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SERVICE QUALITY ANALYSIS OF ONLINE TRAVEL AGENCIES (OTA) USING MULTICLASS CLASSIFICATION

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Abstract: The simplicity provided by Online Travel Agencies (OTA) does not always make customers feel satisfied. Sometimes the customers get some problems with the company services. This finally led customers to give their opinion on social media. Large numbers of data in social media are capable to be an information source for the company to get customer insight. This study aims to determine the quality of OTA services based on customer opinions on social media Twitter. The method used in this study is a multiclass classification with the Naïve Bayes Classifier model. Furthermore, each opinion is classified into positive and negative sentiment groups. Multiclass classification results show that Traveloka's service quality is not good enough because six of the seven dimensions of service quality tend to have a negative sentiment. While the quality of Tiket.com and Pegipegi services can be assumed to be quite good because three of the seven dimensions of service quality get a more positive sentiment.
Keywords: Customer Insight, Multiclass Classification, Sentiment Analysis, Service Quality

INTRODUCTION

The growth of internet users provides opportunities for e-commerce businesses. Online Travel Agencies (OTA) as an online reservation platform is one of the leading and rapidly growing business in Indonesian e-commerce. OTA gives the simplicity for the customers, but it does not always make the customers feel satisfied. Sometimes the customers get some problems with the company services. This finally led the customers to give their opinion about its services. Social media that is popular among the people is used to express the feeling, views, feedback, opinions, and the others' opinions which are important in various way (Shoeb & Ahmed, 2017). The data that users left on social media and can be accessed by the public is called User-Generated Content (UGC) (Moens et al, 2014). One of the social media that is often used by Indonesian people is Twitter. It is proven by the research results conducted by We Are Social (2019) as of January 2019. It shows that Twitter is in the sixth rank based on the most active social media platform with 52% as a penetration rate.

According to DailySocial survey (2018) the three most popular OTA services in Indonesia are Traveloka, Tiket.com, and Pegipegi. These OTA also use Twitter as a marketing tool and media to communicate with their customers. Tweets exist in Official Account Twitter of these OTA contain information about the company and also users' opinion about services itself. As an OTA in Indonesia, the company must be able to know and map the opinions given by the customers including complaints, opinions, even suggestions. As an information source, UGC can be used to recognize users' opinions (Olmedilla, 2016). This information can help the company to get customer insight where the company is capable to identify the advantages and conduct the evaluation to improve its service quality.

Providing the best service to fulfill customer expectations regarding company services is a challenge for OTA (Yuliandari & Yusrizal, 2018). The other challenge is gaining customer satisfaction. As stated by Wijaya (2018) one of the company's long-term goals in marketing strategies is managing customer satisfaction and loyalty. To

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compete in the industry, the company must present good service quality. The service quality of the company can be observed from the performance of each service quality dimension. Electronic service quality dimensions such as efficiency, fulfillment, system availability, privacy, responsiveness, compensation, and contact can measure e-commerce service quality performance (Parasuraman, 2005).

The method applied to understand the company service quality is multiclass classification. It helps to classify the opinions into service quality dimensions. Besides that, sentiment analysis applied to classify the opinions into positive and negative sentiment. Positive sentiment contains praise or other things related to customer satisfaction, while negative sentiment contains complaints or constraints in using the services. This research aims to determine the quality of OTA services by exploring and describing customers' opinions on social media Twitter related to their feeling and experience in using OTA services. The result of this research can be applied to evaluate the service quality of OTA services.

Marketing is an organizational function that consists of a series of processes to create, communicate, deliver, and exchange offers that have value for customers, clients, partners, and society in general (Armstrong et al, 2015). Marketing activities carried out as a company effort in identifying and meeting human social needs to give the benefits (Kotler & Keller, 2016).

Hawkins & Mothersbaugh (2016) propose that consumer behavior is the study of individuals, groups, or organizations in choosing, protecting, using, and disposing of the products, services, experiences, or ideas to fulfill the needs and recognize the impacts of this approach for consumers and public. Customer behavior also defined as customer actions that begin with a sense of need and desire, trying to get the product, consuming it, and ended with post-purchase actions like satisfied or dissatisfied feelings (Sangadji & Sopiah, 2013). Besides that, customer behavior is included in the ongoing process where the customers carry out the purchase transaction process until they receive the goods or services they bought (Solomon, 2018).

Service quality is the level of advantages expected by consumers and control over it to fulfill customers' desire, in accomplishment, it is important to improve the service quality and maintain it at the highest level (Wirtz & Lovelock, 2016). The online business brings out the quality of services called electronic service quality (E-Servqual). E-servqual is defined as an overall evaluation and assessment of electronic service advantages in virtual markets (Komara, 2014). The service quality dimension for measuring electronic service consists of two scales (Parasuraman, 2005). The first scale, the basic electronic service quality (basic E-S-QUAL) consists of efficiency, fulfillment, system availability, and privacy dimension. The second scale, the electronic recovery service quality (E-RecS-Qual) consists of responsiveness, compensation, and contact dimension. The definition of each dimension is as follows.

1. Efficiency, the company's ability to provide services for customers to access and use the company's website easily and quickly.
2. Fulfillment, the extent to which the site's promises regarding shipping orders and service availability are fulfilled.
3. System availability refers to the technical functions of the website that is running properly.
4. Privacy, the extent to which a site provides security and protects customer information.
5. Responsiveness, the company's ability to provide fast service and assist customers in handling requests, inquiries, and complaints.
6. Compensation, the extent to which the site compensates customers if there is a problem.

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7. Contact, the availability of communication for assistance via telephone or online customer service.

Customer insight is the latest form of marketing by utilizing customers as a source of information to understand customers and markets as the basis for the creation of customer value, customer involvement, and customer relationships (Kotler & Armstrong, 2016). Good customer relationship management is the basis of good customer insight, so the company must capable to position itself as to the compliance of customers' and stakeholders' needs (Chamlertwat et al, 2012). Customer insight can be identified conventionally through formatted customer survey, or even further by analyzing large numbers of available online data using big data tools (Liu et al, 2019).

METHODS

This research uses a qualitative method. The population in this research is users' opinions on social media Twitter regarding OTA Traveloka, Tiket.com, and Pegipegi. While the sample is users' opinions that are collected during two months starting on 1st September 2019 until 31st October 2019. The data is collected using Twitter API with some keywords related to the objects. The method applied in this research is the multiclass classification.

This research also refers to previous research conducted by Sari et al (2018) where the research uses the theory of multiclass classification to measure e-commerce service quality where the result of the study can recognize customer perception of the services and help the company to evaluate their service quality.

The workflow of this research as shown in Figure 1.

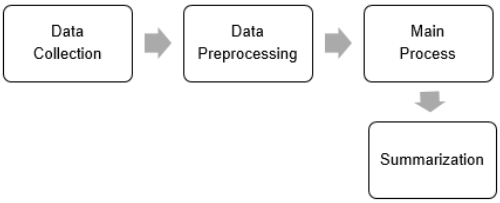

Figure 1. Research Workflow
Source: Created by Author (2019)

The research workflow is divided into four sections. It starts with data collection, data preprocessing, the main process, and summarization. Data collection is the step where the data is collected. The text data from social media is unstructured data, thus the data needs to be cleaned. Data preprocessing is the step to prepare the data where the data is cleaned and it becomes the structured data. In this process, there are 4.661 structured data with 2.021 data for Traveloka, 1.632 data for Tiket.com, and 1.008 data for Pegipegi. The main process consists of two sub-processes. They are multiclass classification to classify the data into electronic service quality dimensions and sentiment analysis to classify the data into positive and negative sentiment. Both of these processes utilize RapidMiner machine learning processing using a Naïve Bayes Classifier model. In the main process, the data is split into training and testing data with a proportion of 80%:20%. The training data is used to helps machine learning in predicting the testing data. The example of multiclass classification is shown in Table 1, while the example of sentiment analysis is shown in Table 2. The last section is summarization. It is a step to conclude the result from the analysis process where it is capable to help the company to improve the performance of the company's service quality.

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Table 1. Classification Example of Multiclass Classification

Tweet	Dimension
@pegipegi I'm confused, min, use the application	Efficiency
It's been twice the pegipegi, the promo is really ok	Fulfillment
An error from yesterday, my father wanted to buy a ticket from Tiketdotcom and Pegegegi, I couldn't.	System Availability
How come my notification entered the application even though I'm not using it	Privacy
I've made the submission of a return until now there has been no response	Responsiveness
yesterday the replacement was canceled and continued to be compensated	Compensation
Existing contacts cannot be contacted at all	Contact

Source*:* Created by Author (2019)

Table 2. Classification Example of Sentiment Analysis

Tweet	Sentiment
It's been twice the pegipegi, the promo is really ok	Positive
@pegipegi I'm confused, min, use the application	Negative

Source*:* Created by Author (2019)

RESULTS AND DISCUSSION

The performance of classification analysis using the Naïve Bayes Classifier is good and valid if the accuracy value is above 75%. In this research, the accuracy of Traveloka is 78,73%, Tiket.com is 78,01%, and Pegipegi is 81,40%. So, it indicates that the data is classified correctly.

The data is classified into seven dimensions of electronic service quality. Furthermore, it is classified into positive and negative sentiment class to get a deeper analysis. The proportion of sentiment class for each dimension as seen in Table 3.

Table 3. Sentiment Proportion of Service Quality Dimensions

Dimension	Traveloka		Tiket.com		Pegipegi	
	Positive	Negative	Positive	Negative	Positive	Negative
Efficiency	70 (45%)	86 (55%)	47 (71%)	19 (29%)	38 (83%)	8 (17%)
Fulfillment	933 (72%)	358 (28%)	708 (62%)	440 (38%)	433 (73%)	158 (27%)
System availability	24 (8%)	281 (92%)	26 (30%)	61 (70%)	11 (11%)	86 (89%)
Privacy	11 (39%)	17 (61%)	10 (23%)	34 (77%)	1 (14%)	6 (86%)
Responsiveness	83 (37%)	143 (63%)	100 (40%)	153 (60%)	74 (31%)	168 (69%)
Compensation	3 (33%)	6 (67%)	11 (48%)	12 (52%)	6 (46%)	7 (54%)
Contact	2 (33%)	4 (67%)	7 (64%)	4 (36%)	8 (67%)	4 (33%)

Source*:* Created by Author (2019)

Based on Table 3, it can be seen that the efficiency dimension on Traveloka has more negative sentiment compared to the positive one. It indicates that Traveloka has not provided the easiness for the customers. This is caused by the customers who feel confused in the refund process since Traveloka has three refund policies such as refundable, partially refundable, and non-refundable. Tiket.com has a more positive sentiment than the negative one on efficiency dimension because the customers feel that Tiket.com has been able to provide the ease of transportation and accommodation reservation transactions and refund proffering. The performance of the efficiency dimension at Pegipegi is already good with a very large percentage of positive sentiment that it has. This provides the information that Pegipegi as an OTA service provider has given the easiness for the customers.

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Regarding accomplishing service promises on the fulfillment dimensions, it can be assumed that Traveloka has a good performance on this dimension. If viewed from the customers' opinions, it caused the customers are satisfied with the discount promo given for flight ticket reservations, hotel room reservations, tour tickets, and vouchers for eating at the restaurant. The fulfillment dimension at Tiket.com is dominated by the positive sentiment than the negative one because Tiket.com provides discounts for airplane ticket purchases. Besides, tiket.com also provides free hot meals and vouchers Rp150.000 for aircraft or hotels for the customers who reserve Citilink airline. Pegipegi also has a more positive sentiment than the negative one in the fulfillment dimension. Based on a review of customer opinions, Pegipegi has fulfilled transportation needs, given the discounts, and provided complete information.

The performance of the system availability dimension at Traveloka is weak. It is due to the customers who complaints a lot about the server downs, force-closed application, and payment error. These problems causing the application and web to be inaccessible. Tiket.com also does not have a good system. Negative sentiment is more dominating since the loading is consuming more time, the features in the mobile application are error, and the application is not capable to make new reservations. System availability at Pegipegi also still needs to be improved because many customers complain about system errors and slow. The system failure of the three OTA is more common, especially when there are massive discounts.

The privacy dimension of Traveloka is dominated by negative sentiment. Customers assume that Traveloka's security in protecting customer information is weak. It is shown by the customers who complain that the pay later feature provided by Traveloka is misused and some of them are getting notification of failed login attempts to their Traveloka's account. Tiket.com has more negative sentiments on the privacy dimension since the customers find that their account has been hacked. It is proven by the existence of login alerts and successful transactions while the account owner does not feel that they have done any transactions. The performance of the privacy dimension at Pegipegi is also not good enough. Some customers are notified of booking tickets through their account, while the customer is not conducting any transactions at Pegipegi.

Regarding the performance of the responsiveness dimension, customers feel Traveloka is less responsive in responding and resolving customers' problems such as refunds or ticket rescheduling. So the responsiveness dimension at Traveloka has a greater percentage of negative sentiments. Tiket.com also has more negative sentiment. It represents by the customers who feel that the customer service does not respond to customer complaints and not master the information services. The percentage of negative sentiment on the responsiveness dimension of Pegipegi is also high. It indicates that Pegipegi has a low performance of the responsiveness dimension because the response provided by the customer service and the problem solving is quite long.

The compensation dimension at Traveloka is dominated by negative sentiment. It shows that Traveloka has a weak performance in providing compensation for service system failures experienced by the customers. Tiket.com has a more negative sentiment than the positive one. It indicates that the compensation dimension at Tiket.com is not good enough. As evidence, some customers do not receive any compensation for the failure of the Tiket.com service system. The performance of the compensation dimension at Pegipegi is the same as the other OTAs due to the customers

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who do not receive any compensation for the failure of the Pegipegi system.

Related to the existence of representatives who can be contacted online, Traveloka has a call center contact for the customers but does not have a call center contact of their work partners, thus the contact dimension at Traveloka tends to have the negative sentiment. Meanwhile, Tiket.com has more positive sentiments on the contact dimensions, because Tiket.com lists the call center contact, WhatsApp number, and email address on the website and its application. Positive sentiment that dominates the contact dimension on Pegipegi indicates that Pegipegi has a call center contact and email address that can be contacted to deliver questions or complaints.

CONCLUSION

Based on the multiclass classification of service quality, overall Traveloka's service quality is not good enough. Although the fulfillment dimension tends to have positive sentiment, it does not indicate that Traveloka's service quality is good enough. Because the other six dimensions of service quality such as efficiency, system availability, privacy, responsiveness, compensation, and contact have a more negative sentiment. So, the performance of these dimensions needs to be evaluated and improved. While the service quality at Tiket.com and Pegipegi is quite good, because the service quality dimensions which consist of efficiency, fulfillment, and contact dimensions tend to get a positive sentiment. However, Tiket.com and Pegipegi still need to increase their services by improving the performance of system availability, privacy, responsiveness, and compensation dimensions.

For further research, the researcher can apply a multiclass classification method and use user opinions on social media to identify the strengths and weaknesses of the company performance. The service quality dimensions used may differ because it must be adapted to the research object. Besides using the Naïve Bayes Classifier model, the researchers can use the Support Vector Machine or K-Nearest Neighbor model to classify the text data.

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