Online Impressions On E-Hailing Services: A Study On Positive And Negative Sentiments On Grab Malaysia And Go-Jek Indonesia On Twitter Platform

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Abstract: The presence of mobile-internet has led to the emergence of the e-hailing industry. As the e-hailing services usage increased, it led riders to share their opinions or discontent after indulging in the services. Therefore, in this study, online sentiments on social media (Twitter) with specific keywords mentioned, 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 included were: ‘Availability’, ‘Accessibility’, ‘Information’, ‘Comfort’, ‘Safety’, and the additional dimension of ‘Price’. All the data (tweets) collected were classified into either a positive or negative sentiment, and to respective dimensions manually, by referring to keywords. 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, and the results shown were 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.

Keywords: E-hailing, Twitter, Online Sentiments, Transportation Service Quality Model

1. INTRODUCTION

Nowadays, 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 [1]. There are several names for online transportation services such as ride-hailing or ride-sharing, but in Malaysia, it is commonly known as e-hailing service. [2] state that, in both developed and emerging countries, the density of vehicles has increase dramatically, regardless of private cars or commercial vehicles. The effective use of the under-utilized vehicle by e-hailing services presents an opportunity to increase the occupancy rates, in turn, increased the efficiency of the public transportation systems [3], [4]. In fact, the issue of traffic congestion can be minimized. The ubiquitousness of Internet-enabled mobile allowed 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 [5]. 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 [6], [7]. Besides, 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 [8]. When the rides demand increase, the demand for service quality follows. With the rising awareness of e-hailing services, service quality provided by the e-hailing service companies must be improved to gain competitive advantages over their competitors.

Business organizations widely use Twitter as a platform to support their business operations or as an engagement tool [9]. The prevalence of social media led riders to share their reviews or experiences after using a product or service because it acts as a room for customers to share opinions or comments. This allowed companies to get feedback and improve on their services or products provided, by observing and evaluating the sentiments or responses. Through analyzing user’s reactions, tweets can be further study by classifying them using a categorize model such as Transportation Service Quality Model (TSQM) proposed by [10] by adapting the SERVQUAL model proposed by [11] and Customer Satisfaction Index (CSI) criteria proposed by [12].

With the dramatic rise in the use of e-hailing service, the demand for better service quality was expected as well. [13] states 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 were frequently discussed by the users on social media. 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 [14]. This study would also like to study the effects of new regulation implementation on the online sentiments, thus, with lesser drivers to serve the increasing demand, negative trends of online sentiment towards e-hailing services in Malaysia may be expected after the implementation of new regulations.

This study addresses the following questions: 1) What is the online sentiment regarding the rider’s satisfaction in Malaysia and Indonesia e-hailing services?, 2) What are the differences in the online sentiment regarding the rider’s satisfaction between Malaysia and Indonesia e-hailing services?. 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 provide a new perspective of service quality that specify the e-hailing industry. Therefore, the service industry may improve on their service quality according to the model proposed, to identify which dimension concerned the most by the customers.

2. LITERATURE REVIEW

E-hailing service is a well-known transportation service in which traditional public transport service is being modernized through the implication of technology [1]. Both users and drivers are connected through the e-hailing platform in real-time. This service 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. 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 [15], [16]. 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 [17].

After Uber left the Southeast Asian market, consumers afraid that Grab will monopolize the whole e-hailing market [18]. However, [19] also reported that several startups can be seen to have entered the e-hailing market in a desire to fight for the opportunity in the markets. According to [20], MyCar, EzCab, Ryde, and Grab are among the popular e-hailing alternatives that can be found in Malaysia, while Go-Jek, Bangjekk, Transjek, and Blue-Jek are the popular e-hailing providers in Indonesia [21]. Among all the alternatives, Grab and Go-Jek is most used by the local riders and is currently the dominant player in the e-hailing industry in both Malaysia and Indonesia, respectively.

The prevalence of social media led riders to share their reviews or experiences after indulging in the services. Twitter is a popular microblogging platform frequently used to create a status message, or often called tweet, on their real-time reactions and opinions about everything [22], [23]. In Malaysia, 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 [24]. 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. On the other hand, Twitter has been adopted by Indonesian in the early stages and they may be considered as the most prolific Twitter users [25]. [26] and [27] also reported that the Twitter penetration of Indonesia reaches 20.8%, which is the highest among all the countries worldwide.

E-hailing service is a topic being widely discussed by the users on Twitter, thus it becomes more convenient and easier to collect thousands of tweets for the research. As a result of short texts and simplified communication, all the information update can be processed faster. Furthermore, there are several types of accounts on Twitter such as ‘verified’ accounts, individual account 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 and serves a research purpose where people know that these ‘verified’ accounts are guaranteed not bots, and maybe more reliable compared to those normal individual accounts [25].

Researchers study consumer feelings toward a product or service through extracting and classifying the online sentiments posted on social media [28], [29]. These online sentiments allowed service providers to monitor brand attitudes and emerging trends then to promote their products in their respective markets [30], [31], [32]. A technique where the purpose of a classification task is to assign a category according to the sentiment expressed and to understand how interested parties interpret the emotion within the tweets can be done via sentiment analysis [31]. It is widely conducted to determine the true meaning of the writer. A similar technique was employed by [33] in research to analyse the feedback data from the Global Support Services survey, and the purpose was to analyse the role of a linguistic feature. [30] also stated 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. Service providers investigate the online sentiments to maintain on the positive and improvise on the negative ones to serve the market better, while consumers review the online sentiments to decide whether to the presented products or services [34].
All the six major dimensions proposed in this study were derived from various studies and research. Five of the dimensions were from Transportation Service Quality Model proposed by [10] by using SERVQUAL model [11] as the foundation of this study and adapting the Customer Satisfaction Index criteria proposed by [12], with an additional dimension, ‘Price’ (refer to Figure 2.1). The purpose of the study conducted by [10] is to define the problems of e-hailing companies and to propose a problem-solving priority, while the quality criteria proposed by [12] aimed to evaluate the passenger’s satisfaction level towards transportation service quality. Meanwhile, SERVQUAL model proposed by [11] is to be used in any service industry as a guideline to serve their customer better [28], [35], [36]. The research conducted on service quality 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. Therefore, the SERVQUAL model has been adapted by researchers to fit the actual service environment, and act as a yardstick in the research.

‘Price’ acts as an externality that greatly affects the usage of services [37]. Hence, the dimensions included in the model proposed in this study will be ‘Availability’, ‘Accessibility’, ‘Information’, ‘Comfort’, ‘Safety’, and ‘Price’. The new model proposed streamlined all the models from previous studies on service quality, and the additional dimension of ‘Price’ allowed the Transportation Service Quality Model to be more comprehensive and better suits the e-hailing industry. As the focus of this study is to analyze the online sentiments of users towards the e-hailing services, thus, there is a combination of two set elements in this study: 1) SERVQUAL dimensions, and 2) online sentiment elements. The e-Service Quality Features proposed by [38] were also included as the determinants for the major dimensions in this study. The study conducted by [38] was intended to explore the service quality in several online service industries. Moreover, the determinants in a research model proposed by [1] were also included as it aimed to determine the online transportation services in Indonesia, which is Go-Jek.

After an intensive literature review, the description for each dimension was tabulated (refer to Figure 2.2). All the parameters, determinants for the six main dimensions were combined and categorized from various studies and research according to the closest meaning, keywords, definition, description, and measurement items proposed (refer to Figure 2.3).

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

| Parasuraman et al. (1985) | Polialova (2010) | Alamsyah & Rachmadiansyah (2018) | Dimensions Proposed in This Study |
|--------------------------|-----------------|---------------------------------|----------------------------------|
| Reliability             | Availability    | Availability                    | Availability                     |
| Responsiveness          | Access          | Accessibility                   | Accessibility                    |
| Competence              | Information     | Information                     | Information                     |
| Access                  | Time            | Time                            | Time                            |
| Courtesy                | Customer Service| Customer Service                | Customer Service                |
| Communication           | Comfort         | Comfort                         | Comfort                         |
| Credibility             | Safety          | Safety                          | Safety                          |
| Security                | Environment     | Environment                     | Environment                     |
| Understanding/          |                 |                                 |                                 |
| Knowing the Customer    |                 |                                 |                                 |
| Tangibles               |                 |                                 |                                 |

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| Service Quality Dimensions | Descriptions | Sources | Expected Sentiments |
|---------------------------|--------------|---------|---------------------|
| Availability              | The availability of transportation service whenever, and whenever the users need it. | Almeny and Rachmadianmiah (2018), Polakova (2010), Parunungan et al. (1985), Arshad et al. (2006) | +ve |
| Accessibility             | The ease of use of the service at anytime, anywhere, and in any conditions. | Almeny and Rachmadianmiah (2018), Polakova (2010), Parunungan et al. (1985), Septian et al. (2017), Arshad et al. (2006) | +ve |
| Information               | Users are well-informed with all travel information such as travel fare, waiting time, pickup location, driver’s name, and real-time traffic conditions. | Almeny and Rachmadianmiah (2018), Polakova (2010), Parunungan et al. (1985), Arshad et al. (2006) | +ve |
| Comfort                   | The increase in information availability leads to greater confidence of users in using the services. | Almeny and Rachmadianmiah (2018), Polakova (2010), Parunungan et al. (1985), Park et al. (2006) | +ve |
| Safety                    | The company effort to ensure that the users are comfortable when using the services. | Almeny and Rachmadianmiah (2018), Polakova (2010), Parunungan et al. (1985), Septian et al. (2017), Arshad et al. (2006), Park et al. (2006) | +ve |
| Price                     | Provide additional services to enhance the experience of the users in using the services. | Park et al. (2006), Wu et al. (2018) | -ve |

Figure 2.2: Proposed Online Sentiment Analysis Based on Transportation Service Quality Model

| Dimensions | Parameter/Determinants | Keywords/Definition/Description/Measurement Items | Sources |
|------------|------------------------|-----------------------------------------------|---------|
| Availability | Availability of transportation service at anytime, anywhere, and in any condition | Almeny and Rachmadianmiah (2018) |
| Availability | Tickets procurement | Polakova (2010) |
| Availability | Available linkage to other transportation systems | |
| Available of trips | Comfort trip schedule | Park et al. (2006) |
| Available of trips | Availability of service required | |
| Reliability | Perform service at the designated time | Parunungan et al. (1985) |
| Responsiveness | Readiness to provide service | |
| Tangibles | Actual evidence of the service | |
| Reliability | Probability to provide customized service | Arshad et al. (2007) |

| Accessibility | Ease of use of the service at anytime, anywhere, and in any condition | Almeny and Rachmadianmiah (2018) |
| Access | Geographic and time accessibility, Frequency of service | Polakova (2010) |
| Perceived ease of use | Ease of operating booking process | |
| Perceived usefulness | Usabilities | Septian et al. (2017) |
| Ease of use | Readiness for user to check out, Rapidity to initiate order | Arshad et al. (2007) |
| Access | Approachability and ease of context | Parunungan et al. (1985) |

| Information | Available of information | Almeny and Rachmadianmiah (2018) |
| Information | Available of services | Polakova (2010) |
| Information | Travel fare | |
| Information | Online service information | Arshad et al. (2007) |
| Communication | Keep customers informed | Parunungan et al. (1985) |
Similar studies were conducted by different researchers for online sentiments on e-hailing services. The study conducted by [10] on analyzing 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, the results of a study conducted by [9] 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. [8] analyzed the sentiments of Go-Jek on Twitter posts in one of their studies. Every tweet, including positive or negative, was classified using machine learning, the Support Vector Machine (SVM). All the emoticon was converted beforehand to avoid being deleted. However, the test still resulted in an 86% accuracy and 14% of prediction error. Moreover, [21] also conducted a study on analyzing the service quality of e-hailing services but mainly focused on Go-Jek. The result of the analysis shows that ‘perceived cognitive’, ‘content usefulness’, and ‘ease of use’ have the highest-weighted criterion for service quality, information quality, and system quality dimension, respectively.
3. METHODOLOGY

This study consists of mixed-method research, which is a combination of quantitative and qualitative research. In the data collection process, Twitter is the only social media platform used to collect all the data. Tweets represent the online sentiments, in turn, representing the user’s satisfaction regarding the e-hailing services provided in both Malaysia and Indonesia. This study uses a descriptive approach in data collection and was conducted by filtering and collecting all the relevant tweets manually on Twitter, by referring to the description for the six dimensions in Figure 2.2. 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 [10].

The raw data collected in this study are any tweets from Twitter that related to Grab Malaysia and Go-Jek Indonesia. There are 2 major sources of data: 1) Go-Jek’s (@gojekindonesia), and 2) Grab’s official Twitter account (@grabMY). 8 months of data were collected from 1st January to 22nd September 2019 and all the tweets regardless of languages were captured. Some of the tweets in Bahasa Indonesia were further Google translate into English to understand the intended meaning that the writers wish to convey. Most of the tweets are in text-based but there are plenty of tweets with pictures or images. This allowed the interested parties to further understand the actual idea or situation of the incidents. Besides, tweets with emoticons, which also allowed the writer to convey their expression towards their services experience. However, due to privacy concern, only public tweets were collected. Those users who commented under a ‘Thread’ where the keyword was mentioned were also collected if they were commented by different users or different issues were discussed. Thus, in this study, public sentiments information can be identified through monitoring the tweets, and knowing the sentiments the allowed to determine which dimensions are most concerned by the users [8].

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. Hence, the trends of online sentiments can be analysed more accurately. Furthermore, the trends of online sentiments during the period such as festive seasons, long-weekend holidays and implementation of new regulations will be further analysed, due to the usage of e-hailing services during these periods may vary, and potentially affecting the general trends. However, in this study, only positive and negative sentiments were captured and analysed.

Classification of tweets was divided into two parts. First, all the tweets captured were classified into 2 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 to express their feelings. This is because software such as Support Vector Machine, may not be able to identify the true meaning of tweets with sarcastic meanings but with positive emojis, as some elements are not able to be analyzed accurately by software means [39]. However, for simplicity, only positive and negative sentiments were captured. Vulgar wordings or tweets with reverse meaning also serves as an indicator to determine whether the tweets are express in positive or negative sentiment.

After tweets captured were classified into positive or negative sentiments, the tweets were then categorized into the six dimensions respectively: 1) ‘Availability’, 2) ‘Accessibility’, 3)
‘Information’, 4) ‘Comfort’, 5) ‘Safety’, and 6) ‘Price’. The tweets were categorized based on the closest meaning or if the content of the tweets is related to the features of the dimensions (refer to Figure 2.3).

Table 3.1: Example of Tweet Classification by Sentiment

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

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

| Dimension | Example Tweets | Sentiment |
|-----------|----------------|-----------|
| Availability | Salam @GrabMY you suck! Been waiting for 30 minutes. fxxk off! | -ve |
| Accessibility | 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 | -ve |
| Information | Super impressed with @GrabMY. The app translated my messages and made the pickup easy!! | +ve |
| Comfort | @gojekindonesia <3 thank you for providing some great drivers <3 | +ve |
| Safety | Taking @GrabMY to KLIA and driver decides to drive without using predesignated route and stuck in traffic for more than 20mins. #Grab | -ve |
Statistical Package for Social Science (SPSS) was used to process then analyze all the raw data collected to obtain results such as frequencies for total sentiments, sentiments for both Malaysia and Indonesia, and descriptive of tweets with two or more dimensions. On top of that, it is also used to calculate the possible combination for six dimensions, which resulted in 15 different combinations, as there are tweets with sentiments on various dimensions. Moreover, the tweets collected for Grab Malaysia were divided into 2 periods to further analyze the effects on sentiments before and after the implementation of new regulation, the Private Service Vehicle (PSV) license in July 2019. Thus, SPSS helps to analyze whether the online sentiments vary before and after the implementation of the new regulation.

4. RESULTS AND FINDINGS

A total of 688 tweets were collected, where 573 (83.28%) are negative and 115 (16.72%) are positive sentiments (refer to Figure 4.1). Out of 688 tweets collected, 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 were collected 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](image)
Figure 4.2: Percentage of Tweets for Grab Malaysia and Go-Jek Indonesia

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

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

Figure 4.5: Percentage of Negative and Positive Tweets with 2 or More Dimensions
Out of 688 tweets collected, 842 sentiments were identified. 140 (16.63%) out of 842 sentiments are positive, while the remaining 702 (83.37%) sentiments are negative. In overall, by referring to Figure 4.6, ‘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%). Furthermore, by calculating the Relative Importance Index (RII), ‘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. The ranking for the first and second dimensions in both Malaysia and Indonesia are almost similar. However, ‘Price’ was ranked third in Malaysia but sixth in Indonesia (refer to Figure 4.6).

The total number sentiments (842 sentiments) for the 6 dimensions are different from the total number of tweets collected (688 tweets). This is because some tweets are with sentiments on various dimensions. The positive and negative sentiments for each dimension, expected and actual sentiments, and the relative importance for each dimension were tabulated and ranked accordingly based on RII calculated in Figure 4.6, while the results for the 15 possible combinations of the six dimensions were tabulated in Figure 4.7. Only distinct results were reported, while other results were clearly tabulated in both Figure 4.6 and 4.7.

Out of 143 tweets, 42 tweets commented both ‘Availability’ and ‘Comfort’ in the same tweet. This combination shows the highest positive and negative sentiments. 32 (76.19%) out of 42 tweets are negative, and the remaining 10 (23.81%) are positive tweets. However, 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’.

Furthermore, 33 (23.08%) out of 143 tweets commented both ‘Comfort’ and ‘Safety’ at the same time, which has the second highest combination in terms of negative sentiments. 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’, while 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.

On top of that, 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’, together 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’. This combination shows the third highest in terms of negative sentiment.
Note: *Positive if % of positive tweets > negative tweets, and vice versa.

| Dimensions | Countries | Positive Sentiment (s) | Negative Sentiment (s) | Total | Relative Importance Index (RRI) | Relative Ranking | Ratio (Positive/Negative) | Expected Sentiment | Sentiment* |
|------------|-----------|------------------------|------------------------|-------|-------------------------------|------------------|--------------------------|------------------|-----------|
|            |           | 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 | +ve | -ve |
| Accessibility | Malaysia | 6 | 4.20 | 34 | 4.84 | 40 | 9.13 | 0.0475 | 5 | 0.1765 | +ve | -ve |
|             | Indonesia | 6 | 4.20 | 42 | 5.98 | 48 | 10.27 | 0.0570 | 4 | 0.1429 | +ve | -ve |
| Information | Malaysia | 6 | 4.20 | 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 | +ve | -ve |
| 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 | +ve | -ve |
| 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 | +ve | -ve |
| 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 | +ve | -ve |
| Total | | 140 | 100.00 | 702 | 100.00 | 842 | 200.00 | 1.0000 | | | |

Figure 4.7: Frequencies for the Combination of 2 or More Dimensions

In addition, to understand the influence of new regulation on online sentiments, the total tweets collected for Grab Malaysia were divided into 2 periods: January to June, and July to September (refer to Figure 4.8), as this study would like to analyze whether there is a strike on negative sentiments after the implementation of new e-hailing regulations on 12th July 2019. According to [14], the decrease in the number of drivers available in the market, may cause an increase in prices and longer waiting time, then leads to higher negative sentiments.

A total of 316 tweets were collected for January to June 2019 in Malaysia sample (refer to Figure 4.9). Out of 316 tweets, 35 tweets are positive, and the remaining 281 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’. On the other hand, the total number of tweets collected from July to September 2019 for Malaysia sample is 124. Out of 124 tweets, 20 tweets are positive, and 104 are negative. However, the total number of dimensions commented will not be equal to the number of tweets collected. 36 tweets commented on the dimension ‘Availability’, 12 commented on ‘Accessibility’, 12 commented on ‘Information’, 32 commented on ‘Comfort’, 11 commented on ‘Safety’, and the remaining 21 tweets commented on ‘Price’.
4.1 Discussions on Major Findings

4.1.1 Combination of Dimensions

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 [40]. A research conducted by [12] 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 [41]. Most of the riders’ complaint that the drivers have completed their service in the mobile application without picking them up 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’. [42] states that the price of a commodity depends 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 supply of services is not able to meet the riders’ demand, 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 according to the algorithm. 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.

4.1.2 Ranking for Dimensions

After summarizing all the data collected into Figure 4.6, 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 a pungent smell in the vehicle, or the cleanliness and the condition is not up to their satisfaction, then 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.

4.1.3 Difference in Ranking between Malaysia and Indonesia

‘Price’ was ranked third in Malaysia but sixth 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 of using a car is relatively higher than the motorbike.

4.1.4 Overall Online Sentiments in both Grab Malaysia and Go-Jek Indonesia

A negative online sentiment 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 [43]. 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. 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.

4.1.5 Implementation of New Regulation

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. Since the data was collected for only two months after the implementation of new regulation, the effects cannot be fully analyzed at present.

5. IMPLICATIONS AND CONCLUDING REMARK

This study contributes to 2 significant implications: 1) theoretical and 2) practical. First, limited studies or research conducted were focuses on the online sentiments of e-hailing services in both Malaysia and Indonesia, thus 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 differ from those previous studies and research model on service quality. This study further allowed to identify the online sentiment trend towards the e-hailing services in both countries with similar cultural 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 may show a positive trend.

Only dominant players in the industry were being focused on this study and data were collected manually. Thus, future researches are encouraged to involve other e-hailing alternatives in the industry and recommended to use data mining tools to collect more comprehensive data. With the assists of data mining tools, there may be more than 688 relevant tweets collected, and the analysis conducted may be more accurate. Besides, 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 and categorizing data using a better classifier, thus better results can be obtained.

In a nutshell, this study has identified that the online sentiment regarding customer satisfaction in both Malaysia and Indonesia’s e-hailing service shows a negative trend. Furthermore, through the intensive study on the online sentiments, ‘Comfort’ and ‘Availability’ were concerned the most by both riders of Grab Malaysia and Go-Jek Indonesia. On top of that, the significance difference shown in this study is the ‘Price’ dimension. ‘Price’ was ranked third in Malaysia, but sixth in Indonesia. Study results collected shows that all the dimensions have higher negative sentiments than positive.

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