

A Comparison of Food Delivery Applications (GrabFood, FoodPanda, and Pick.A.Roo) in the Philippines through Utilization of Analytical Hierarchy Process

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Abstract

This research study aims to assess the different factors of using the 3 different applications (Grabfood, FoodPanda and Pick.A.Roo) to help the consumers to be aware of using it. By comparing the data from each criteria, the delivery companies could also improve their services for better experience. Analytical Hierarchical Process (AHP) was utilized in order to determine the weights and decision of each factor to the study. The data was gathered through google forms survey questionnaires. Based on the computed weighted alternatives, FoodPanda is considered as the top alternative, Pick.A.Roo as the next one and Grabfood at the last. In terms of high weighted factors, mostly the FoodPanda has the highest value per criteria compared to the other applications. The data showed that people are usually looking at the delivery time, security and safety, and availability of food and restaurant choices of the food delivery applications.

Keywords:

Online Food delivery (OFD), Analytical Hierarchy Process (AHP), GrabFood, FoodPanda, and Pick.A.Roo

1. Introduction

Nowadays, technology has been widely booming and even the oldest generations have been adapting to the new norm. For some people, it is something that is not quite interesting and somewhat distracting. And the latter would technically be entertained and pleased by what the contemporary world has to offer. Technology can sometimes be either irrational or immoderate, with its peculiar and odd innovations, it can be unreliable and skeptical. Most of the time, technology users have been quite addicted or restrained from the unfathomable reasons of usage of technology such as mobile phones, tablets, computers and the like. What makes it appalling is the fact that it is not noticeable which makes technology somewhat questionable. It clings to an individual that it worsens one's point of view of reality. Isolation among different humans, less interactions, inability to see what's beyond the screen. On the other hand, it does not particularly focus on the disadvantages of technology but has beneficial aspects too.

Technology was able to develop for years and it has finally come to a point where the unthinkable has already existed. Robots, electric vehicles, 3D printing, e-cigarettes, gene editing, digital assistants, and more. During its early years, technology was being utilized by humans for communication, data recordings and retrieval of past data, cloud computing, internet and search, analytics, immersive and augmented-reality, and automation. But now, technology has become more riveting that humans are able to stay at home and not take the extra mile to commute all the way to their desired restaurant with the use of food delivery applications such as Grabfood, Foodpanda, and Pick.A.Roo. These are three known online food delivery (OFD) applications that are based in the Philippines and other applications are globally known as well. They offer various foods that are located around your area either local restaurants or international. The most common reason for consumers having much of their attention to OFD is because of its convenience. Another would be that it seems to be a need for fast and easy meals during or after a long day at work. The numerous food delivery systems that are readily accessible relieve customers of the burden of thinking about and planning meals, whether the customer is cooking the meal himself, eating in at a restaurant, or heading to a restaurant and purchasing food to carry back to the workplace or home. (Lau, et al., 2019). Since the Philippines still has its ongoing quarantine lockdown, Filipinos are forced to stay at home and not have the opportunity to leave their homes

and have their meals outdoors. Based on the market, Filipinos choose the best application that can satisfy their needs and wants. When things go bad for them, they tend to switch to a different application that's more satisfactory and has less errors. According to Cana (2020), since the overwhelming majority of Filipinos in Metro Manila and the rest of Luzon were following instructions to remain indoors, demand for Grab's delivery service increased at an unprecedented rate, especially during the quarantine period.

According to Domingo (2021), the current state of the digital economy is characterized as "resilient and racing ahead" in a study jointly published by Google, Temasek, and Bain & Co. titled "e-Economy SEA (Southeast Asia) 2020." This research was focused on an online survey that took place between August 18 and September 9. They found that food distribution and e-commerce were a hit in the Philippines, with growth rates of 48% and 58%, respectively. Filipinos have also rendered the "flight to digital" and are "online with a purpose," as has been observed elsewhere in the country. This study seeks to know what are the main factors that affect consumer's choices and satisfaction between applications and other factors such as the safety and security of the app, speed of delivery, availability of food and restaurant choices, flexibility of payment methods, customer services and more. These criteria will be discussed under the methods section. With the known factors, what are ways to improve such gaps. Improving one's business creates more and more consumers and increases profit. Competition among food deliveries is a huge characteristic and this study allows owners of OFD applications to enhance and make revisions to their said OFD applications. Each comparison is to be obtained by the use of analytical hierarchy process (AHP). The AHP approach divides the issue into three parts. The dilemma or issue that needs to be addressed is the first portion, and the alternate options that are possible to fix the problem is the second part. The parameters or criteria used to determine the alternative is the third and most critical component of the AHP process.

1.1 Objective

Since the pandemic began in the country last 2020, Filipinos have resorted to websites, applications and companies that offer online and delivery services—be it for groceries, foods, parcels, and etc.. It is more convenient, safe and alleviates the risk of people to get infected by the virus. People are making the most out of the advancement of modern technologies during the quarantine—just clicking a way in their cellular phones or tablets their orders and it'll be right out of their doorsteps after a while. Thus, the emergence of such companies offering these services. These delivery companies have helped tons of people, rather giving a lot of riders the opportunity to have an income during the peak of quarantine. FoodPanda's managing director, Daniel Marogy even mentioned in an interview that since the lockdown, their company's rider count increased by four times and does not expect the demand to massively fall even after the ease of lockdowns (Ibañez, 2021). Although risking their lives to contact the Covid-19 virus, these riders took this rising demand of delivery service to be able to provide for their family.

As aforementioned, many delivery applications have emerged during the last year such as Pick.A.Roo and Toktok PH, alongside the known companies of Grab and FoodPanda—offering a wide range of deliverables (e.g. food, groceries, and parcels). As the online selling and delivery market widens, it is important for consumers to be vigilant and careful of what they're using considering the different factors such as security and safety, customer service, and etc. This study aims to help the consumers to have an awareness of the various factors they must take into account before using an application, specifically food delivery applications. Aside from that, this study will inform the consumers of the companies, particularly the leading application they must rely on such services. Lastly, the knowledge of the readers and consumers with the aid of this study would help delivery companies improve their services for a better experience and satisfaction of their customers.

2. Literature Review

The food delivery system consists of a technology that places order kiosks in smartphones. It has several useable features including maps showing nearby hotels, comprehensive menus, and previous looks at orders. It has a call facility to place calls. The system has two components, one for administrators and one for customers. Customers want profile, order, menu, and provided courier while resto, order, menu, and customers are needed for the admin section. When the consumer books and confirms the flight, all relevant data will be recorded in the database. A notification confirming the order is placed will be shown to the client. (Rahman, 2019)

2.1 Availability of Food and Restaurant Choices

Credibility is the information's degree of trustworthiness, as well as how reliable and up-to-date the platform is. This can be identified as availability of food and restaurant choices. The credibility of an online food distribution system is determined by the consistency of the food choices offered, the restaurants available, and their costs. However, the results in the hypothesis testing revealed that the alternative hypothesis was rejected and the null hypothesis was accepted with a p-value of 0.127. The relationship between customer satisfaction versus the credibility and quality of food is not significantly different. It also suggests that customers are willing to try new things and are unconcerned with the accuracy of the information while utilizing an OFD app. (Panse, et al., 2019)

2.2 Security and Safety

Chai, et. al. (2019) mentioned the major criterions of this study one of which is privacy and security. Privacy, according to Belanger et al. (2002), is the right to view, archive, use, and destroy one's own personal knowledge. Title, phone number, mailing address, bank statement, email address, password, and other personal details are examples of personal information. Consumers are becoming more concerned with how and where their sensitive information is used during internet transactions as a result of many high-profile news stories about data breaches by well-known businesses (Flavian and Guinaliu, 2006). According to Kalakota and Winston (1997), security is a challenge that has resulted in possible incidents involving payment security and data storage through online transactions. Many shoppers stop making online purchases for a variety of reasons, including safety concerns, non-delivery, credit card theft, and post-purchase support, among others. Customers' intentions to buy goods digitally are influenced by their level of confidence, according to Zulkarnain et al. (2015). Many websites have adopted policies that enable users to check, inspect, and certify privacy policies for online purchases to relieve people's minds regarding privacy and security concerns (Ranganathan and Ganapathy, 2002). Based on what Sultan & Uddin (2011) stated, there is a strong relationship regarding privacy and security and the decision to engage in online shopping. Researchers of this study mainly discovered that almost all of the respondents agreed upon that trustworthiness is somewhat critical when online shopping.

2.3 Flexibility of Payment Methods

In the study that Song, Y. et. al. conducted in 2017, the flexibility of payments is one of the factors that increased the satisfaction of customers who are using delivery apps which can lead to the customers to reuse the app which are beneficial to the company. It is also evident that introducing various payment methods can increase the customer approachability. In their study the payment flexibility and convenience shows a positive evaluation of the usage factors which influences the consumer to reuse the delivery apps. Furthermore, the study of Tribhuvan, 2020 shows that one of the most considered factors of the consumer are the flexibility of payment methods and based on his gathered data people are happy due to the wide variety of payments including cash on delivery and bank payments.

2.4 Availability of Promos and Offers

Another factor considered in the study of Natarajan et al. (2019) is the free coupons and discounts given to the consumers—those who recurrently order from the applications and the first timers. This strategy has helped in maintaining and attracting customers, making the application more alluring to the majority. There are occasional vouchers that are given to customers for them to appreciate festive seasons. Moreover, it was found out in the study that their respondents preferred using Zomato because the tax charged was less in contrast to other online food delivery services—making the service accessible to people regardless of their budget. Thus, many customers consider free vouchers and discounts vital as well in considering a food delivery courier to use.

2.5 Accuracy of Orders

The research study that Ribeiro, C. conducted in 2018 showed that order accuracy was one of the most important attributes for the consumers of a delivery app. The study also mentioned that consumers are concerned with both service quality and the result of a particular service while shopping online. Consumers, after all, want assurance that their order will be correct and fulfilled within the specified time frame. Furthermore, the study derived a following hypothesis that will describe the order accuracy as the attribute that consumers value the most regarding food delivery apps. According to (Tribhuvan, 2020), as the world is continuously evolving, people are becoming more confident in using food delivery applications rather than traditional ordering. The consumer's perspective is becoming more open in accepting the technology of ordering. One of the main reasons to use it is because of its convenience and userfriendly interfaces.

2.6 Tracking, Scheduling, and Reordering of Orders

According to Panse et al. (2019), one of the major factors that led to the consumer's desire for online content is control which can be described as tracking, scheduling and reordering of orders. Consumers feel in full charge of the online food delivery applications and they can determine what, where, when, and how much they can purchase. After performing hypothesis testing, it was found that the null hypothesis was rejected and the alternative hypothesis was accepted which states that consumer satisfaction has a statistically important and optimistic association with perceived control. It also ensures that by utilizing an online food ordering service, the customer feels in full power and in command.

2.7 Delivery Fee The study entitled “*Influence of delivery charges and time on online purchase decision*” defines delivery charge as the cost of services that is used to transport the goods from seller to the buyer’s place. Also Petrescu, 2011 said that free shipping allows the consumer to browse easy online, and increase sales. Based on the study that Nguyen, D. et. al., conducted in 2019, it says that charging a low or no delivery fee at all can be an effective marketing tool for the businesses in terms of influencing the consumer’s purchase decision. In general the satisfaction with the physical distribution service price including the delivery fees positively affects the consumer purchase satisfaction and consumer retention (Rao et al., 2011). Furthermore, the delivery fees affect the consumer purchase patterns, affect consumer’s online evaluations and choice, and affect consumer preferences for online offers.

2.8 Speed of Delivery

Majority of the customers had concerns with the quality of food, as well as the delivery—customers wanted a quick delivery, however, there are several delays in the timings—riders must be hired and assigned particular routes in the city wherein they’re familiar (Natarajan et al. 2019). Moreover, according to (Saad, 2019), customers always look for the food delivery’s delivery time, price and condition of food, and service quality. These factors are considered the “direct” reasons that people are always looking out. Direct factors are the main core of the food delivery application. Based on his survey, speed of delivery along with service quality are one of the considerable factors that consumers always look out for. With social separating from the new standard, customers are requesting to have takeout food conveyed right at their doorsteps. A study conducted by Nayan and Hassan (2020) entitled *Customer Satisfaction Evaluation for Online Food Service Delivery System* in Malaysia, was directed to look at the fulfillment of clients by utilizing online food delivery services in Malaysia through a quantitative technique—it will deal with customer conduct, necessities, and client prerequisite components in examining their discernments and satisfaction that will set out the framework to comprehend purchaser’s reliability. All in all, this research has found that most of the respondents are satisfied with the service of FoodPanda and GrabFood because the system is uncomplicated and delivery time is reasonable (Nayan and Hassan, 2020).

2.9 Customer Service

Customer satisfaction cannot be the food delivery companies’ objective, rather focus also on gaining the loyalty and trust of their customers by understanding the significance of providing a quality service, perceived value, etc. This had aided in analyzing the relationship among service quality and perceived value and how these affect the satisfaction of customers, corporate reputation, and behavioral purposes. In addition, studying consumer signified that providing exceptional services and quality to the consumers and generating higher customer value can cause in obtaining satisfaction of customers—affecting as well the retention of customers beside the reputation of the company (Hu et al. 2009).

3. Methods

The Analytic Hierarchy Process (AHP) is a math and psychology-based approach for arranging and evaluating complicated decisions. It was created in the 1970s by Thomas L. Saaty and has since been refined. It consists of three parts: the end objective or dilemma you're attempting to tackle, all potential options (referred to as alternatives), and the parameters or criteria you'll use to evaluate the alternatives. By quantifying the parameters and possible alternatives, and comparing those elements to the ultimate objective, AHP offers a logical basis for a required decision. Numerical values that can be compared against any of the parameters. The AHP is distinguished from other decision-making methods by its capacity to calculate (Passage Technology, 2021). Although there are many requirements, the AHP approach recognizes that the magnitude of each requirement will not be identical. In application to this study, when consumers pick between different OFD applications, a specific criteria is considered, say for example, the waiting time for the rider to deliver the food to its desired destination, the application’s design and system quality, but these factors may not be equally important to all. Another situation is that the accuracy of orders can be much more

critical than the speed of delivery. As a result, giving 2 points to the accuracy of orders and speed of delivery 1 point, it'll be more likely to find and choose an OFD application that meets a consumer's needs and wants.

The researchers based the research project as a quantitative method and used survey questionnaires via Google Forms for data collection. Target respondents would fall around 200 participants, men and women of different ages based on different locations, Luzon, Visayas and Mindanao. The researchers made sure that the respondents have availed and used these online delivery platforms. For some, as limitations, it does not have Foodpanda, Grabfood, and Pick.A.Roo around the area. Participants are only able to choose OFD applications based on their experience. The questions made are numerical based, starting from 4 as the highest rating and 1 as the least rating. To make each scenario understandable and for participants to imagine such scenarios, the researchers also provided more situational information beside each numerical value. Parameters or criteria that are to be measured by the researchers are: availability of food and restaurant choices, which is a revised title of credibility. This falls under the criterion category of Panse, et al. (2019). As well as the criterion of tracking, scheduling, and reordering of orders, so-called as control, security and safety (SS) under Chai, et. al. (2019), customer satisfaction (CS) under Ye-Eun Song et.al., (2017), free coupons and discounts (FCD), quick delivery (QD), and service quality (SQ) under Natarajan et al. (2019), influence of delivery charges and time on online purchase decisions (IODC and TOOPC) from Nguyen, D. et al. (2019), flexibility of payment methods (FOPM) from Natarajan et al. (2019), and order accuracy from Riberiro (2018). An AHP software was utilized by the researchers, namely, Expert Choice. Expert choice provides an easy-to-navigate format with product and service details and feedback. A methodical approach to making complex decisions. (Expert Choice, 2021).

4. Data Collection

In order to sustain the information needed in this study, the researchers first seek related literature that will support and help in terms of constructing a questionnaire that will distinguish the leading food delivery app in the Philippines. The items in the questionnaire are comprised of statements related with the factors that consumers is looking on a delivery app namely: availability of food and restaurant choices, security and safety, flexibility of payment methods, availability of promos and offer, accuracy of orders, tracking, scheduling and reordering of orders, delivery fee, speed of delivery, customer service, and lastly the overall customer satisfaction. Google Forms were used in disseminating the questionnaire and were scattered through social media platforms. After getting the required numbers of respondents which is 70% of each variable, the researchers began to organize the gathered data and used statistical methods to summarize and interpret the results of the research.

5. Results and Discussion

5.1 Numerical Results

The researchers accumulated a total of 232 respondents from the disbursement of online questionnaires. This comprised 129 female and 103 males, ranging from ages 13 - 48—constituted mostly of students. Based on the gathered data, there are 81 respondents that preferred using FoodPanda, 78 for GrabFood, and 73 for Pick.A.Roo.

Table 1. Average Scores per Criteria and Alternative

Criteria	Alternative		
	GrabFood	FoodPanda	Pick.A.Roo
Availability of Food and Restaurant Choices	3.55	3.62	2.95
Security and Safety	3.47	3.44	3.70
Flexibility of Payment Methods	3.67	3.73	3.51
Availability of Promos and Offer	3.15	3.36	2.59

Accuracy of Orders	3.65	3.62	3.73
Tracking, Scheduling, and Reordering of Orders	3.71	3.60	3.47
Delivery Fee	3.10	3.23	2.53
Speed of Delivery	2.95	3.27	3.21
Customer Service	3.55	3.36	3.41

In order to identify which alternative is leading per criteria, the average score is calculated. As observed in Table 1, there's a variation among the alternatives in each criteria—sometimes an alternative is performing well in a particular criteria, and at times it doesn't. For example, when it comes to security and safety of data information of consumers, Pick.A.Roo is the prominent alternative, however, it garnered the lowest score when it comes to delivery fee—as this is a premium delivery application, the delivery fee is indeed a bit pricey for an average individual. This variation only proved that in some aspects, delivery companies must assess its services in order to better their system and customer satisfaction.

Table 2. Criteria and Alternative Weight

Purpose	Criteria	Weight	Alternative	Weight
Determine the Leading Food Delivery Application in the Philippines	Availability of Food and Restaurant Choices	0.116	GrabFood	0.220
			FoodPanda	0.648
			Pick.A.Roo	0.122
	Security and Safety	0.200	GrabFood	0.218
			FoodPanda	0.091
			Pick.A.Roo	0.691
	Flexibility of Payment Methods	0.036	GrabFood	0.230
			FoodPanda	0.648
			Pick.A.Roo	0.122
	Availability of Promos and Offer	0.050	GrabFood	0.271
			FoodPanda	0.644
			Pick.A.Roo	0.085
Accuracy of Orders	0.101	GrabFood	0.345	
		FoodPanda	0.109	
		Pick.A.Roo	0.547	

	Tracking, Scheduling, and Reordering of Orders	0.098	GrabFood	0.648
			FoodPanda	0.230
			Pick.A.Roo	0.122
	Delivery Fee	0.024	GrabFood	0.183
			FoodPanda	0.742
			Pick.A.Roo	0.075
	Speed of Delivery	0.306	GrabFood	0.109
			FoodPanda	0.582
			Pick.A.Roo	0.309
	Customer Service	0.071	GrabFood	0.571
			FoodPanda	0.143
			Pick.A.Roo	0.286
	Inconsistency	0.08		

Table 2 showed the weights of alternatives per criteria, as well as the criteria's weight. Since there's a variation in average score of alternatives, discrepancies are also observed among the weights of alternatives per criteria. Overall, to achieve customer satisfaction and retainment, these food delivery companies must take into account that delivery time is the significant factor consumers are considering when availing a delivery service as they want the service to be quick. Next is the security and safety of the personal data they've inputted in the application especially that identity theft is common in the modern era. Availability of food and restaurant choices fall in the third considerable factor. As for the least significant factor, the majority of the respondents are unconcerned of the price of the delivery fee as long as they'll be receiving quality service and food.

Table 3. Overall Alternative Weight

Alternative	Weight	Priority
FoodPanda	0.389	1
Pick.A.Roo	0.343	2
GrabFood	0.268	3

Table 3 presented the overall weight as well as the ranking of the three alternatives. These were obtained by analyzing the gathered data from the respondents and utilizing Analytical Hierarchy Process (AHP) through the Expert Choice software. With a weight of 0.389, the results showed that FoodPanda received positive feedback and the consumers were satisfied with their service. The second was Pick.A.Roo that accumulated a weight of 0.343. Meanwhile out of the three alternatives, GrabFood garnered the lowest weight of 0.268, which signifies that their service does not meet the customer satisfaction.

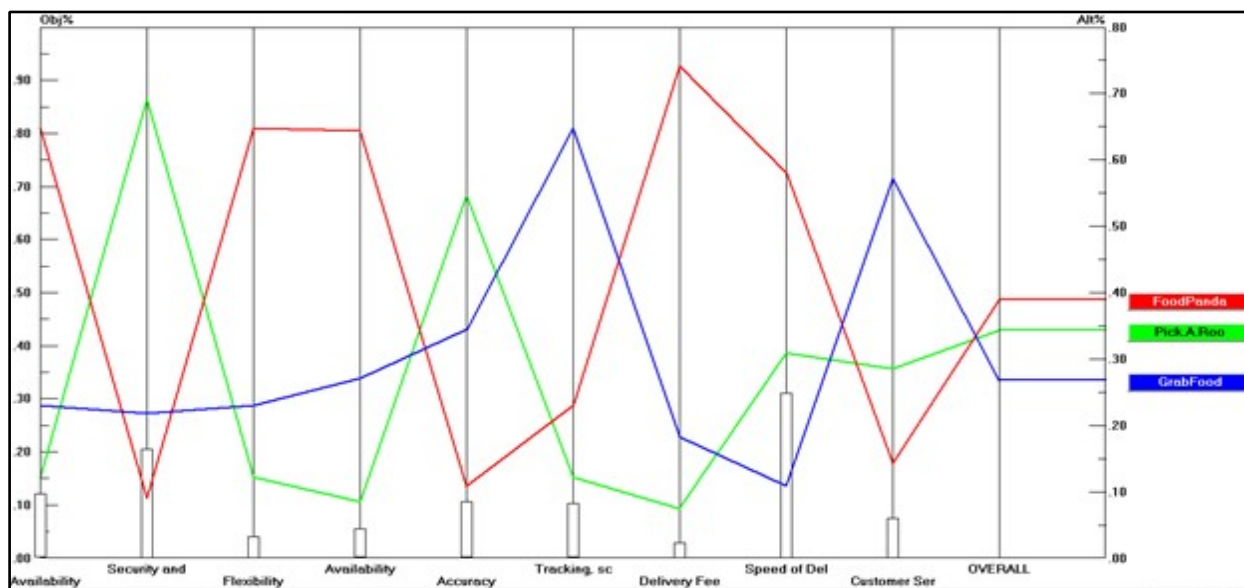


Figure 1. Performance Sensitivity Graph GrabFood vs. FoodPanda vs. Pick.A.Roo

5.2 Graphical Results

Figure 1 showed the summary of numerical results in a graph form wherein fluctuations among the criteria in each alternative is observable. As noticed, in some areas, an alternative leads to providing a service, and sometimes it's insufficient. The weights per criteria is also evident in the graph wherein it resulted that speed of delivery is the significant factor being considered by the customers, and delivery fee as the least factor. The graph also showed the ranking of the alternatives that fulfilled the satisfaction of customers—FoodPanda as the leading food delivery application; although new in the platform, Pick.A.Roo ranked second to providing quality service, and GrabFood as the least preferable.

5.3 Proposed Improvements

In terms of the 3 companies weighted result in the data, they should continuously manage and update their applications to address the problems and improve it more. For example, in terms of tracking orders and reordering statuses, the companies should upgrade the application's interface and feature to make it smooth and user-friendly to improve that specific factor. As the world is quickly evolving, technology is also getting better and the competition in the market is becoming stricter. In order for the 3 companies to stay on top as the best food delivery application, they must listen to their consumer's advice and rating. Conducting a monthly survey would help them address different concerns. In terms of having a general factor in this research study, additional specific factors must be included in order for the respondents to clearly pinpoint their concern. Adding factors such as price of the products, interface of the application, condition of food delivered and difficulty in using the applications would help determine the best food delivery application. Even though the data would be longer and more specific, adding factors will expand the possibilities of their limitations.

5.4 Validation

Panse et al. (2019) introduced various advantages of OFD applications. Firstly, they are less costly than traditional service providers; in particular, they provide extra benefits to regular users, rendering them affordable to people in the middle and lower middle classes. Consumers can earn bonus points by using the smartphone ordering app. This allows customers to use the app more often and order with greater discounts which means that there is a positive effect of customer satisfaction with the presence of discounts and coupons. Time flexibility; their services are accessible wherever and wherever a customer desires. They also have a variety of payment solutions, such as cashless payments and cash on request, for customers to select from. The low-cost conditions, convenience and flexibility, have been the biggest value creation for these online food delivery platforms. The retail industry underwent a paradigm change in

the first decade of the twenty-first century. This is due to the development of internet-based technologies, which has aided in the rapid growth of the e-commerce sector. From traditional retailing to e-retailing, the whole world of retailing has shifted. The widespread usage of smartphones by ordinary citizens in the second decade of the twenty-first century gave rise to M-shopping, a modern phenomenon of online shopping. It was made possible thanks to user-friendly smartphone applications that used 4G/Wi-Fi technologies. Researchers from all around the world have been studying the phenomenon of mobile retailing and the usage of smart technologies. Figure 2 refers to the business model for restaurants incorporating themselves to OFD applications.

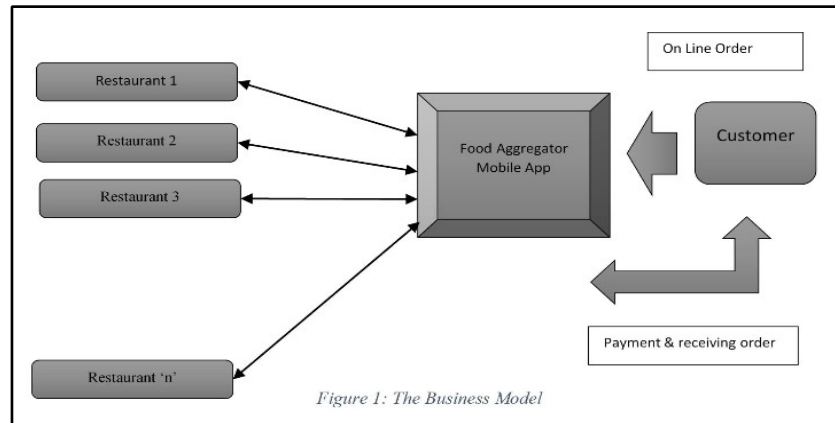


Figure 2. The Business Model (Panse et al., 2019)

Figure 2 (Panse et al., 2019) explains the food aggregator has partnered with a number of restaurants and hotel chains to deliver food on sale. The food aggregator must have a user-friendly smartphone interface as well as physical logistics for the food. The researchers have obtained all weighing factors with the help of research projects found in Google Scholar. Keywords such as online food delivery (OFD), customer satisfaction, and behavioral intentions of consumers are the main terms that the researchers were able to use when figuring out evidence and validation for each weighing factors that affect consumer's satisfaction towards OFD applications. These are highly reasonable and proven by researchers found in different papers. They provided hypothetical testing alongside conceptual models that could act as a guide on how to execute the research project as efficiently as it can be. This was also done to prove which among these criteria or factors highly affect customer satisfaction. The researchers used an AHP software called Expert Choice. For some other research projects, they have executed their analysis and AHP method using a different software besides Expert Choice. According to this report by Suhartanto (2018), making a high-quality e-service is critical. Food, such as pizza, is common in the online world. Other goods advertised on the internet are intangible. In contrast to the norm, consumers using OFD platforms are unable to taste, contact, detect, or see the food offered. Rather, customers judge the standard of food based on the image and the information provided in the platform or web page. As a result, in order to optimize the degree of customers' trust can be earned by providing simple and understandable information. Therefore, the proposed improvements must be performed to ameliorate all the missing gaps that a particular OFD application needs.

6. Conclusion

Evidence of emergence and increased popularity of OFD applications have been dictated under the review of related literature. It has been proven that over the years to come OFD applications will prevail rapidly. With the existence of the COVID-19 pandemic it is much more evident that OFD applications are being utilized by various consumers, especially individuals or households experiencing lockdowns. As it is indeed very useful and convenient for all the consumers around the world.

Its objective is to spread awareness to all OFD application owners and as well as to determine which among these factors have the heaviest weighing factor. The proposed improvements already have indicated what the best solutions for such gaps are. This is something that's for all OFD applications out there that needs to increase their profit and income especially for motor riders that deliver from door-to-door. Motor riders' income can be highly effective towards one's OFD application performance level. It is necessary somewhat mandatory to comply with all the proposed improvements that this study has provided. The best alternative amongst the three OFD applications is seen

to be FoodPanda, Pick.A.Roo comes second, and third comes GrabFood. FoodPanda has already met all customer's wants to experience a satisfying moment with this OFD application. However, there were three main criterions that made FoodPanda come at second and third. Security and safety, accuracy of orders, and customer service. This is due to the fact that Pick.A.Roo is known to be a premium application and they provide systems that makes all information in tacked together without any leaks. There were instances wherein FoodPanda does not deliver the goods in a certain destination with complete orders. Some would be disappointed with the fact that customers already placed remarks about adding extra condiments, but the delivery man was not able to see nor do this. Customer service was voted last under FoodPanda, perhaps this might be the reason of having slow replies towards customer and does not meet their satisfaction. This time, GrabFood runs first for customer services, which means that they provide all the necessary information and was able to approach customers in a speedy manner. The heaviest weighing factor for the criterion amongst the three are delivery time, second comes the security and privacy of one's personal information revolving around the OFD application, and third comes the availability of food and restaurant choices. Perhaps the reason for having the heaviest weighing factor for delivery time is the traffic congestion in the Philippines.

Business World, Balinbin (2021) reports that Manila's traffic congestion dropped drastically because of the COVID19 quarantine yet according to a position technology business, Manila remains the fourth-most congested city in the world. Consumers highly depend on these OFD applications to be delivered at their doorstep as fast as these delivery drivers could, to feed hungry consumers. But with the traffic congestion in the Philippines consumer's satisfaction highly becomes affected towards consumer's satisfaction. Next, privacy and security, almost all the citizens of the Philippines know the danger of E-commerce especially when it comes to payment information and personal information in various online shopping applications as well as OFD applications. In today's situation, customers must be mindful of theft, cheating, and stolen card identities, as well as low quality products and services.

References

- Bates, S., Reeve, B., and Trevena, H. (2020). A narrative review of online food delivery in Australia: Challenges and opportunities for public health nutrition policy. *Public Health Nutrition*, 1-11.
- Belanger, F., Hiller, J. S., & Smith, W. J. (2002). Trustworthiness in electronic commerce: the role of privacy, security, and site attributes, *The Journal of Strategic Information Systems*, 11(3-4), 245-270.
- Caña, P. J. (2020, July 28). Megaworld's Kevin Tan and Former Honestbee PH Boss Join Forces on New Premium Delivery App. Retrieved May 12, 2021, from Esquire: <https://www.esquiremag.ph/money/industry/pick-a-roonew-delivery-app-launch-a00289-20200728>
- Chai, L. T., and Yat, D. N. C. (2019). Online food delivery services: making food delivery the new normal. *Journal of Marketing advances and Practices*, 1(1), 62-77.
- CHETAN PANSE, D. S. R., SHARMA, A., & DORJI, N. (2019). Understanding consumer behaviour towards utilization of online food delivery Platforms. *Journal of Theoretical and Applied Information Technology*, 97(16).
- Domingo, R. W. (2020, December 7). Delivery services see big, small businesses through pandemic. *INQUIRER.net*. <https://business.inquirer.net/313372/delivery-services-see-big-small-businesses-through-pandemic>.
- Expert Choice Inc. (2021). Leader in AHP Decision Software Since 1983. <https://www.expertchoice.com/analytichierarchy-process-experts>.
- Flavián, C., & Guinalú, M. (2006). Consumer trust, perceived security and privacy policy: three basic elements of loyalty to a web site, *Industrial Management & Data Systems*, 106(5), 601-620.
- Hu, H. H., Kandampully, J., & Juwaheer, T. D. (2009). Relationships and impacts of service quality, perceived value, customer satisfaction, and image: An empirical study. *The Service Industries Journal*, 29(2), 111-125. doi:10.1080/02642060802292932
- Ibañez, J. (2021, April 15). Lockdown helps foodpanda take 70% market share. Retrieved May 13, 2021, from Business World: <https://www.bworldonline.com/lockdown-helps-foodpanda-take-70-market-share/>
- Juneja, P. (n.d.). MSG Management Study Guide. What is Analytical Hierarchy Process (AHP) and How to Use it ? <https://www.managementstudyguide.com/analytical-hierarchy-process.htm>.
- Kalakota, R., & Winston, AB. (1997). *Electronic Commerce: A Manager's Guide*, Pearson: USA.
- Kennedy, E. and Kundu, G. (2018). Influence of Delivery charges and Time on Online Purchase Decision. *International Journal of Pure and Applied Mathematics*, 118(18), 4393-4404.
- Lee, E.-Y., Lee, S.-B., and Jeon, Y. J. J. (2017). Factors influencing the behavioral intention to use food delivery apps. *Social Behavior and Personality: An International Journal*, 45(9), 1461-1473. doi:10.2224/sbp.6185
- Natarajan, C., Gupta, S., & Nanda, N. (2019, June 12). Food Delivery Services and Customer Preference: A Comparative Analysis. 12. Bangalore, India. *Journal of Foodservice Business Research*. Retrieved May 13,

- 2021, from Biology Dictionary:
https://www.researchgate.net/publication/333742204_Food_Delivery_Services_and_Customer_Preference_A_Comparative_Analysis
Nayan, N. M., & Hassan, M. K. (n.d.). Customer Satisfaction Evaluation for Online Food Service Delivery System in Malaysia. Malaysia. *Journal of Information System and Technology Management* Retrieved May 13, 2021, from Learn Religion:
https://www.researchgate.net/publication/347652149_CUSTOMER_SATISFACTION_EVALUATION_FOR_ONLINE_FOOD_SERVICE_DELIVERY_SYSTEM_IN_MALAYSIA
Neil, & Balinbin, A. (2021, January 13). *Traffic congestion in Manila is 4th worst in the world despite lockdown*. BusinessWorld. <https://www.bworldonline.com/traffic-congestion-in-manila-is-4th-worst-in-the-world-despitelockdown/>.
Nguyen, D., De Leeuw, S., Dullaert, W., and Foubert B. (2019). What Is the Right Delivery Option for You? Consumer Preferences for Delivery Attributes in Online Retailing. *Journal of Business Logistics*, 40(4), 299–321. doi: 10.1111/jbl.12210
Passage Technology. (2021). *What is the Analytic Hierarchy Process (AHP)?*: Passage Technology. Trusted Salesforce service partner Passage Technology. [https://www.passagetechnology.com/what-is-the-analytichierarchyprocess#:~:text=The%20Analytic%20Hierarchy%20Process%20\(AHP\)%20is%20a%20method%20for%20organizing,has%20been%20refined%20since%20then](https://www.passagetechnology.com/what-is-the-analytichierarchyprocess#:~:text=The%20Analytic%20Hierarchy%20Process%20(AHP)%20is%20a%20method%20for%20organizing,has%20been%20refined%20since%20then).
Rahman, H.U., Ashraf, M., Abrar, M., & Mehmood, A. (2019). A Review of the Usable Food Delivery Apps. *International Journal of Engineering Research*. 8(12).
Ribeiro, C. (2018). Technology at the table: An overview of Food Delivery Apps. Retrieved May 13, 2020, from https://repositorio.ucp.pt/bitstream/10400.14/26991/1/Thesis_PDF_A_CatarinaJardimRibeiro.pdf
Saad, A. T. (2019). *Factors affecting online food delivery service in Bangladesh: an empirical study*. Retrieved from Research Gate:
https://www.researchgate.net/publication/344220614_Factors_affecting_online_food_delivery_service_in_Bangladesh_an_empirical_study
Song, Y., Jeon, S., and Jeon, M. (2016). The Effect of Mobile Food Delivery Application Usage Factors on Customer Satisfaction and Intention to Reuse. *Culinary Science & Hospitality Research*. 23(1). 37-47. DOI: 10.20878/cshr.2017.23.1.005
Suhartanto, D., Helmi Ali, M., Tan, K. H., Sjahroeddin, F., & Kusdibyo, L. (2018). *Loyalty toward online food delivery service: the role of e-service quality and food quality*. *Journal of Foodservice Business Research*, 1–17. doi:10.1080/15378020.2018.1546076
Survey: GrabFood is Filipinos' preferred online food delivery platform. (2019, April 22). Retrieved May 13, 2021, from F&B Report: <https://fnbreport.ph/news/survey-grabfood-is-filipinos-preferred-online-food-deliveryplatform-admin-20190422/>
Tribhuvan, A. (2020, July). *A STUDY ON CONSUMERS PERCEPTION ON FOOD APPS*. Retrieved from Research Gate:
https://www.researchgate.net/publication/342765294_A_STUDY_ON_CONSUMERS_PERCEPTION_ON_FOOD_APPS
Yang Zhilin, M. J. (2002). Consumer Perception of E-service Quality: From Internet Purchaser ana Non-purchaser Perspectives. *Journal of Strategy*, 19(1), 19–41.

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