt feedback and response system.



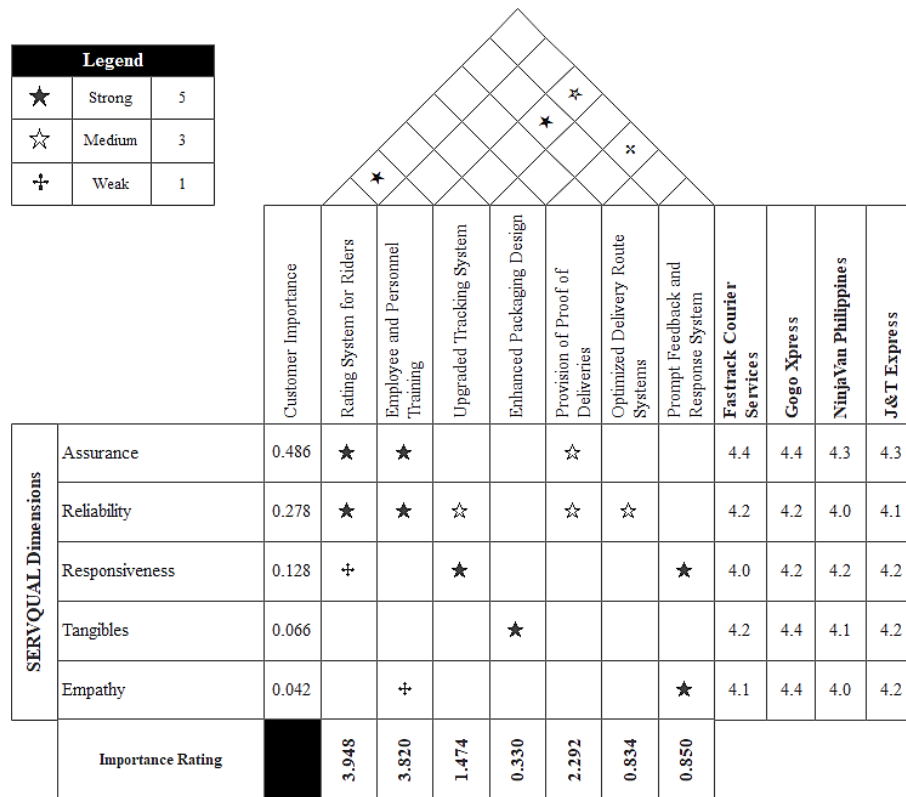


Figure 4. House of Quality Approach for Delivery Courier Services

The customer wants and needs were assigned weights based on the degree of importance as perceived by the customers. Customer wants were related to service ‘how’s’ through the relationship matrix. With reference to the customer important ratings and each of the corresponding weights of the dimensions, the importance ratings were computed. The importance ratings show that the components of services that must be prioritized by the couriers were the rating system for riders as well as the employee and personnel training. These had ratings of 3.948 and 3.820, respectively. Both components are vital to the courier services especially if they want to be competitive within the industry.

## 6. Conclusion

The primary goal of this study was to compare customer satisfaction among the Philippine delivery courier services based on the five SERVQUAL measurements. Also, the researchers ranked these delivery couriers through the use of Analytic Hierarchy Process. The study had also determined the specific dimensions which could help the delivery couriers improve the quality of their service by using Prioritization Matrix and Quality Function Deployment (QFD). In essence, the aforementioned objectives were successfully fulfilled by the researchers.

In summary, the results obtained in AHP show that Gogo Xpress has led the rankings among the different couriers in the Philippines. It was followed by Fastrack, J&T Express and NinjaVan Philippines, correspondingly. This indicates that Gogo Xpress had been the most preferred courier service on the basis of customer satisfaction. Moreover, the results acquired from the prioritization matrix had specified the dimensions where each delivery courier services had competitive advantages. With reference to the matrices, Gogo Xpress had competitive advantages for all dimensions, Fastrack had competitive advantage with regards to assurance and reliability, while J&T Express had advantage concerning responsiveness. For the QFD, the importance ratings show that the components of services that must be prioritized by the couriers were the rating system for riders as well as the employee and personnel training; these would help the courier services to be competitive within the industry. Indeed, it is important for the businesses in the service industries to satisfy the customers because the voice of the customer is very significant since this will play a significant role in the profitability and much more long-term survival of the business.

## 7. References

- Borgave, S., & Koranne, S. (2012). Service Quality Management: A Literature Review. *Ethos*, 5(2).
- Bhushan, N., & Rai, K. (2007). Strategic decision making: applying the analytic hierarchy process. Springer Science & Business Media.
- Cheng, D. (2013). The development of the service industry in the modern economy: mechanisms and implications for China. *China Finance and Economic Review*, 1(1), 1-12.
- de Oliveira, L. M. V., Santos, H. F. D., de Almeida, M. R., & Costa, J. A. F. (2020). Quality Function Deployment and Analytic Hierarchy Process: A literature review of their joint application. *Concurrent Engineering*, 28(3), 239-251.
- Dones, R. L. E., & Young, M. N. (2020, September). Demand on the of Courier Services during COVID-19 Pandemic in the Philippines. In *2020 7th International Conference on Frontiers of Industrial Engineering (ICFIE)* (pp. 131-134). IEEE.
- Haming, M., Murdifin, I., Syaiful, A. Z., & Putra, A. H. P. K. (2019). The application of SERVQUAL distribution in measuring customer satisfaction of retails company. *The Journal of Distribution Science*, 17(2), 25-34.
- Handoko, L. P. (2016). The Effect of Product Quality and Delivery Service on Online-customer Satisfaction in Zalora Indonesia. *Jurnal EMBA: Jurnal Riset Ekonomi, Manajemen, Bisnis dan Akuntansi*, 4(1).
- Hua, W., & Jing, Z. (2015). An empirical study on e-commerce logistics service quality and customer satisfaction. *WHICEB Proceeding*, 269-275.
- Kon, A. (1997). Service industries and service economy. Retrieved from [https://www.researchgate.net/publication/23646193\\_Service\\_Industries\\_and\\_Service\\_Economy](https://www.researchgate.net/publication/23646193_Service_Industries_and_Service_Economy).
- Libo-on, J. T. Service Quality Influence on Customer Satisfaction in Courier Services: A Comparative Study.
- Liu, D., Bishu, R. R., & Najjar, L. (2005). Using the analytical hierarchy process as a tool for assessing service quality. *Industrial Engineering and Management Systems*, 4(2), 129-135.
- Qualtrics. (2020). How to Measure Service Quality. Retrieved from <https://bit.ly/38kUd1Q>
- Parasuraman, A., Zeithaml, V. A., & Berry, L. (1988). SERVQUAL: A multiple-item scale for measuring consumer perceptions of service quality. *1988*, 64(1), 12-40.
- Ranasinghe, R. (2021). After Corona (COVID-19) Impacts on Global Poverty and Recovery of Tourism Based Service Economies: An Appraisal. *International Journal of Tourism and Hospitality*, 1(1), 52-64.
- Karcz, J., & Ślusarczyk, B. (2016). IMPROVEMENTS IN THE QUALITY OF COURIER DELIVERY. *International Journal for Quality Research*, 10(2).
- Saaty, T. L. (2008). Relative measurement and its generalization in decision making why pairwise comparisons are central in mathematics for the measurement of intangible factors the analytic hierarchy/network process. *RACSAM-Revista de la Real Academia de Ciencias Exactas, Físicas y Naturales. Serie A. Matemáticas*, 102(2), 251-318.
- Sanchez, Martha Jean (2020) Reasons for rising orders from food delivery apps during COVID-19 Philippines 2020. Retrieved from <https://bit.ly/3v7Msq7>
- Van Der Wiele, T., Boselie, P., & Hesselink, M. (2002). Empirical evidence for the relationship between customer satisfaction and business performance. *Managing Service Quality: An International Journal*.

## Acknowledgements

The researchers of the study would like to thank their Operations Research Professor, Engr. Rianina D. Borres, for sharing her knowledge, assistance, and expertise throughout the writing process. With her help, the group was able to properly apply the tools needed to finish the research. Also, the group expresses their gratitude towards their family and loved ones for the encouragement they had given to them, especially during the given situation wherein moral support is indeed important.

## Biographies

**Kianna Denise C. Villapando** is a second-year college student at Mapua University, School of Industrial Engineering and Engineering Management, Intramuros, Manila. She is taking up Bachelor of Science in Industrial Engineering. She is currently a member of Philippine Institute of Industrial Engineers – Mapua Student Chapter and Honor Society of Mapua. She has published conference papers in the field of Industrial Engineering, particularly in the area of statistics. Her research interests include ergonomics, statistics, and quality management.

**Alliah Jane S. Agunos** is enrolled as a second-year college student at Mapua University, School of Industrial Engineering and Engineering Management, Intramuros, Manila. She is taking up Bachelor of Science in Industrial Engineering. Her research interests include accounting and work study and measurement. She is the logistics manager of Production and Operations Management Association of the Philippines – Mapua Chapter.

**Anthony A. Sanchez** is currently enrolled as a second-year college student at Mapua University, School of Industrial Engineering and Engineering Management, Intramuros, Manila. He is taking up Bachelor of Science in Industrial Engineering. His research interests include ergonomics, accounting, and engineering management. He is a member of Philippine Institute of Industrial Engineers – Mapua Student Chapter.

**Leanne Dominique B. Loto** is enrolled as a second-year college student at Mapua University, School of Industrial Engineering and Engineering Management, Intramuros, Manila. She is currently taking Bachelor of Science in Industrial Engineering. Operations research, and work study and measurement are her research interests. She is the assistant secretary of Production and Operations Management Association of the Philippines – Mapua Chapter.

**Rianina D. Borres** is an Assistant Professor of School of Industrial Engineering and Engineering Management at Mapua University in Intramuros, Manila, Philippines. She has earned her B.S degree in Industrial Engineering (IE) and Master of Engineering Program major in IE from Mapua University, Intramuros, Manila, Philippines. She is a Professional Industrial Engineer (PIE) with over 15 years of experience. She has taught courses in Probability and Statistics, Methods and Time Study, Systems Engineering, Operations Research and Computer Integrated Manufacturing. She is a part-time consultant that specializes in improving different systems/processes which includes re-layout, computation of manpower requirement, establish Job Description, etc. She has done research projects in operations research, production and human factors and ergonomics. She is a member of Philippine Institute of Industrial Engineers (PIIE).