

ONLINE IMPRESSIONS ON E-HAILING SERVICES:
A STUDY OF POSITIVE AND NEGATIVE
SENTIMENTS ON GRAB MALAYSIA AND GO-JEK
INDONESIA ON TWITTER PLATFORM

BY

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LIST OF ABBREVIATION

EVP	E-hailing Vehicle Permit
MeHDA	Malaysian E-hailing Drivers Association
PSV	Public Service Vehicle
SERVQUAL	Service Quality
SMEs	Small and Medium Enterprises
TSQD	Transportation Service Quality Dimension
TSQM	Transportation Service Quality Model

PREFACE

This study focuses on identifying the online sentiments regarding customer satisfaction on e-hailing services in both Malaysia and Indonesia. Relevant tweets were filtered using keywords then classify into either positive or negative sentiments, and into 6 dimensions from Transportation Service Quality Model proposed by Alamsyah and Rachmadiansyah (2018) namely: ‘availability’, ‘accessibility’, ‘information’, ‘comfort’, ‘safety’, and ‘price’. Follow by the increase in ridership leads to the demand in better service quality. As the number of complaints lodged against the e-hailing services increase. Besides, this study also focuses on identifying the differences on online sentiments regarding customer satisfaction between both Malaysia and Indonesia e-hailing services. This is to study on which dimension under the proposed model is concerned the most by the riders in both countries. Therefore, it is necessary to study on the rider opinions towards the services in order to increase the service quality provided.

ABSTRACT

The presence of mobile-internet has leads to the emergence of e-hailing industry. The increase usage in e-hailing services has led riders to share their opinions or discontent after indulging in the services. Therefore, in this study, online sentiments on social media (Twitter) were examined to identify the rider opinions towards the e-hailing services in both Malaysia and Indonesia. Service Quality (SERVQUAL) model was used as the foundation to examine the service quality offered by the e-hailing service providers. The dimensions used were: 'availability', 'accessibility', 'information', 'comfort', 'safety', and 'price'. All the data collected were classified into either a positive or negative sentiment, and the results revealed that all the dimensions show a negative trend in both countries. 'Comfort' and 'availability' was ranked the first in Malaysia and Indonesia respectively. The result showed riders concerned the most the in dimensions of 'availability' and 'comfort' due to riders demanded an e-hailing service that is available anywhere and anytime when they need it. The study results provide a strong reference to practitioners to improve on their service quality and allowed to identify which dimensions were concerned the most by the riders in both countries.

CHAPTER 1: RESEARCH OVERVIEW

1.1 Research Background

The ride-sharing service was first pioneered by Lyft, which founded in 2007 but launched its app only in 2012. However, Uber started in the year 2010 in San Francisco (Chaudhry, Yasar, El-Amine, & Shakshuki, 2018). To offer chauffeur-driven black cabs to corporate customers was the main idea proposed by Uber. Septiani, Handayani, and Azzahro (2017) state that the way people obtain transportation services has changed due to the presence of online transportation services, through the utilization of smartphone and the advancing of technology that ease the accessibility to the Internet. There are several names for online transportation services such as ride-hailing or ride-sharing, while in Malaysia, it is commonly known as e-hailing service.

The ubiquitousness of Internet-enabled mobile allows the dynamic of e-hailing services. The effective use of the under-utilized vehicle by e-hailing services presents an opportunity to increase the occupancy rates, in turn, increase the efficiency of the public transportation systems (Agatz, Erera, Savelsbergh, & Wang 2009). In fact, the issue of traffic congestion can be minimized. E-hailing service allows both drivers and the riders to be informed with each other's location and enable them to know about the real-time situation of the traffic in a specific area (Farin, Rimon, Monen, Uddin, & Mansoor, 2016). These features led e-hailing to have greater advantages compared to those existing traditional transportation services such as public buses or taxis. It is more convenient and efficient to take the service of vehicles without having to wait for those "not on time" traditional public transport (Mead, 2016). Generally, e-hailing service has become a necessity, especially for those consumers that keen on mobility. Therefore, when the rides demand increase, the demand for quality service will also increases.

With the rising awareness of e-hailing services, service quality (SERVQUAL) provided by the e-hailing service companies needed to be improved to gain competitive advantages over other service providers. Riders often share their reviews or experiences on social media after using a product or service.

Twitter is a popular microblogging platform that frequently used by the customers to create a status message, or often called tweet (Go, Bhayani, & Huang, 2009). It allows users to share and discuss various topics with anyone who is also using Twitter without requiring the consent of both parties. It has become a platform for both customers and service providers to discuss on various issues (Harrison, 2019). According to Anastasia and Budi (2016), business organizations used Twitter as a platform to support their business operations or as a tool to engage with their customers. This is because Twitter acts as a room for customers to share their opinions or comments, and allows companies to get feedback and improve on their services or products provided, by observing and evaluating the sentiments or responses. Due to the ability to provide information in a real-time manner, most e-hailing service providers such as Grab and Go-Jek are currently using Twitter as their official social media platform to reply customers on their inquiries or complains. Through analyzing user's reactions, tweets can be further study by classifying them using a categorize model proposed by Alamsyah and Rachmadiansyah (2018) based on Transportation Service Quality Model (TSQM) by modifying the Customer Satisfaction Index proposed by Poliakova (2010), which adapted from the SERVQUAL model. The main elements are used to categorize online sentiments.

The sentiment analyses can be used by the customer as a reference when choosing a product or service (Go et al., 2009). Users may find out the best or well-accepted e-hailing service providers by knowing the sentiments. It also frequently used by marketers to study in-depth on the public opinion towards their company then measure customer satisfaction. Therefore, problems and crises may be eliminated by understanding public sentiments and making improvements.

1.2 Problem Statement

Due to the advancing of technology, the usage of mobile application for ride-hailing service increases. E-hailing provides an alternative means to traditional public transport, which preferred by many users especially in areas where traditional public transports are difficult to access (Windasari, Uzzi, & Satoto, 2017). With the dramatic rise in the use of e-hailing service, the demand of better service quality is expected as well. However, The Star Online (2018) reported that the number of complaints lodged against the e-hailing services has dramatically increased. Issues such as price hikes, unsatisfactory service, imbalance supply and demand for transportation services, and passenger safety are frequently discussed by the users on social media. In order to cater such issues, both compliments and complaints were actively given through prominent social media platforms.

In 2019, along with the implementation of new e-hailing regulations in Malaysia, the Malaysian E-hailing Drivers Association (MeHDA) have foreseen a striking increase in fares and longer waiting time due to the expected reduction of driver availability (The Star Online, 2019). Thus, with lesser drivers to serve increasing demand, negative trends of online sentiment towards e-hailing service may be expected after the implementation of new regulations.

More and more riders share their experiences on social media platforms such as Twitter after indulging in the services. Twitter is a platform that allows users to share their feedback and feelings regarding a product or service. The feedback posted consists of different opinions about the service, and the service providers will interact with the users' discontents or complaints occasionally to understand the reasons behind those dissatisfactions. The sentiment expressed online may serve as a yardstick in measuring the contentedness of riders towards the services. By reading those tweets, the public will be able to understand the status or development of e-hailing services based on online sentiments. Therefore, it becomes necessary to study the online sentiment of the users, and it act as a reference for the consumers before making a purchase, or marketers that would like to analyze the customer

satisfaction towards their products or services provided to improve their service quality (Saragih & Girsang, 2017).

1.3 Research Question

Based on the problem statement, the research questions are as follows:

1. What is the online sentiment regarding rider's satisfaction on Malaysia's e-hailing services?
2. What is the online sentiment regarding rider's satisfaction on Indonesia's e-hailing services?
3. What are the differences in the online sentiment regarding rider's satisfaction between Malaysia and Indonesia's e-hailing services?

1.4 Research Objective

1.4.1 General Objective

The objective of this study is to analyze the online sentiment regarding customer satisfaction on e-hailing service in both Malaysia and Indonesia by classifying the tweets using Transportation Service Quality Model adapted from SERVQUAL model.

1.4.2 Specific Objective

1. The purpose of this study is to identify the online sentiment regarding rider's satisfaction on e-hailing services in Malaysia. (i.e. positive and negative sentiment)
2. The purpose of this study is to identify the online sentiment regarding rider's satisfaction on e-hailing services in Indonesia. (i.e. positive and negative sentiment)
3. The purpose of this study is to identify the differences in the online sentiment regarding rider's satisfaction on e-hailing services between both Malaysia and Indonesia.

1.5 Scope of Study

Grab Malaysia and Go-Jek Indonesia will be the main focus in this study as they are the dominant player of the industry in both countries. There are other e-hailing service providers in the market, however, tweets or sentiments regarding those platforms are too little. The Star Online (2018) states that Grab has become the sole dominant player ever since Uber quitted the Southeast Asia market. The land public transport agency received tremendous complaints on Grab due to the surge in fares, said a ministry. On the other hand, a study claimed that most of the e-hailing orders made through Go-Jek's application in Indonesia may be fraudulent, while some of the Grab orders in the country could be unreal (Ellis, 2019). Thus, it is necessary to study the users' sentiments towards the e-hailing service in their country.

1.6 Significance of Study

By conducting this study, all the service providers can understand the user opinions towards the e-hailing service in both Malaysia and Indonesia. The result of this study may also serve as a reference for various service providers to improve their service quality. The new model proposed will be able to provide a new perspective of service quality specify on the e-hailing industry. Moreover, service industry may improve on their service quality according to the model proposed, to identify which dimension concerned the most by the customers.

1.7 Chapter Layout

There are 5 chapters in this study. Chapter 1 explains the background, defining the problem statement, research objectives, and questions. In Chapter 2, it first started with a broad introduction of e-hailing service, then analyse the literature regarding the Transportation Service Quality Dimensions. Next, Chapter 3 states the research method and approaches used to conduct this study, while Chapter 4 discusses the results and analysis regarding the online sentiments of the users towards the services in both Malaysia and Indonesia. Lastly, Chapter 5 will summarize the whole study.

CHAPTER 2: LITERATURE REVIEW

2.1 E-hailing Service

Online transportation service is also known as ride sharing or e-hailing service, which is well-known and well-accepted in most of the developed countries (Silalahi, Handayani, & Munajat 2017). Users and drivers are connected through the e-hailing platform in real-time. This service is heavily dependent on technology, both directly and indirectly, where users can order a ride via the mobile application and the driver will then respond through the applications. In a research where Septiani et al. (2017) states that e-hailing service is a well-known transportation service in which traditional public transport service is being modernized through the implication of technology. All the activities can be done online by using a smartphone, including ordering a car, initiating a payment, selecting the desired location and so on. Besides that, users are also able to find the driver's information via the mobile application to encourages the safety of the passenger during their trip (Septiani et al., 2017).

Users can use the e-hailing services by simply downloading the e-hailing mobile application on their smartphone, and the order can be placed through the application (Damaini, Nugroho, & Suyoto, 2018). In the mobile application, users can know who will be the driver that pick them up, and the exact location of both users and drivers. Although the e-hailing mobile applications are constantly being improvised to support public's convenience in daily life, however, social externalities cannot be ignored namely, illegal car-hailing and safety concerns of both riders and drivers (Ma, Li, Wu, & Yan, 2018). Moreover, transaction security is also an issue that frequently raised by the users on the Twitter official page, where some dishonest drivers exploit the loopholes contained in the mobile application (Damaini et al., 2018).

2.1.1 E-hailing Malaysia

After Uber left the Southeast Asian market, consumers afraid that Grab will monopolize the whole e-hailing market (Ariffin, 2018). However, several startups can be seen to have entered the e-hailing market in a desire to fight for the opportunity in the markets. There is a total of forty-one alternatives that can be found in Malaysia and among the popular e-hailing alternatives are Grab, MyCar, EzCab, and Ryde (Lim, 2019).

MyCar was developed by Platform Apps Sdn Bhd and went live in February 2018, with a 10 to 20% market share, was hailed by some media reports that it is the next best alternative to Grab. There was a comparison made between MyCar and Grab by an independent personal financing website, the result shows that MyCar has a cheaper alternative in terms of travel cost (Ariffin, 2018). However, the disadvantage is that MyCar only accepts cash payment while Grab has started their cashless payment via credit or debit cards.

Another alternative is EzCab, which was developed by EzCab Sdn Bhd. Transportation services such as taxis, private cars, luxury Multi-Purpose Vehicles (MPVs) are offered and one of the interesting and useful features of EzCab mobile application is the in-app SOS button (Khidhir, 2019). Once the panic button was pressed, the exact location of the user, service, or any authorities who attended the order will automatically be displayed.

Ryde is also an alternative developed by Vertec Technology Solution Sdn Bhd, that can be found in Malaysia. There are two special services provided by Ryde: RydePet and RydePool. If users wish to travel with their pets, users may select the RydePet service while RydePool offers a truly cost-efficient travel method, which is carpooling, then uses a GPS algorithm to determine the amount each passenger has to pay at the end of the ride (Khidhir, 2019).

Furthermore, the Malaysia government is also exploring an option to bring Go-Jek into the Malaysia market. The intention to introduce Go-Jek into

Malaysia is to create job opportunities for the motorcyclist, and Small Medium Enterprises (SMEs) as well, said the Youth and Sports Minister, Syed Saddiq Syed Abdul Rahman (Jamil, 2019). However, it is still pending for religious approval.

2.1.2 Grab Malaysia

Among all the alternatives of e-hailing service found in Malaysia, Grab is most used by the local riders and is currently the dominant player in the e-hailing industry. Grab is an e-hailing service provider developed by GrabTaxi Holdings Pte. Ltd. and has acquired all Uber's operations since Uber quitted the Southeast Asia market (The Asean Post, 2019). According to Grab (2019), Grab was started by a few friends in the year back to 2012. After that, they have decided to solve the problem of how hard it was for everyone to get a taxi, then came out of the idea of Grab and followed by MyTeksi. Today, Grab is now one of the largest e-hailing service providers present in eight countries across the region.

Grab offers two varieties of GrabCar services: GrabCar and GrabCar+ (Grab, 2019). There are several measures implemented by Grab such as screening, training, implementation of Code of Conduct, innovate safety features, provide insurance and 24/7 support to ensure that all the users deserved a safe transportation platform (Grab, 2019). 24/7 call centres and emergency response teams are provided to ensure that the users are safe in any condition while using their transportation services.

Grab aims to provide everyone to have access to transportation especially urban areas with a higher concentration of populations, such as Klang Valley, Johor Bahru, Penang, Kota Kinabalu, and Malacca. Therefore, they offer different choices of rides with all fairly priced, and even door-to-door transportation which caters to someone with special needs. The most important aspect is that Grab offers anywhere, and anytime transportation

service. The fares for Grab are charged on a fixed rate basis, and there are no additional charges at midnight, but all the toll charges needed to be borne by the passengers.

In a nutshell, Grab wants everyone in Southeast Asia to be able to travel safely, comfortably, easy to travel to places they want and to bring people for a better lifestyle. Thus, Grab's vision is to be an application used by Malaysian consumers every day.

2.1.3 E-hailing Indonesia

Go-Jek, Grab, Uber, BajajApp, Bangjek, Transjek, Wheel Line, and Blue-Jek are the popular e-hailing service providers in Indonesia (Silalahi et al., 2017). Based on a survey conducted by ecommerceIQ reported by The Jakarta Post (2018) and Prabowo (2018), Go-Jek, Grab, and Uber are among the most preferred e-hailing service provider. However, Uber has quitted the Southeast Asia market. One of the reasons why Indonesia prefer using Go-Jek and Grab is because the attractive insurance coverage offered.

The Jakarta Post (2018) also states that availability of drivers is the second popular reason, followed by price incentives such as promotions and discounts, accessibility of the services, and different payment options provided by the e-hailing service providers. However, the e-wallet features in the e-hailing mobile application did being used widely apart from the application's services.

2.1.4 Go-Jek Indonesia

Go-Jek was founded in year 2010 and started the hype of e-hailing services in Indonesia, (Silalahi et al., 2017). It is Indonesia's first unicorn, but is now a 'decacorn', which means it holds a value or more than US\$ 10 billion (The

Asean Post, 2019). A challenge was presented to Grab by as Go-Jek is planning to expand their business to other Southeast Asia market such as Singapore, Philippines, Thailand, and Vietnam stated by Subhan in The Asean Post (2018).

According to Go-Jek (2019), the mission of Go-Jek is to improve the income of local ojek, which is the motorcycle-taxi. At the beginning, drivers and riders were 'matched' manually via a call center, but then a mobile application was launched to automate the match making.

Ojek was an unofficial public transport using motorbikes that were rented by the passengers in Indonesia (Damaini et al., 2018). Most of the Indonesian prefer using *Ojek* service due to its faster mobility as compared to other transportation service, which are using car transportation. Daimaini et al. (2018) also mentioned that getting more users are interested in motorcycle-taxi is due to their cheaper price. The fares of this e-hailing service are calculated using algorithm that based on distance and the rush hour traffic. At some point of time, users were given promo code when using their service. This makes the process of ordering an e-hailing service cheaper and more convenient.

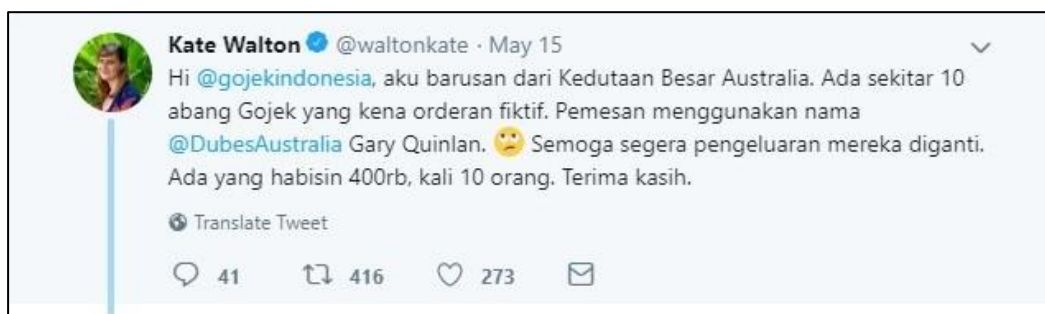
2.2 Twitter

Twitter is a microblogging platform, where users are allowed to post their real-time reactions and opinions about everything (Agrawal, Xie, Vovsha, Rambow, & Passonneau, 2011). As a result of short texts and simplified communication, all the information update can be processed faster. Those short texts are also known as tweets. Characterizing the tweets is important for data analysis, then become useful content for various interested parties. There are several characteristics of tweets classified by Go et al. (2009), which are length, domain, data availability, and language model. In terms of length, users are only allowed to post 140 characters tweets. Variety of topics were posted by users in the form of short messages, and

the most discussed topics on Twitter is the e-hailing services (Windasari et al., 2017). Due to e-hailing services are being widely discussed by the users on Twitter, thus it is more convenient and easier to collect thousands of tweets for the research. Alamsyah and Rachmadiansyah (2019) mentioned that collecting opinions through an online platform is more convenient and time-saving as compared to those previous approaches which mostly based on distributing questionnaires or conducting personal interviews. Moreover, the language of this microblogging service can be used informally, and Twitter is allowed to access not only via personal computers but also through mobile-phones, are the reasons that cause the chances of words being misspelt and slang used in tweets is greater than other domains (Go et al., 2009).

There are several types of accounts on Twitter such as ‘verified’ accounts (refer to Figure 2.1), individual accounts or accounts belong to news agencies, corporations, or government units. Those ‘verified’ accounts on Twitter were examined and evaluated that they do indeed belong to whatever public figure claims them (Carley, Malik, & Kowalchuk, 2015). This verification purpose does let other users know that the account is taken by whichever figure or entity that they claim to represent. Moreover, the verification also serves a research purpose where people know that these ‘verified’ accounts are guaranteed not bots, but may be account to celebrities or any government agencies. Therefore, tweets posted by these ‘verified’ accounts may be more reliable compared to those normal individual accounts.

Figure 2.1: Example of Verified Twitter Account



Source: Walton (2019)

Most of the companies used Twitter as a platform to interact with their customers. Users commonly share their experiences and discontents on their Twitter account. A research conducted by Lima and Castro (2012) states that many companies see Twitter as an important online platform to monitor the ongoing trends and to promote their products. Therefore, Twitter post (tweets) allows companies and marketers to understand their customer's behaviours and the changes happening in the market environment through monitoring of online sentiment regarding the tweets posted. However, Twitter's short character limit also raises a problem to sentiment analysis due to the restriction on the number of characters that can be inputted for a review (Amplayo & Song, 2016).

2.2.1 Twitter Usage in Indonesia

Twitter has been adopted by Indonesian in the early stages and they may be considered as the most prolific Twitter users (Carley et al., 2015). Thia (2010) reported in ZDNet that the country with the highest Twitter penetration was Indonesia, followed by Brazil and Venezuela. Besides that, the comScore report (2010) written by Hartzel also mentioned the Twitter penetration of Indonesia reaches 20.8%, which is the highest among all the countries worldwide. In the same year, a CNN news titled 'Indonesia:

Twitter nation' reported by Sidner (2010) also says that the percentage of online Twitter users had beat every other nation in the world.

2.2.2 Twitter Usage in Malaysia

Malaysia has the highest mobile social media penetration among the Southeast Asia countries. "Social media is the main interaction medium used by Malaysian (96.5%) through the Internet to access to their social media website last year," said Chief Statistician Datuk Seri Mohd Uzir Mahidin (Malay Mail, 2019). Most of the Malaysian spent a daily average of eight hours online, and Twitter (23.8%) is one of the most used social media platforms (New Straits Times, 2019). According to ExpatGo (2014), there were a total of 3.5 million Twitter users in Malaysia, and an average of 5.4 million tweets was sent by the users per day. The total number of tweets sent were much higher compared to the users from Thailand, which was a total of 4.5 million tweets sent per day.

2.3 Online Sentiment

Researchers can study consumer feelings toward a particular product or service through extracting and classifying the online sentiments posted on social media (Cham, Lim, Aik, & Tay, 2016; Cheah, Ting, Cham, & Menom, 2019). These online sentiments allowed service providers to monitor brand attitudes and emerging trends in their respective markets (Rambocas & Pacheco, 2018). From the perspective of consumers, by reviewing the online sentiment allows them to decide whether to choose the presented product or services. Meanwhile, service providers investigate the online sentiments to maintain on the positive aspects and improvise on the negative ones to serve the markets better (Amplayo & Song, 2017). Moreover, online sentiments were also used by different companies as a tool to evaluate the engagement between customer and company.

2.3.1 Sentiment Analysis

Sentiment analysis is a technique where the purpose of a classification task is to assign a category according to the sentiment expressed in a tweet (Lima & Castro, 2012). It also refers to the evaluation and classification of attitudes and opinions on a specific topic of interest (Rambocas & Gama, 2013). The purpose of sentiment analysis is to understand how interested parties interpret the emotion within the tweets. Wang and Wan (2011) mentioned that sentiment analysis is widely employed by researchers to extract opinion from the web and to determine whether a sentiment expressed in a tweet shows a positive or negative connotation. Those tweets will then be classified into different categories using TSQM. Due to the tweets have informal nature, being used to discuss a variety of topics, and the length is short, these lead to sentiment analysis of tweets require greater efforts from the classifier (Lima & Castro, 2012). Furthermore, some tweets are ambiguous to a human classifier and thus become one of the challenging aspects of sentiment analysis.

Sentiment analysis is conducted mainly to determine the true meaning of the writer. A similar technique was employed Gamon (2004) in research to analyse the feedback data from the Global Support Services survey. The purpose of his research was to analyse the role of a linguistic feature. In this research, public sentiments information can be identified through monitoring the tweets, and knowing the sentiments allows to determine which SERVQUAL dimensions are most concerned by the users. (Windasari et al., 2017). Rambocas and Pacheco (2018) mentioned that the ability to collect and analyse online sentiments in real-time is one of the advantages of sentiment analysis. The user-generated content on all the social media platforms enables the interested parties to extract measurable, objective and consistent data regarding the user's emotional expressions.

Generally, all the sentiments identified represent a tweet polarity, whether a positive, negative or neutral sentiment. Ye et al. (2008) state that, through the classification of online sentiments into either positive or negative sentiment, allowed the extraction of reviews from the consumers' usage on certain product or services. Therefore, to conform to this study, the sentiments identified has been defined as "a person's positive or negative feeling." On the other hand, the expected sentiment was defined as the relationship between the sentiment and the SERVQUAL dimension. All the dimensions show a directly proportional relationship, except for 'price', which shows an inversely proportional relationship.

2.4 Transportation Service Quality Dimension (TSQD)

Transportation Service Quality Model is used to classify each tweet into different dimension of service quality. This model was proposed by Alamsyah and Rachmadiansyah (2018) by adapting the Customer Satisfaction Index (CSI) proposed by Poliakova (2010) and the SERVQUAL model proposed by Parasuraman, Zeithaml, and Berry (1985) (refer to Table 2.1). The purpose of the study conducted by Alamsyah and Rachamadiansyah (2018) is to define the problems of e-hailing companies and also to propose a problem-solving priority. The determinants or criteria proposed are availability, accessibility, information, time, customer service, comfort, safety, and environment. Criteria that are relevant to e-hailing services will then further classified into the Transportation Service Quality Dimension, based on their similar definition, and/or keywords. There is a combination of two sets elements in this study: 1) SERVQUAL dimensions, and 2) online sentiment elements, due to the focus of this study is to analyse the online sentiments of users towards e-hailing services.

The quality criteria proposed by Poliakova (2010) in research titled "Application of the Customer Satisfaction Index (CSI) to Transport Services" aimed to evaluate the passenger's satisfaction level towards transportation service quality. To use the CSI, it is necessary to understand the user's point of view towards the importance of the

dimensions. Therefore, in this study, tweets were collected to analyse the sentiments of the users during or after using the services.

SERVQUAL model is proposed by Parasuraman et al. (1985) to be used in any service industry as a guideline to serve their customer better (Cham et al., 2016; Cham, Lim & Aik, 2015; Cheng, Mansori, & Cham, 2014; Cham & Easvaralingamm, 2012). Based on Awasthi et al. (2011), ‘Tangibles’, ‘Reliability’, ‘Assurance’, ‘Empathy’, and ‘Responsiveness’ are the five dimensions in the SERVQUAL model. In the aspect of electronic service delivered through the website, a model was proposed by Parasuraman et al. (2005) to measure the electronic service quality, which includes several dimensions such as ease of use, privacy, security, efficiency and so on.

The research conducted by Parasuraman et al. (1985) on SERVQUAL has reported the insights obtained from four service business through broad exploratory research, then develop a SERVQUAL model. The focus groups conducted revealed that most of the consumers used similar criteria in evaluating the service quality, regardless of the type of services. Thus, all the criteria are then being categorized into ten different categories labelled “Determinants of Service Quality”. Another research conducted by Park, Robertson, and Wu (2006) is to investigate how these dimensions such as in-flight service, airport service, reliability, passenger satisfaction, trip availability, and pricing affect the passenger’s future intention to reuse their services.

The e-Services Quality Features and the e-CRM features proposed by Arshad, Ahmad, Janom, and Mohamed (2007) in a study was intended to explore the internet service quality in several online service industries. All the e-CRM features observed were categorized into the determinants of e-Services respectively. Another research model proposed by Septiani et al. (2017) aimed to determine the factors affecting the behaviour intention of the users on one of the online transportation services in Indonesia, which is Go-Jek. All the factors included in the research model were derived from several theories.

The service quality model proposed by Parasuraman et al. (1985) has been adopted, adapted, and amended by other researchers to fit the actual service environment. The SERVQUAL model was also used by Cham, Ng, Lim and Cheng (2018), Poliakova (2010), Alamsyah and Rachmadiansyah (2018) as a yardstick in their research. As 'price' also acts as an externality that affects the usage of services, hence, the model proposed by both Poliakova (2010) and Alamsyah and Rachmadiansyah (2018) was adapted in this study and the 'price' dimension is added into the model proposed.

After an intensive literature review, the determinants for e-hailing services in this study will be availability, accessibility, information, comfort, safety, and price.

Table 2.1: The Proposed Transportation Service Quality Model in This Study

Parasuraman et al. (1985)	Poliakova (2010)	Alamsyah & Rachmadiansyah (2018)	Dimensions Proposed in This Study
<ul style="list-style-type: none"> • Reliability • Responsiveness • Competence • Access • Courtesy • Communication • Credibility • Security • Understanding/ Knowing the Customer • Tangibles 	<ul style="list-style-type: none"> • Availability • Access • Information • Time • Customer Service • Comfort • Safety • Environment 	<ul style="list-style-type: none"> • Availability • Accessibility • Information • Time • Customer Service • Comfort • Safety • Environment 	<ul style="list-style-type: none"> • Availability • Accessibility • Information • Comfort • Safety • Price

Source: Developed for the study.

2.4.1 Availability

The description of ‘availability’ under the Transportation Service Quality Dimensions stated by Alamsyah and Rachmadiansyah (2018) is the availability of transportation service whenever, and wherever the users need it. Based on the research conducted by Poliakova (2010), the criteria stated for availability is *tickets procurement* and the availability of linkage to other transportation systems. Besides that, the measurement items on ‘availability’ stated by Park et al. (2006) which related to flights are, whether the schedule of flights are convenient to passengers, and the availability of trips that passenger requires.

The determinants of service quality such as *reliability*, *responsiveness* and *tangibles* proposed by Parasuraman et al. (1985), were being classified under the category of ‘availability’ due to the similar descriptions or definition. The descriptions for *reliability* include 1) the stability and steadiness of the service providers in performing a service right at the first time, 2) fulfilment of promises, and 3) the ability of the service providers in performing their services at the designated point of time. Furthermore, *responsiveness* includes how ready the service providers to provide a service, while *tangible* refers to the actual evidence of services provided. According to Arshad et al. (2007), one of the e-CRM features for *reliability* is the probability of the service providers to provide a customized service to different customers.

Due to the implementation of new regulation on the e-hailing industry in Malaysia after 12th July 2019, the service providers expected fewer e-hailing drivers on the road (Lai, 2019). This is because only a 10% out of two-hundred thousand drivers had obtained the public service vehicle (PSV) license. Even though before the implementation of new regulation, a negative trend can be seen by analysing the tweets. Thus, after the effects of new regulations, a higher negative polarity may be observed. With fewer drivers-partners on the road to serve the increasing demand, the average

waiting time for a ride may no longer be six minutes, especially during peak hours and rainy days, said Grab company (The Borneo Post, 2019; Tan, 2019).

2.4.2 Accessibility

‘Accessibility’ refers to the ease of use of the service at anytime, anywhere, and in any condition, which is stated by Alamsyah & Rachmadiansyah (2018). The criteria of ‘accessibility’ mentioned by Poliakova (2010) include both *geographical* and *time accessibility*. Moreover, *perceived usefulness* and *perceived ease of use* mentioned by Septiani et al. (2017) were also classified under the category of ‘accessibility’ due to the common keywords ‘ease of use’ and ‘usefulness’ in their description. Davis (1989) define ‘accessibility’ as how the users perceived that technology will improve the performances of the service. While *perceived ease of use* can be defined as how the users believe that only little efforts are required in using the services (Septiani et al., 2017).

The e-CRM features mentioned by Arshad et al. (2007) for *ease of use* include the easiness for users to check out after the service, and the rapidness to initiate an order. The descriptions for ‘accessibility’ proposed by Parasuraman et al. (1985) include the usability and the easiness to contact, which means the likeness that the service can be access through the mobile application and whether the services are handy to use at any point of time.

2.4.3 Information

Based on the description in the Transportation Service Quality Dimensions (Alamsyah & Rachmadiansyah, 2018), ‘information’ refers to users are well-informed with all travel information such as travel fares, waiting time, pickup location, driver’s name, and the traffic condition at real-time. The

criteria required (Poliakova, 2010) include the availability of transport at any hour, stops signage, and travel fares. Arshad et al. (2007) state that users account on the mobile application and online service information are e-CRM features that mainly related to transportation service quality as there is a proportionate relationship between information and user's confidence. The higher the availability of information leads to greater transparency of the information. Thus, increases in user's confidence. *Communication* which falls under the determinants of SERVQUAL proposed by Parasuraman et al. (1985) is categorized under the dimension of 'information' due to the similar definition of 'keeping the customer informed'. *Communication* refers to ensuring the users are well-informed to the information with the appropriate language for different customers, as this may reduce the uncertainty associated with the users when using the services. To keep customer informed may include where users are fully understanding the service, users know how much it cost, and ensure all discontent faced by the users will be handled.

2.4.4 Comfort

'Comfort' is defined as how well the company do to ensure the users are comfortable when using the services, such as the cleanliness of the vehicle, driving style, and weather protection by Alamsyah and Rachmadiansyah (2018). According to Poliakova (2010), the partial criteria mentioned in the study include protecting the users against any weather, driver's driving style, and the cleanliness of the vehicle used. Furthermore, *courtesy* and *understanding/knowing the customer* are the determinants of SERVQUAL model proposed by Parasuraman et al. (1985) were also categorized under the 'comfort' dimension due to the similarity in definition such as being considerate to the users. According to Parasuraman et al. (1985), *courtesy* refers to how users are being treated by the service providers, while *understanding/knowing the customers* involves how service providers will

do their best to fulfil customer's requirements, and providing additional attention to those individuals in need.

In research conducted by Park et al. (2006), *airport service* and *passenger satisfaction* are classified under the dimension of 'comfort' due to the similar measurement items. The measurement items of *airport service* include waiting time and efficiency of the services, promptitude and the preciseness in baggage delivery, and seats allocation, while the measurement items of *passenger satisfaction* include whether the users are satisfied with the services provided and whether the users think that their choice of using the services is a wise choice.

Since Uber quitted the Southeast Asia markets, the e-hailing services are mainly dominated by Grab. The Star Online (2018) states that the number of complaints lodged against Grab services has increased dramatically, especially the unsatisfactory services offered.

2.4.5 Safety

Alamsyah and Rachmadiansyah (2018) defined 'safety' as the company effort to ensure the users are safe when using the services, such as driver preparation, driver's knowledge towards the route, and driver's awareness towards traffic condition. Poliakova (2010) includes the driver's driving style, lighting of the vehicle, and the management of driver as criteria for evaluating the quality of services in e-hailing transportation. Besides that, *trust* was also categorized under the dimension of safety, where Septiani et al. (2017) defined *trust* as to how users believe that the service providers will protect them from privacy threats. The e-CRM features of *security* included in the dimension of 'safety' are the user privacy policy, membership, and data protection in users' account. (Arshad et al., 2007).

Furthermore, according to Parasuraman et al. (1985), the determinants included in the dimension of ‘safety’ are *credibility* and *security*. *Credibility* refers to putting the user’s best interest in the first place, and items that contributed to *credibility* include company name and reputations, and the characteristics of the contact personnel. *Security* is defined as that users are free from any danger, risk or doubt, and it includes ensuring the individuals are safe physically, financially secured, and the individual’s data are confidential. Moreover, *reliability* mentioned by Park et al. (2006) is categorized under the dimension of ‘safety’ due to the common keyword of ‘safety’ mentioned. The measurement items included are whether the service providers are sincere in solving the problems faced by the users and ensuring the safety of the service used.

To protect the safety of both driver and passengers, Grab has made it compulsory for every user to submit a selfie to use the e-hailing services (Chu, 2019). As technology advances, selfie submitted by the users is used as a verification purpose, which is part of the recognition technology. However, for the privacy concern, according to Chu (2019), the companies will have to comply with the Personal Data Protection, said Azlan Shah, the director-general of the Land Public Transport Agency’s (APAD).

Ellis (2019) reported that in Indonesia, one-third of e-hailing made through the Go-Jek’s application may be a fraud, while approximate 5% of Grab orders could also be fake. Fake orders had harmed the performance metrics of e-hailing services in the country. Therefore, by increasing the safety of the service provided, it eventually shows a positive sentiment by the users.

2.4.6 Price

The measurement items of 'price' include comparing whether the price paid for the service is worth what the service offered. (Park et al., 2006). Price also refers to the willingness of consumers to forgo their income to exchange for a service. Wu, Zhang, Tian, Wang, & Hua (2018) mentioned that users' demand, vehicle supply, locations, traffic flow and time are the factors that affect the price. Therefore, different rates can be charged based on the factors mentioned.

In Malaysia, after the implementation of new e-hailing regulation, all the cabbies are required to have a public service vehicle (PSV) license to drive taxis, and the e-hailing vehicle permit (EVP) must be required by all the e-hailing drivers (Palansamy, 2019; Lai, 2019). Therefore, users of e-hailing service may anticipate higher fares after the implementation of the new regulation. As the number of e-hailing drivers decreases due to many of the drivers yet to hold an EVP, MeHDA has foreseen a surge in fares (The Star Online, 2019). Surcharge may even apply when the supply and demand issues occur. Therefore, following the increase in price in using the e-hailing services, negative sentiments will be identified.

Table 2.2: Proposed Online Sentiment Analysis based on Transportation Service Quality Model

Service Quality Dimensions	Descriptions	Sources	Expected Sentiment
Availability	The availability of transportation service whenever, and wherever the users need it.	Alamsyah and Rachmadiansyah (2018) Poliakova (2010) Parasuraman et al. (1985) Arshad et al. (2007)	+ve
Accessibility	The ease of use of the service at anytime, anywhere, and in any conditions.	Alamsyah and Rachmadiansyah (2018) Poliakova (2010) Parasuraman et al. (1985) Septiani et al. (2017) Arshad et al. (2007)	+ve
Information	Users are well-informed with all travel information such as travel fares, waiting time, pickup location, driver's name, and real time traffic condition. The increase in information availability, leads to greater confidence of users in using the services.	Alamsyah and Rachmadiansyah (2018) Poliakova (2010) Parasuraman et al. (1985) Arshad et al. (2007)	+ve

Comfort	The company effort to ensure that the users are comfortable when using the services.	Alamsyah and Rachmadiansyah (2018) Poliakova (2010)	+ve
	Provide additional services to enhance the experience of the users in using the services.	Parasuraman et al. (1985) Park et al. (2006)	
Safety	The company effort to ensure that users are safe when using the services.	Alamsyah and Rachmadiansyah (2018)	+ve
		Poliakova (2010)	
		Parasuraman et al. (1985)	
		Septiani et al. (2017)	
		Arshad et al. (2007)	
Price	The price consumers agreed to pay in order to use the service.	Park et al. (2006)	-ve
		Wu et al. (2018)	

Source: Developed for the study.

2.5 Previous Studies on Online Sentiment

A similar study conducted by Alamsyah and Rachmadiansyah (2018) on analysing e-hailing service quality shows that both Grab and Go-Jek have an extremely high negative tweet sentiment, 1328 (90.83%) out of 1462 tweets. Under the dimension proportion of Go-Jek, 'accessibility' (34.70%) and 'availability' (24.1%) are among the highest negative sentiment compared to other service dimensions. On the other hand, under the dimension proportion of Grab, 'accessibility' (23.00%) is also the highest while 'information' (18.40%) holds the second-highest negative sentiments among other dimensions.

Besides that, the results of a study conducted by Anastasia and Budi (2016) on analysing the Twitter sentiment of e-hailing service providers shows that Grab has better Net Sentiment Score (NSS) than Go-Jek as Go-Jek has negative NSS which represent low customer satisfaction.

Windasari et al. (2017) in their study analyze the sentiments of Go-Jek on Twitter posts. Every tweet, including positive or negative, was classified using machine learning (SVM). All the emoticon was converted beforehand to avoid being deleted. The test resulted in an 86% accuracy and 14% of prediction error.

Silalahi et al. (2017) conducted a study on analyzing the service quality of e-hailing services, mainly focused on Go-Jek. The result of the analysis shows that in service quality, 'perceived cognitive' is the highest-weighted criterion; in information quality, 'content usefulness' has the highest-weighted criterion, followed by 'ease of use' in system quality dimension.

CHAPTER 3: METHODOLOGY

3.0 Introduction

In this research, the problem statement was first to be defined then followed by setting the research objective and ended with a conclusion. In the data collection process, Twitter is the only social media used to collect all the data and the reason for deciding to use Twitter was explained in 1.0 Introduction part. The focus of this study is to analyse the trends of online sentiments which represent the user's satisfaction regarding the e-hailing services provided in both Malaysia and Indonesia. This study uses a descriptive approach and the data collection was conducted by collecting all the relevant tweets manually on Twitter.

3.1 Data Collection

All data in this study was obtained from Twitter, and data was taken from any tweets related to Grab and Go-Jek. There are two major sources of data, one from Go-Jek's official Twitter account (@gojekindonesia), and the other from Grab's official Twitter account (@grabMY). 8 months of data were collected from 1st January to 22nd September 2019. Besides the official accounts, keywords such as "@gojekindonesia", "Gojek", "go-jek", "@grabMY", and "grab" were used as filters to choose all the relevant tweets from various users. All the tweets collected were print screened then classified into six different dimensions by referring to TSQM, which was adapted by Alamsyah and Rachmadiansyah (2018) from Customer Satisfaction Index proposed by Poliakova (2010).

TSQM was used as a guideline to categorize the tweets collected. The dimensions used in this study consists of six dimensions which are 'availability', 'accessibility', 'information', 'comfort', 'safety', and 'price' (refer to Table 3.2).

All the measuring dimensions were developed through a broad literature review and the dimensions were listed in Appendix 3.3. All the tweets, regardless of positive or negative, were categorized according to the model mentioned above, and the tweets were categorized manually according to the closest meaning or keywords that the tweets intend to express. A total of 353 tweets was collected for Go-Jek Indonesia, and 335 for Grab Malaysia.

All the tweets regardless of languages were captured and categorized according to TSQM. Some of the tweets with Bahasa Indonesian were further Google translate into English to understand the intended meaning that the writers wish to convey. Some tweets are in text-based but there are plenty of tweets with pictures or images. This allows the interested parties to further understand the actual idea or situations of the incidents. Besides that, some tweets consist of emoticons, which is also a way to allow the writer to convey their expression towards their services experience. Due to privacy concern, only public tweets can be collected. Those users who commented under a 'Thread' that keyword was mentioned were also collected, if they are commented by different users and different issues were discussed.

On May 2019, tweets from 1st January to 30th April 2019 were traced back, and from May 2019 onwards, all the tweets were checked twice a week until 22nd September 2019. This is because some sensitive tweets may be deleted by the writer or the person in charge of the respective official e-hailing Twitter accounts. Tweets will be checked trice a week if there are public holidays or any enforcement of new regulations. Thus, the trends of online sentiments can be analysed more accurately.

Besides that, the trends of online sentiments during the period such as festive seasons, long-weekend holidays and implementation of new regulations (refer to Figure 3.1) will be further analysed. This is because the usage of e-hailing services during these periods may vary, hence potentially affecting the general trends. However, in this study, only positive and negative sentiments were captured and analysed.

Figure 3.1: Examples of Implementation of New Rules by Grab Malaysia



Source: The Star Online (2019)

3.2 Data Classification

There are two stages of analysis. First, all the tweets captured were classified into two sentiments: positive or negative. The polarity of the tweets, positive or negative, were determined manually according to the emoticons, pictures or image, and the words used in tweets to express their feelings. This is because software such as Support Vector Machine, may not be able to identify the true meaning of those sarcastic tweets even with positive emojis (refer to Figure 3.2 & 3.3). Some elements may not be able to analyze accurately by software means (Findley, Cunningham, & Hummer, 2011). However, for simplicity, only positive and negative sentiments were captured, but for neutral sentiment, will be rechecked to identify whether it is a positive or negative sentiment. Certain vulgar wordings or

tweets with reverse meaning can also be an indicator of whether the tweets are express in positive or negative sentiment.

Figure 3.2: Example of Negative Tweets with Positive Emojis (Reverse Meaning)



Source: Leong (2019)

Figure 3.3: Example of Tweet with Reverse Meaning



Source: Maheshwari (2019)

After all tweets captured were classified as positive or negative sentiments, the tweets were then categorized into the six dimensions respectively from TSQM which are: 1) Availability, 2) Accessibility, 3) Information, 4) Comfort, 5) Safety, and 6) Price. The tweets were categorized based on similar meaning or if the content of the tweets is related to the features of the dimensions.

Table 3.1: Example of Tweet Classification by Sentiment

Sentiment	Example Tweets	Sentiment
Positive	<i>So easy to get taxis with this @GrabMY app! Plus, drivers are very nice and helpful! #apps #grab #taxis #goodservice #malaysia</i>	+ve
Negative	<i>YOUR DRIVER IS TEXTING IN THE CAR WHILE DRIVING SO SLOW AT THE SPEED OF A SNAIL!</i>	-ve

Source: Developed for the study.

Table 3.2: Example of Tweet Classification based on Transportation Service Quality Dimension

Dimension	Example Tweets	Sentiment
Availability	<i>Salam @GrabMY you suck! Been waiting for 30 minutes. fxxk off!</i>	-ve
Accessibility	<i>If you want people to still be loyal to @gojekindonesia you better fix the app asap because people can't commute to places everytime the app encounter problem</i>	-ve
Information	<i>Super impressed with @GrabMY. The app translated my messages and made the pickup easy!!</i>	+ve
Comfort	<i>@gojekindonesia <3 <3 <3 thank you for providing some great drivers <3</i>	+ve
Safety	<i>Taking @GrabMY to KLIA and driver decides to drive without using predesignated route and stuck in traffic for more than 20mins. #Grab</i>	-ve
Price	<i>What the FxxK is your pricing system based on @GrabMY, how can a ride be 18 ringgit at 8:18am then be kicked up to //27// ringgit at 8:20am??? And you don't have enough drivers to support demand?? Good GOD can we just agree that Grab MY is nowhere as efficient as SG</i>	-ve

Source: Developed for the study.

Table 3.3: List of Parameters/Determinants and Keywords/Definition/Description for Each Dimension

Dimensions	Parameter/Determinants	Keywords/Definition/Description/Measurement Items	Sources
Availability	Availability	Availability of transportation service in anytime, anywhere, and in any condition	Alamsyah and Rachmadiansyah (2018)
	Availability	Tickets procurement Available linkage to other transportation systems	Poliakova (2010)
	Available of trips	Convenient trip schedule Availability of service required	Park et al. (2006)
	Reliability	Perform service at the designated time	Parasuraman et al. (1985)
	Responsiveness	Readiness to provide service	
	Tangibles	Actual evidence of the service	
	Reliability	Probability to provide customize service	Arshad et al. (2007)
Accessibility	Accessibility	Ease of use of the service at anytime, anywhere, and in any condition	Alamsyah and Rachmadiansyah (2018)
	Access	Geographic and time accessibility Frequency of service	Poliakova (2010)
	Perceived ease of use	Ease of operating hailing process	Septiani et al. (2017)
	Perceived usefulness	Usefulness	
	Ease of use	Easiness for user to check out Rapidness to initiate orders	Arshad et al. (2007)
	Access	Approachability and ease of contact	Parasuraman et al. (1985)

Information	Information	Available of information	Alamsyah and Rachmadiansyah (2018)
	Information	Available of service	Poliakova (2010)
		Stop signage	
		Travel fares	
	Information	Online service information	Arshad et al. (2007)
	Account information		
	Communication	Keep customers informed	Parasuraman et al. (1985)
Comfort	Comfort	How company ensure that users are comfortable using the service	Alamsyah and Rachmadiansyah (2018)
	Comfort	Protection against weather	Poliakova (2010)
		Vehicle cleanliness	
		Driving style	
	Courtesy	Include politeness, consideration, and friendliness	Parasuraman et al. (1985)
	Understanding/Knowing the customer	Make effort to understand the customer's needs	
	Airport service	Waiting time and efficiency	Park et al. (2006)
Passenger satisfaction	How users are satisfied with the service quality?		

	Safety	Company effort to provide safety and security to users	Alamsyah and Rachmadiansyah (2018)
Safety	Safety	Driving style	Poliakova (2010)
		Lighting of the vehicle	
		Management of the drivers	
	Trust	Users believe the company will protect them from safety threats	Septiani et al. (2017)
	Security	Privacy policy	Arshad et al. (2007)
		Protection of user's account	
Credibility	Putting user's best interest first	Parasuraman et al. (1985)	
Security	Users are free from danger, risk, or any doubt		
Reliability	Safety of flying	Park et al. (2006)	
	Sincere in solving user's problems		
Price	Pricing (value)	Is the service worth what user paid?	Park et al. (2006)

Source: Developed for the study.

3.3 Data Analysis Tool

Statistical Package for the Social Science (SPSS) was used to run all the data collected and to obtain results such as frequencies for total sentiments, sentiments for both Malaysia and Indonesia, and descriptive of tweets with 2 or more dimensions. Besides, it is also used to obtain the possible combination for 6 dimensions, which resulted in 15 different combinations. This is because there are tweets with multiple sentiments on various dimensions. Moreover, SPSS was used to analyze the sentiments in Malaysia from January to June 2019, and July to September 2019. The tweets collected are separated into 2 sections is due to there is an implementation of new regulation, the Private Service Vehicle (PSV) license in July 2019. Because this study would like to study the effects on sentiments before and after the implementation of new regulation. Thus, SPSS allows to study whether there are any changes in the online sentiments.

CHAPTER 4: DATA ANALYSIS

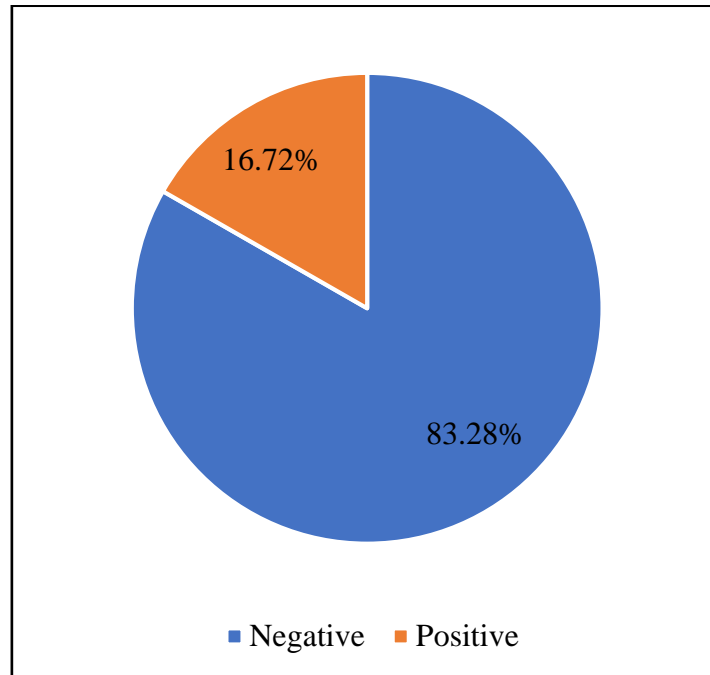
4.0 Introduction

In this chapter, 688 tweets collected were analyzed via SPSS, and all the results obtained will be used to answer the research question. The first part of this chapter explains frequencies of the overall sentiments, tweets collected for Grab Malaysia and Go-Jek Indonesia, the combination for 6 dimensions, and the sentiments before and after the implementation of new e-hailing regulation in Malaysia.

4.1 General Online Sentiments on E-hailing Services

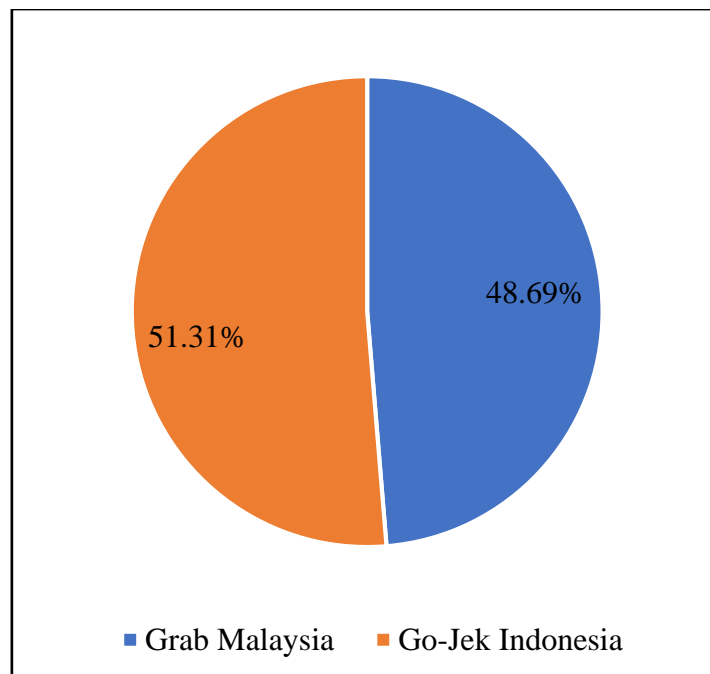
A total of 688 tweets were collected, where 573 (83.28%) are negative and 115 (17.72%) are positive sentiments (refer to Figure 4.1). Out of 688 tweets collected via Twitter and keywords, 335 (48.69%) tweets were collected for Grab Malaysia, where 293 (87.46%) tweets are negative, and the remaining 42 (12.54%) are positive (refer to Figure 4.2 & 4.3). On the other hand, 353 (51.31%) tweets for Go-Jek Indonesia, which consists of 280 (79.32%) negative tweets and 73 (20.67%) positive tweets (refer to Figure 4.2 & 4.4). Moreover, 143 (20.78%) out of 688 tweets consists of 2 or more dimensions per tweet. 120 (83.92%) out of 143 tweets commented are negative, while 23 (16.08%) tweets are positive (refer to Figure 4.5).

Figure 4.1: Percentage of Total Tweets Collected



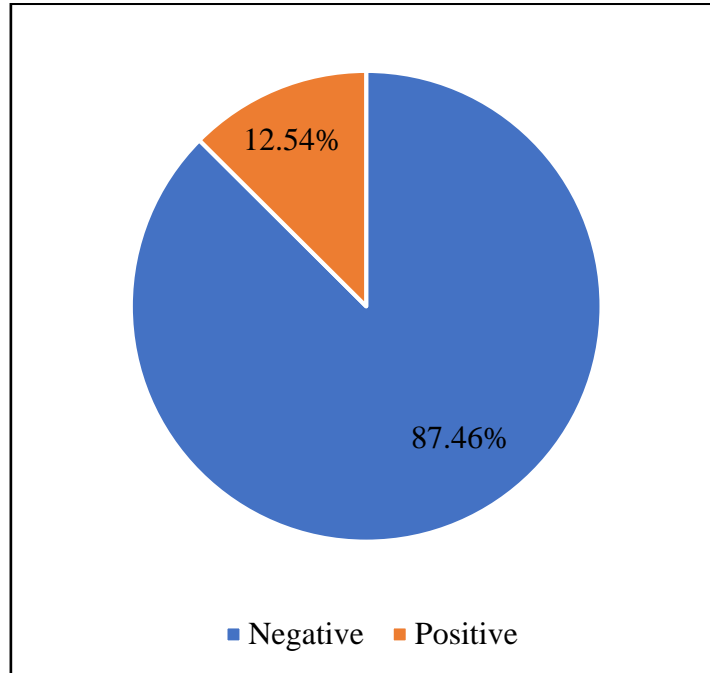
Source: Developed for the study.

Figure 4.2: Percentage of Tweets for Grab Malaysia and Go-Jek Indonesia



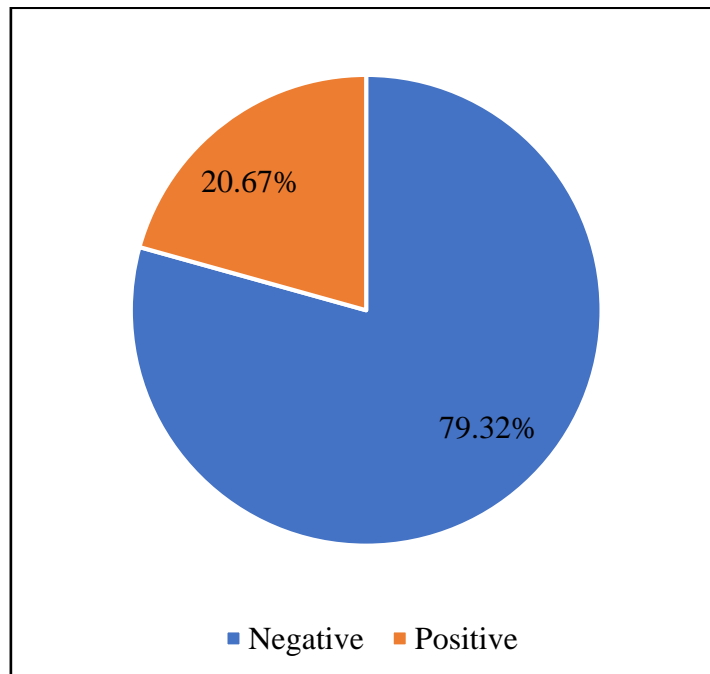
Source: Developed for the study.

Figure 4.3: Percentage of Negative and Positive Tweets for Grab Malaysia



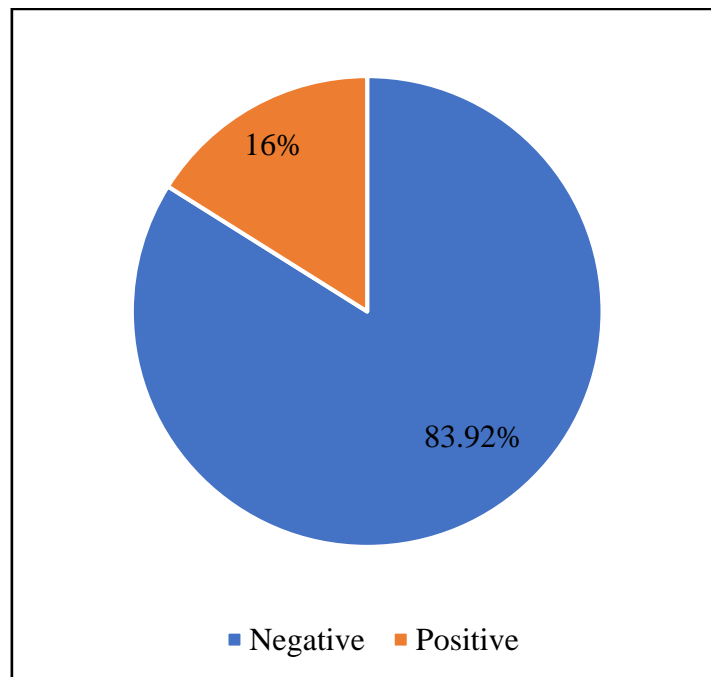
Source: Developed for the study.

Figure 4.4: Percentage of Negative and Positive Tweets for Go-Jek Indonesia



Source: Developed for the study.

Figure 4.5: Percentage of Negative and Positive Tweets with 2 or More Dimensions

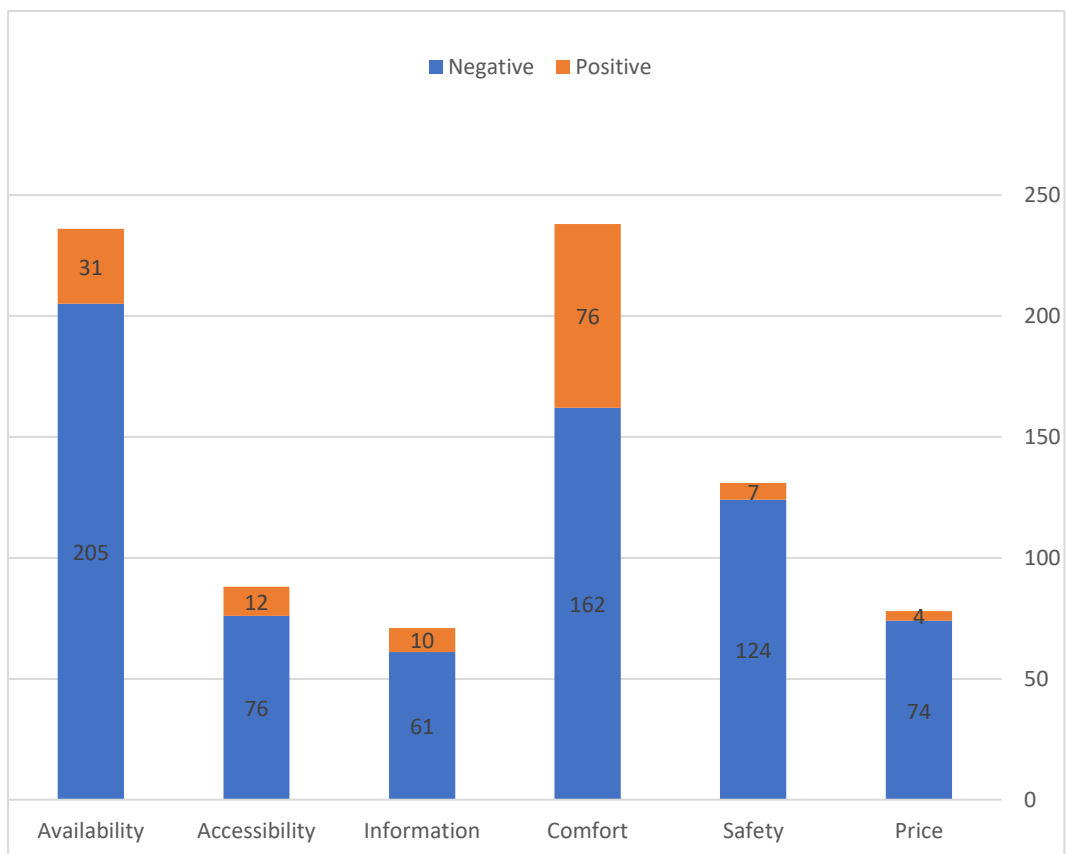


Source: Developed for the study.

4.2 Online Sentiments for 6 Dimensions

Out of 688 tweets collected, 842 sentiments were identified because there are tweets with multiple sentiments on various dimensions. 140 (16.63%) out of 842 sentiments are positive, while 702 (83.37%) sentiments are negative. In overall, by referring to Table 4.2, ‘comfort’ (238, 28.27%) has the highest number of sentiments, followed by ‘availability’ (236, 28.03%) and ‘safety’ (131, 15.56%). On the other hand, ‘information’ (71, 8.43%) has the lowest number of sentiments followed by ‘price’ (78, 9.26%) then ‘accessibility’ (88, 10.45%). The results were shown at Table 2.2.

Figure 4.6: Total Sentiments of Each Dimension for Both Malaysia and Indonesia



Source: Developed for the study.

4.3 Online Sentiments for Countries

4.3.1 Malaysia

There are 440 sentiments (335 tweets) identified on Malaysia's sample of tweets, where 55 (12.50%) are positive, and another 385 (87.5%) are negative sentiments. Out of the 6 dimensions, 'comfort' (129, 29.32%) has the highest sentiments, followed by 'availability' (121, 27.50%), then 'price' (62, 14.09%). On the contrary, 'information' (33, 7.50%) has the lowest sentiments, 'accessibility' (40, 9.90%) then followed by 'safety' (55, 12.50%).

4.3.2 Indonesia

402 sentiments (353 tweets) were identified on Indonesia's sample of tweets, where 85 (21.14%) are positive, and 317 (78.86%) are negative sentiments. 'Availability' (115, 28.61%) has the highest sentiments followed by 'comfort' (109, 27.11%) and 'safety' (76, 18.91%); while 'price' (16, 3.98%) has the lowest sentiments among the 6 dimensions, followed by 'information' (38, 9.45%), then 'accessibility' (48, 11.94%).

4.4 Malaysia vs Indonesia

'Comfort', 'availability', and 'price' were ranked the top 3 important dimensions that riders concerned the most in Malaysia; while 'availability', 'comfort', and 'safety' were ranked top 3 in Indonesia, based on calculating the Relative Importance Index (RII). The ranking for the first and second dimensions in both Malaysia and Indonesia are more or less the same, however, 'price' was ranked third in Malaysia but sixth in Indonesia.

Table 4.1: Summary of Online Sentiment from Twitter for Grab Malaysia and Go-Jek Indonesia

Dimensions	Countries	Positive		Negative		Total		Relative Importance Index (RII)	Relative Ranking	Ratio (Positive/Negative)	Expected Sentiment	Sentiment*
		Sentiment (s)		Sentiment (s)								
		N	%	N	%	N	%					
Availability	Malaysia	7	5.00	114	16.24	121	21.24	0.1437	2	0.0614	+ve	-ve
	Indonesia	24	17.14	91	12.96	115	30.10	0.1366	1	0.2637		
Accessibility	Malaysia	6	4.29	34	4.84	40	9.13	0.0475	5	0.1765	+ve	-ve
	Indonesia	6	4.29	42	5.98	48	10.27	0.0570	4	0.1429		
Information	Malaysia	6	4.29	27	3.85	33	8.14	0.0392	6	0.2222	+ve	-ve
	Indonesia	4	2.86	34	4.84	38	7.70	0.0451	5	0.1176		
Comfort	Malaysia	30	21.43	99	14.10	129	35.53	0.1532	1	0.3030	+ve	-ve
	Indonesia	46	32.86	63	8.97	109	41.83	0.1295	2	0.7302		
Safety	Malaysia	3	2.14	52	7.41	55	9.55	0.0653	4	0.0577	+ve	-ve
	Indonesia	4	2.86	72	10.26	76	13.12	0.0903	3	0.0556		
Price	Malaysia	3	2.14	59	8.40	62	10.54	0.0736	3	0.0509	-ve	-ve
	Indonesia	1	0.7143	15	2.14	16	2.85	0.0190	6	0.0667		
Total		140	100.00	702	100.00	842	200.00	1.0000				

Source: Developed for the study.

Note: *Positive if % of positive tweets > negative tweets, and vice versa.

4.5 Tweet with 2 or More Dimensions

The total number of both positive and negative sentiments for the 6 dimensions will be different from the total number of tweets collected (688 tweets). This is because some tweets are with multiple sentiments on various dimensions. The positive and negative sentiments for each dimension, expected sentiments, actual sentiments, and the relative importance for each dimension were tabulated and ranked accordingly based on RII calculated in Table 4.1, while all combinations of the 6 dimensions were tabulated in Table 4.2.

4.5.1 Availability vs Accessibility

Out of 120 negative tweets, 9 (7.5%) tweets commented on both availability and accessibility at the same time. The combination of availability and accessibility, with information (11.11%) and price (11.11%) were also commented at the same time in 1 of the 9 tweets respectively.

4.5.2 Availability vs Information

10 out of 143 tweets, 8 (80.00%) are negative tweets and the remaining 2 (20.00%) are positive. However, 6 (60.00%) tweets commented both availability and information at the same time, and the remaining 4 are the combination of both availability and information, with accessibility (10.00%), comfort (10.00%), safety (10.00%), and price (10.00%) respectively.

4.5.3 Availability vs Comfort

Out of 143 tweets, 42 tweets commented both availability and comfort in the same tweet. 32 (76.19%) out of 42 tweets are negative, and the remaining 10 (23.81%) are positive tweets. Out of 42 tweets, there is 1 (2.38%) tweet commented availability, comfort and information at the same time; 2 (4.76%) commented availability, comfort, and safety, and 2 (4.76%) commented availability, comfort, and price. The remaining 37 tweets only commented both availability and comfort.

4.5.4 Availability vs Safety

8 out of 120 negative tweets, 1 (12.50%) tweet commented availability, safety, and information at the same time; 2 (25.00%) commented availability, safety, and comfort under 1 tweet, while the remaining 5 (62.50%) only commented both availability and safety in their tweets.

4.5.5 Availability vs Price

19 out of 143 tweets, there is 1 (5.26%) positive and 18 (94.74%) negative tweets where both availability and price were commented. Out of those 19 tweets, 1 (5.26%) commented both availability and price, with accessibility, another 1 (5.26%) commented with information; and 2 (10.53%) commented with comfort. The remaining 15 (78.95%) tweets only commented both availability and price.

4.5.6 Accessibility vs Information

4 (2.80%) out of 143 tweets commented both accessibility and information at the same time, 3 (75.00%) negative and the remaining 1 (25.00%) is a positive tweet. 2 (50.00%) tweets only commented both accessibility and information, while 1 (25.00%) commented both accessibility and information, with availability, and another 1 (25.00%) commented with comfort.

4.5.7 Accessibility vs Comfort

12 (8.39%) out of 143 tweets commented both accessibility and comfort at the same time, where 8 (66.67%) tweets are negative, and the remaining 4 (33.33%) are positive. The combination of accessibility, comfort, and information was mentioned once (8.33%); while the remaining 11 (91.67%) tweets only commented both accessibility and comfort.

4.5.8 Accessibility vs Safety

There is only 1 (50.00%) positive and 1 (50.00%) negative tweet that commented both accessibility and safety at the same time.

4.5.9 Accessibility vs Price

2 out of 143 tweets which have 2 or more dimensions mentioned, there is 1 (50.00%) positive and 1 (50.00%) negative tweet. 1 only commented both accessibility and price, while another commented on the combination of accessibility, price, and availability in the tweet.

4.5.10 Information vs Comfort

A total of 15 (10.49%) out of 143 tweets commented both information and comfort. 2 (13.33%) out of 15 tweets are positive, and the remaining 13 (86.67%) are negative. However, the combination of information and comfort, with availability was mentioned once (6.67%) out of the 15 tweets, and another (6.67%) was commented on the combination of information, comfort, and accessibility.

4.5.11 Information vs Safety

6 out of 120 negative tweets, 1 (16.67%) commented on the combination of information and safety, with availability, and 3 (50.00%) commented with comfort, and the remaining 3 (50.00%) only commented both information and safety at the same time.

4.5.12 Information vs Price

There is only 1 (0.8333%) negative tweet commented on both information and price at the same time, but with the additional dimension of availability.

4.5.13 Comfort vs Safety

33 (23.08%) out of 143 tweets commented both comfort and safety at the same time. Out of 33 tweets, 29 (87.88%) are negative and the remaining 4 (12.12%) are positive tweets. There are 2 out of 33 tweets commented on the combination of comfort, safety, and availability; 3 commented both comfort and safety, with an additional dimension of information. The remaining 28 only commented both comfort and safety at the same time.

4.5.14 Comfort vs Price

2 out of 143 tweets with 2 or more dimension commented, there is 1 positive and 1 negative tweet, where 1 (50.00%) only commented both comfort and price; while the combination of comfort, price, and availability was commented in another tweet (50.00%).

4.5.15 Safety vs Price

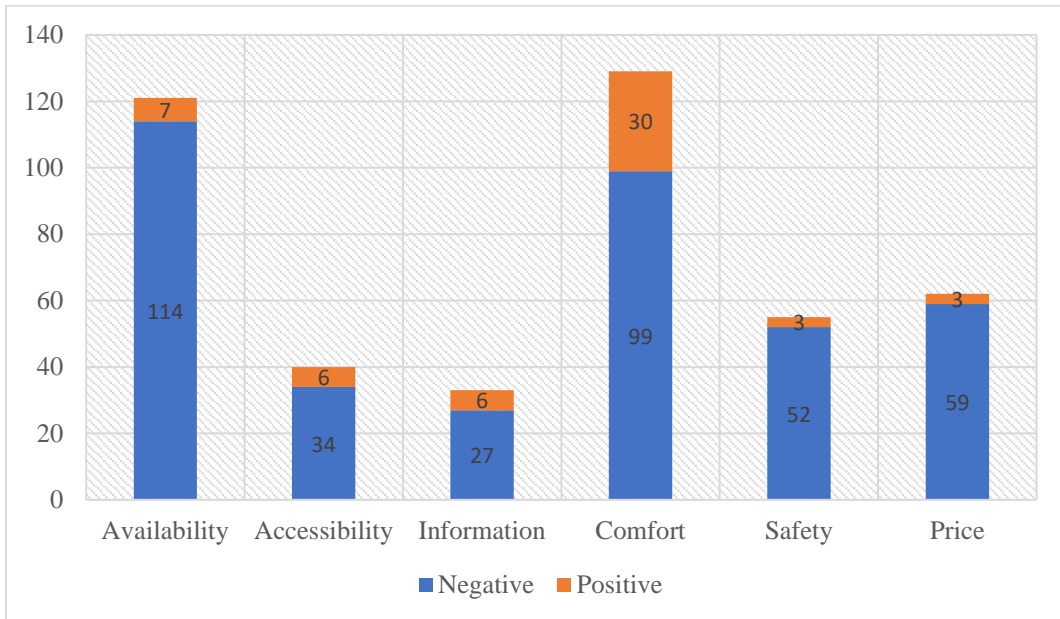
The combination of safety and price was only commented once (0.8333%) out of 120 negative tweets.

Table 4.2: Frequencies for the Combination of 2 or More Dimensions

	Availability		Accessibility		Information		Comfort		Safety		Price	
	+ve	-ve	+ve	-ve	+ve	-ve	+ve	-ve	+ve	-ve	+ve	-ve
Availability			0	9	2	8	10	32	0	8	1	18
Accessibility					1	3	4	8	1	1	1	1
Information							2	13	0	6	0	1
Comfort									4	29	1	1
Safety											0	1
Price												
Total			0	9	3	11	16	53	5	44	3	22

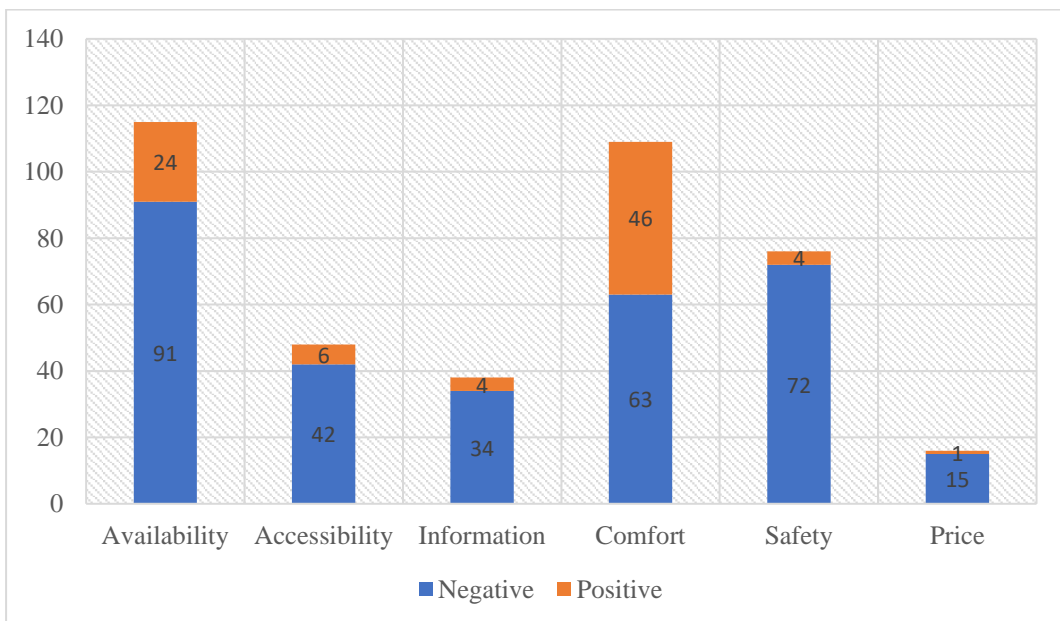
Source: Developed for the study.

Figure 4.7: Online Sentiments of Each Dimension for Grab Malaysia



Source: Developed for the study.

Figure 4.8: Online Sentiments of Each Dimensions for Go-Jek Indonesia



Source: Developed for the study.

4.6 Sentiments Before and After the Implementation of New E-hailing Regulation in Malaysia

In order to understand the influence of new regulation on online sentiments, the total tweets collected for Grab Malaysia were separated into 2 sections: January to June, and July to September (refer to Table 4.3). This is because this study would like to analyze whether there will be a strike on negative sentiments after implementation of new e-hailing regulations on 12th July 2019. As mentioned in 1.1 Research Background, due to the decrease in the number of drivers available in the market, there may be an increase in prices and longer waiting time, thus leads to higher negative sentiments.

4.6.1 Overall Sentiments (January to June)

There is a total of 240 tweets collected which falls under January to June 2019 for Malaysia's sample (refer to Figure 4.9). Out of 240 tweets, 28 tweets are positive, and the remaining 212 are negative. 85 tweets commented on the dimension availability, 28 commented on accessibility, 21 commented information, 97 commented comfort, 44 commented safety, and the 41 tweets commented on price. However, the total number of tweets commented on each dimension will be different from the total number of tweets collected. This is because some tweets commented on 2 or more dimension at one time.

4.6.2 Negative Sentiments (January to June)

Based on all the negative tweets collected, 83 tweets commented availability, 24 commented accessibility, 18 commented information, 74 commented comfort, 42 commented safety, and 40 commented on price.

4.6.3 Positive Sentiments (January to June)

Based on all the positive tweets collected, 2 commented on availability, 4 commented on accessibility, 3 commented on information, 23 commented on comfort, 2 commented on safety, and 1 commented on price.

4.6.4 Overall Sentiments (July to September)

The total number of tweets collected from July to September 2019 for Malaysia context is 95. Out of 95 tweets, 14 tweets are positive, and 81 are negative. However, the total number of dimensions commented will not be equal to the number of tweets collected, as some users commented on 2 or more dimensions in one tweet.

4.6.5 Negative Sentiments (July to September)

Based on all the negative tweets collected, 31 commented availability, 10 commented accessibility, 9 commented information, 25 commented comfort, 10 commented safety, and 19 commented on price.

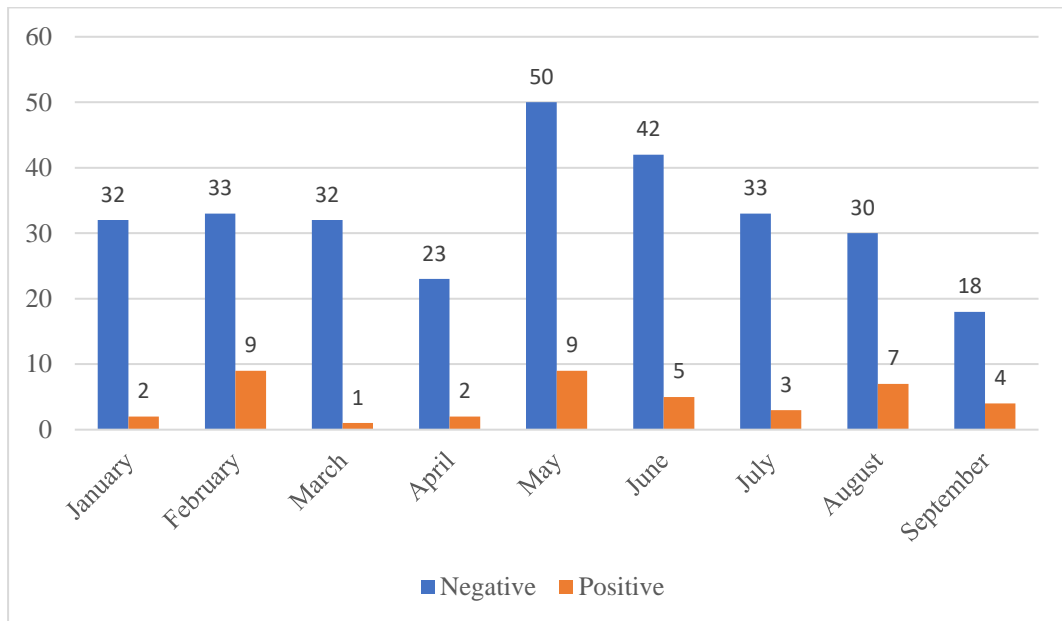
4.6.6 Positive Sentiments (July to September)

Based on all the positive tweets collected, 5 commented availability in their tweets, 2 commented accessibility, 3 commented information, 7 commented comfort, 1 commented safety, and 2 commented on price.

Table 4.3: Summary of Online Sentiments for Malaysia's Sample

Dimensions	Month (s)	Positive		Negative		Total		Ratio (Positive/ Negative)
		Sentiment (s)		Sentiment (s)				
		N	%	N	%	N	%	
Availability	January to June	2	3.64	83	21.56	85	19.32	0.0241
	July to September	5	9.09	31	8.05	36	8.18	0.1613
Accessibility	January to June	4	7.27	24	6.23	28	6.36	0.1667
	July to September	2	3.64	10	2.60	12	2.73	0.2000
Information	January to June	3	5.45	18	4.68	21	4.77	0.1667
	July to September	3	5.45	9	2.34	12	2.73	0.3333
Comfort	January to June	23	41.82	74	19.22	97	22.05	0.3108
	July to September	7	12.73	25	6.49	32	7.27	0.2800
Safety	January to June	2	3.64	42	10.91	44	10.00	0.0476
	July to September	1	1.82	10	2.60	11	2.50	0.1000
Price	January to June	1	1.82	40	10.39	41	9.32	0.0250
	July to September	2	3.64	19	4.94	21	4.77	0.1053
Total		55	100.00	385	100.00	440	100.00	

Source: Developed for the study.

Figure 4.9: Total Tweets Collected for Grab Malaysia

Source: Developed for the study.

CHAPTER 5: DISCUSSION, CONCLUSION AND IMPLICATION

5.1 Discussions on Major Findings

Based on the analysis on the combination of 2 or more dimensions, out of 15 combinations, the combination of availability and comfort shows the highest negative (32 sentiments) and positive (10 sentiments) sentiment. When the service is available at anytime and anywhere when the customer needs it, customer feels comfortable in terms of the availability and ease of use of the e-hailing service. A research conducted by Poliakova (2010) proves that the greater the comfort provided to the customers, the higher the customer satisfaction index.

The combination of 'comfort' and 'safety' shows the second highest (29 sentiments) in terms of negative sentiment. Cases where the e-hailing made through the Go-Jek application are fraud was reported by Ellis (2019). Most of the riders' complaint that the drivers have completed their service without picking them from the designated location. This leads riders to feel uncomfortable and unsafe when the fares were being deducted from their account, but the service was not fulfilled.

The third highest (18 sentiments) negative combination is 'availability' and 'price'. Gale (1955) states that the price of a commodity is depend on how it is demanded by the consumers. According to the Law of Supply and Demand, it is understandable that when the supply is low, the price increases. Therefore, when the services are not available to the riders, the prices increase. It is one of the reasons why the combination of 'availability' and 'prices' have one of the highest negative sentiments among the 15 combinations. The fares for both Grab Malaysia and Go-Jek Indonesia is calculated by an algorithm. Hence, when the available drivers are not enough to serve the increasing demand, the price will increase. Moreover, some riders fear the services not on par with the fare they paid, and the price surge even

higher during rainy seasons or peak hours. Therefore, the sentiment shows a negative trend when riders not able to get a service and the fare surge unexpectedly high.

After summarizing all the data collected into Table 4.2, all the dimensions were ranked accordingly in both Malaysia and Indonesia context. Based on RII, 'comfort' and 'availability' were ranked the first for both Grab Malaysia and Go-Jek Indonesia respectively. Grab Malaysia happened cases where rider complaint on the vehicle's hygiene, where there is pungent smell in the vehicle, or the cleanliness (Figure 5.1) and condition are not up to their satisfaction, makes the riders uncomfortable. On the other hand, for Go-Jek Indonesia, there were cases where riders reported that drivers refused to accept their order even though plenty of 'non-occupied' drivers shown in their e-hailing application. 'Price' was ranked 3rd in Malaysia but 6th in Indonesia. This is because Grab Malaysia are using cars to complete their service while Go-Jek Indonesia is mainly using motorbike. Thus, the price for using a car is relatively higher than motorbike.

Figure 5.1: Example of Negative Tweet on Cleanness of the Vehicle



Source: Norreen (2019)

A negative online sentiment's trend was found in both Grab Malaysia and Go-Jek Indonesia after analyzing the data. The reason for higher negative sentiments than positive may prompt by incidents. When rider experienced an unpleasant trip, they tend to express their dissatisfaction on Twitter. This is because riders know that their comments will be seen by the company (Harrison, 2019). However, when riders are satisfied, some of them may share their experience through social media, but most of them will just keep it with themselves.

After the implementation of new regulations, as the number of drivers decreases, the number of riders using the e-hailing service also decreases. Based on the analysis, the number of online sentiments collected after the implementation of new regulation also decrease. This may due to lesser riders are using the service.

In short, the overall online sentiment in both Malaysia and Indonesia e-hailing services shows a negative trend due to the service provided are not able to satisfy all the users.

5.2 Implications of the Study

This study contributes to 2 significant implications: 1) theoretical and 2) practical. First, not much studies or research conducted were focuses on the online sentiments of e-hailing services in Malaysia and Indonesia. This study focuses on the dominant player of the industry in both countries. The model proposed in this study has streamlined the SERVQUAL model into a model that is more suitable to the e-hailing industry. It consists of an additional dimension, 'price', which is different from those previous studies on service quality. This study allowed to identify the online sentiments towards the e-hailing services in both countries with similar background.

In future, service providers or any industry practitioners may use the proposed service quality model in this study to serve their customers better. According to the studies conducted on online sentiments, 'price' has become relatively important in assessing customers satisfaction towards a service, as consumers nowadays have become more price sensitive. When service providers focus on the dimensions studied to serve their customers better, customers will be more satisfied, and the future sentiments will show a positive trend.

5.3 Limitations of the Study

Only dominant players in the industry were being focused in this study and data were collected manually. Without the assist of data mining tools, some data may not be accurately analyzed or may be neglected. With the assists of data mining tools, there may be more than 688 relevant tweets collected, and the analysis conducted may be more accurate. Most of the Facebook posts and a few Twitter posts cannot be accessed due to the privacy issue and leads to the data collected is not comprehensive. Hence, some feedback or sentiments may be ignored.

5.4 Recommendations for Future Research

Future researchers are recommended to use data mining tools to collect a more comprehensive data, not only from Twitter, but also other social media platform such as Instagram and Facebook. Other e-hailing alternatives in the industry should also be focuses. In order to further refine the study model, in-depth study can be done instead mainly focusing on literature reviews to identify what other dimensions are concerned by the users of the service. More specific and precise keywords can be used when collecting data, and classify data using a better classifier, thus better results can be obtained.

5.5 Conclusion

This study has identified that the online sentiment regarding customer satisfaction in both Malaysia and Indonesia's e-hailing service shows a negative trend. Besides, through intensive study on the online sentiments, 'comfort' and 'availability' were concerned the most by both riders of Grab Malaysia and Go-Jek Indonesia. However, the significance difference shown in this study was, 'price' was ranked

3rd in Malaysia, but 6th in Indonesia. Study results collected shows that all the dimensions have higher negative sentiments than positive.

REFERENCES

- Agarwal, A., Xie, B., Vovsha, I., Rambow, O., & Passonneau, R. (2011, June). Sentiment analysis of twitter data. In *Proceedings of the Workshop on Language in Social Media (LSM 2011)* (pp. 30-38).
- Agatz, N., Erera, A., Savelsbergh, M., & Wang, X. (2010). Sustainable passenger transportation: Dynamic ride-sharing.
- Alamsyah, A., & Rachmadiansyah, I. (2018, March). Mapping online transportation service quality and multiclass classification problem solving priorities. In *Journal of Physics: Conference Series* (Vol. 971, No. 1, p. 012021). IOP Publishing.
- Amin, V. (2019, July 7). Renewed hope for Jakarta's three-wheeled taxis, thanks to e-hailing apps. *CNA*. Retrieved from <https://www.channelnewsasia.com/news/asia/jakarta-bajaj-grab-indonesia-ride-hailing-app-11689980>
- Amplayo, R. K., & Song, M. (2017). An adaptable fine-grained sentiment analysis for summarization of multiple short online reviews. *Data & Knowledge Engineering*, 110, 54-67.
- Anastasia, S., & Budi, I. (2016, October). Twitter sentiment analysis of online transportation service providers. In *2016 International Conference on Advanced Computer Science and Information Systems (ICACSIS)* (pp. 359-365). IEEE.
- Ariffin, E. (2018, February 21). Go-Jek prepared to further dominate Indonesia. *The ASEAN Post*. Retrieved from <https://theaseanpost.com/article/go-jek-prepared-further-dominate-indonesia>
- Ariffin, E. (2018, April 19). The dangers of a Grab Monopoly. *The ASEAN Post*. Retrieved from <https://theaseanpost.com/article/dangers-grab-monopoly>
- Ariffin, E. (2018, April 28). Companies are looking to fill the void left by Uber. *The ASEAN Post*. Retrieved from <https://theaseanpost.com/article/companies-are-looking-fill-void-left-uber-0>
- Arshad, N. H., Ahmad, F., Janom, N., & Mohamed, A. (2008). Online transportation services guideline for service quality. *WSEAS Transactions on Business and Economics*, 5(5), 201-209.
- Carley, K. M., Malik, M. M., Kowalchuck, M., Pfeffer, J., & Landwehr, P. (2015). Twitter usage in Indonesia. *Available at SSRN 2720332*.

- Cham, T. H., & Easvaralingam, Y. (2012). Service quality, image and loyalty towards Malaysian hotels. *International Journal of Services, Economics and Management*, 4(4), 267-281.
- Cham, T. H., Lim, Y. M., Aik, N. C., & Tay, A. G. M. (2016). Antecedents of hospital brand image and the relationships with medical tourists' behavioral intention. *International Journal of Pharmaceutical and Healthcare Marketing*, 10(4), 412-431.
- Cham, T. H., Ng, C. K. Y., Lim, Y. M., & Cheng, B. L. (2018). Factors influencing clothing interest and purchase intention: a study of Generation Y consumers in Malaysia. *The International Review of Retail, Distribution and Consumer Research*, 28(2), 174-189.
- Cham, T. H., Yet Mee, L., & Nai-Chiek, A. (2014). A study of brand image, perceived service quality, patient satisfaction and behavioral intention among the medical tourists.
- Chaudhry, B., El-Amine, S., & Shakshuki, E. (2018). Passenger Safety in Ride-Sharing Services. *Procedia computer science*, 130, 1044-1050.
- Cheah, J. H., Ting, H., Cham, T. H., & Memon, M. A. (2019). The effect of selfie promotion and celebrity endorsed advertisement on decision-making processes: A model comparison. *Internet Research*, 29(3), 552-577.
- Chu, M. M. (2019, June 8). No selfie, no ride, Grab tells users. *The Star Online*. Retrieved from <https://www.thestar.com.my/news/nation/2019/06/08/no-selfie-no-ride-grab-tells-users#:~:targetText=Compulsory%20step%3A%20In%20an%20announcement,a%20selfie%20by%20July%2012.&targetText=It%20said%20the%20selfie%20is,passenger's%20identity%20for%20future%20rides>.
- Damaini, A. A., Nugroho, G. S., & Suyoto, S. (2018). Fraud Crime Mitigation of Mobile Application Users for Online Transportation. *International Journal of Interactive Mobile Technologies (iJIM)*, 12(3), 153-167.
- Dhillon, D. S. (2018, December 5). Price control needed for e-hailing services. *The Star Online*. Retrieved from <https://www.thestar.com.my/opinion/letters/2018/12/05/price-control-needed-for-e-hailing-services/>
- Ellis, J. (2019, January 31). Almost 30% of Go-Jek, 5% of Grab e-hails in Indonesia are fraudulent, study claims. *News*. Retrieved from <https://www.techinasia.com/30-gojek-5-grab-e-hails-indonesia-fraudulent-study-claims>
- Farin, N. J., Rimon, M. N. A. A., Momen, S., Uddin, M. S., & Mansoor, N. (2016, December). A framework for dynamic vehicle pooling and ride-sharing system. In *2016 International Workshop on Computational Intelligence (IWCI)* (pp. 204-208). IEEE.

- Findley, D. J., Cunningham, C. M., & Hummer, J. E. (2011). Comparison of mobile and manual data collection for roadway components. *Transportation Research Part C: Emerging Technologies*, 19(3), 521-540.
- Gale, D. (1955). The law of supply and demand. *Mathematica scandinavica*, 155-169.
- Go, A., Bhayani, R., & Huang, L. (2009). Twitter sentiment classification using distant supervision. *CS224N Project Report, Stanford*, 1(12), 2009.
- Go-Jek most popular ride-hailing app: Survey. (2018, February 20). *The Jakarta Post*. Retrieved from <https://www.thejakartapost.com/life/2018/02/20/indonesias-most-popular-ride-hailing-app-survey.html>
- Malay Mail*. (2019, May 3). In Malaysia, almost everyone on social media, says chief statistician. Retrieved from <https://www.malaymail.com/news/malaysia/2019/05/03/in-malaysia-almost-everyone-on-social-media-says-chief-statistician/1749416>
- Jamil, S. (2019, August 19). Syed Saddiq wants to bring Go-Jek to Malaysia. *The Star Online*. Retrieved from <https://www.thestar.com.my/news/nation/2019/08/19/syed-saddiq-wants-to-bring-go-jek-to-malaysia>
- Khidhir, S. (2019, February 28). E-hailing alternatives in Malaysia. *The ASEAN Post*. Retrieved from <https://theaseanpost.com/article/e-hailing-alternatives-malaysia>
- Lai, A. (2019, July 12). E-hailing firms advise passengers to prepare for new rules. *The Star Online*. Retrieved from <https://www.thestar.com.my/news/nation/2019/07/12/ehailing-firms-advise-passengers-to-prepare-for-new-rules>
- Liat, C. B., Mansori, S., & Huei, C. T. (2014). The associations between service quality, corporate image, customer satisfaction, and loyalty: Evidence from the Malaysian hotel industry. *Journal of hospitality marketing & management*, 23(3), 314-326.
- Lima, A. C., & de Castro, L. N. (2012, November). Automatic sentiment analysis of Twitter messages. In *2012 Fourth International Conference on Computational Aspects of Social Networks (CASoN)* (pp. 52-57). IEEE.
- Ma, L., Li, T., Wu, J., & Yan, D. (2018). The Impact of E-Hailing Competition on the Urban Taxi Ecosystem and Governance Strategy from a Rent-Seeking Perspective: The China E-Hailing Platform. *Journal of Open Innovation: Technology, Market, and Complexity*, 4(3), 35.

- Mead, N. V. (2016, November 23). The world's worst traffic: can Jakarta find an alternative to the car?. *The Guardian*. Retrieved from <https://www.theguardian.com/cities/2016/nov/23/world-worst-traffic-jakarta-alternative>
- The Borneo Post*. (2019, July 10). New e-hailing regulations take effect from Friday. Retrieved from <https://www.theborneopost.com/2019/07/10/new-e-hailing-regulations-take-effect-from-friday/>
- Parasuraman, A., Zeithaml, V. A., & Berry, L. L. (1985). A conceptual model of service quality and its implications for future research. *Journal of marketing*, 49(4), 41-50.
- Park, J. W., Robertson, R., & Wu, C. L. (2006). The effects of individual dimensions of airline service quality: Findings from Australian domestic air passengers. *Journal of Hospitality and Tourism Management*, 13(2), 161-176.
- Poliakova, A. (2010). Customer satisfaction index with a quality of service in public mass transport. *Transp. Commun*, 2, 43-49.
- Prabowo, Y. (2018, February 6). Uber, Go-Jek, Grab: What do People in Indonesia Actually Want from Ride-Hailing Apps?. *ecommerceIQ*. Retrieved from <https://ecommerceiq.asia/cp-ride-hailing-apps-in-indonesia/>
- Rambocas, M., & Pacheco, B. G. (2018). Online sentiment analysis in marketing research: a review. *Journal of Research in Interactive Marketing*, 12(2), 146-163.
- Saragih, M. H., & Girsang, A. S. (2017, November). Sentiment analysis of customer engagement on social media in transport online. In *2017 International Conference on Sustainable Information Engineering and Technology (SIET)* (pp. 24-29). IEEE.
- Septiani, R., Handayani, P. W., & Azzahro, F. (2017). Factors that affecting behavioral intention in online transportation service: Case study of GO-JEK. *Procedia Computer Science*, 124, 504-512.
- Sidner, S. (2010, November 23). Indonesia: Twitter nation. *CNN.com*. Retrieved from <http://edition.cnn.com/2010/TECH/social.media/11/23/indonesia.twitter/index.html>
- Silalahi, S. L. B., Handayani, P. W., & Munajat, Q. (2017). Service quality analysis for online transportation services: Case study of GO-JEK. *Procedia Computer Science*, 124, 487-495.

- Tan, Z. X. (2019, July 12). Malaysia's strict e-hailing rules come into effect today, price hikes and longer waiting time anticipated. *KrASIA*. Retrieved from <https://kr-asia.com/malaysias-strict-e-hailing-rules-come-into-effect-today-price-hikes-and-longer-waiting-time-anticipated>
- Thia, T. (2010, August 12). Indonesia has highest Twitter penetration. *ZDNet*. Retrieved from <https://www.zdnet.com/article/indonesia-has-highest-twitter-penetration/>
- Walton, K. (2019, May 15). Hi @gojekindonesia, aku barusan dari Kedutaan Besar Australia. Ada sekitar 10 abang Gojek yang kena orderan fiktif. Pemesan menggunakan nama @DubesAustralia Gary Quilan. Semoga segera pengeluaran mereka diganti. Ada yang habis 400rb, kali 10 orang. Terima kasih. [Tweet]. Retrieved from <https://twitter.com/waltonkate/status/1128562432664715264>
- Wang, L., & Wan, Y. (2011, June). Sentiment classification of documents based on latent semantic analysis. In *International Conference on Computer Education, Simulation and Modeling* (pp. 356-361). Springer, Berlin, Heidelberg.
- Windasari, I. P., Uzzi, F. N., & Satoto, K. I. (2017, October). Sentiment analysis on Twitter posts: An analysis of positive or negative opinion on GoJek. In *2017 4th International Conference on Information Technology, Computer, and Electrical Engineering (ICITACEE)* (pp. 266-269). IEEE.
- Wu, T., Zhang, M., Tian, X., Wang, S., & Hua, G. (2020). Spatial differentiation and network externality in pricing mechanism of online car hailing platform. *International Journal of Production Economics*, 219, 275-283.
- Ye, Q., Zhang, Z., & Law, R. (2009). Sentiment classification of online reviews to travel destinations by supervised machine learning approaches. *Expert systems with applications*, 36(3), 6527-6535.