

# Monitoring Social Media with Social Network Analysis Method and Text Network Analysis as Business Intelligence

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## Abstract:

The progression of social figuring on huge information investigation make simplicity of doing examination on different parts of information mining through web-based social networking. One viewpoint which can be investigated through social processing is online business. This exploration will concentrate on the relationship of shopper impression of administrations given by web based business Lazada and Tokopedia in Indonesia. The research data obtained by crawling data on social media such as Facebook and Twitter. Social computing analysis method is use for Text Network Analysis. With Text Network Analysis, we can see the prevailing words are framing the systems and the affiliation words. It shapes the shopper's impression of services which given by internet business. The advantages of this investigation is the utilization of social computing in analyzing the e commerce customer for increasing the image of ecommerce by the customer perception in social media.

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## I. INTRODUCTION

Like businesses, e-commerce needs social media to know which user groups are being targeted, user perceptions, and competitor analysis. Along with the number of Internet users and social media in Indonesia, the amount of data or content generated by User Generated Content (UGC) users is also increasing. Various types of data generated by this social network continues to grow rapidly can be utilized to know the ranks of social strategies and strategies in social media, and consumer perceptions are analyzed through text networks.

One way to look at the perceptions of e-commerce users is through customer opinion in social media with text-network analysis. Quoted from an article written in an online magazine [1], a study conducted in Indonesia shows that there are only 21% of companies that develop and implement

social media strategies. On the other hand, there are only 13% of companies with comprehensive social media, as well as 38% of companies monitoring developments and conversations in social media.

Customer relationship and customer relationship management analysis can be done by using social network analysis. In his book, Pinheiro states that social networking is basically a collection of dots (nodes) connected to one or more links showing different types of connections on the network [2]. Social networks also provide valuable information about the class of actors in which each class can refer users with similar behaviors to have similar preferences or properties so we can connect the paths within a social network to predict the user class [3]. By using the characteristics of social networks, top

brands and user classifications can be known.

In social media, users are free to express their opinions, including expressing their opinions about the products or services of certain companies in social media, which will be visible to other users. On the other hand, current users are always looking for information about the products or services they will buy or use, and they are not just asking for someone's opinion [4], but they will also seek information from the internet, including social media.

APJII Data in 2017, mentioned that Indonesia social media user are almost 87,13% from Internet user or around 124,82 million [5]. Majority they are use Facebook and Twitter. Indonesia ranks fourth with the world's most active users of 106 million [6] and is ranked fifth with most Twitter users are 24,34 million active users [7]. Therefore, researchers use data taken from Facebook and Twitter.

A study needs to be done to monitor social media on e-commerce development in Indonesia. A case study on Lazada and Tokopedia was conducted to assist companies in determining business strategy and analyzing competitors about e-commerce.

## II. CUSTOMER FEEDBACK ON E-COMMERCE

Increased development of information technology requires companies continue to innovate to improve customers. The use of information technology is not only related to product innovation, but also the company needs to know the customer perception. Companies can use social media as a supporter of technology to improve interaction and virtual relationships with customers [6].

To compete in e-commerce business in Indonesia, company analysis is required by using internet technology currently developing in Indonesia. The results of monitoring can be done by the company about the circulation of customer perception in the virtual world, social

customer relationship management and brand analysis against competitors.

Appropriate methods are needed to monitor social media about e-commerce companies to generate business intelligence that companies can use to run their business. Therefore, this research entitled Monitoring Social Media with Social Network Analysis Method and Text Network Analysis as Business Intelligence (Case Study: Lazada and Tokopedia).

## III. CRAWLING CUSTOMER FEEDBACK ON SOCIAL MEDIA

In this study, data is crawling from social media Facebook and Twitter. Using Information from social media are for easier to crawling data and undirected excavations so we can crawl widely. Information that are crawling from facebook and twitter is about customer experience opinion when they use of E-commerce in Indonesia. After data crawling, the next step is preprocessing of data to get the valid data prior with the association process. We crawl 3875 comments from Facebook and 987 Tweets from Twitter about E-commerce Lazada, and 2999 comments from facebook and 875 Tweets from Twitter for E-commerce Tokopedia.

Table 1: Number of Comments in Facebook and Tweets in Twitter

Social Media	Lazada	Tokopedia
Facebook	3875	2999
Twitter	987	875

The preprocessing have 3 stages: tokenization, separating stop words and stemming. At the tokenization stage is for encourage investigation of system relationship, via did the way toward explaining the sentence into words, or expressions. The following stage are sifting, stop words connected to clean the information of a code or words that are not valuable. At stemming stage the way toward cleaning a prefix, postfix, infix, and



Layanan (Service)	38	2.54%
Masalah (Trouble)	31	2.07%
Bagus (Good)	27	1.80%
Pengembalian (Return)	15	1%
Pengiriman (Delivery)	11	0.73%
Komplain (Complain)	9	0.60%
Payah (Difficult)	9	0.60%
Lama (Long-Time)	9	0.60%
Harga (Price)	8	0.53%
Murah (Cheap)	7	0.47%
Lupa (Forget)	7	0.47%
Berhasil (Successful)	5	0.33%
Mudah (Easy)	4	0.27%
Kecewa (Disappointed)	4	0.27%
Cepat (Quick)	3	0.20%
	Total	26,79%

#### IV. ASSOCIATION PERCEPTION WITH TEXT NETWORK ANALYSIS

Content is an extraordinary structure and which is one of the compilers of the data[9]. In this examination, we influence relationship between words that to have experienced a preprocessing stage. Affiliation technique is the Text Network Analysis. Content Network Analysis are depict different sorts of arrangement that enables the expert to separate systems of ideas and to recognize the "signifying" that is spoken to or encoded in them [10]. The outcome will be produces an example that can be broke down [11].

In this study will see the figure of association from consumer impression in the e-commerce service at the two biggest e-commerce in Indonesia, Lazada and Tokopedia. Customer comment data about

Lazada and Tokopedia in Facebook and Twitter after processing stage, then go to the next stage to make the figure of word associations that processed and analyzed the results. The next stage will be follow such as in figure 3.

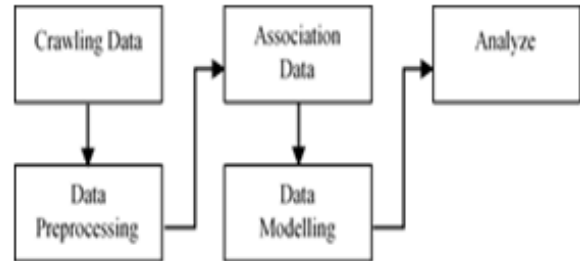


Figure 3: Step Association with Text Network

To get the word association the first stage is crawling consumer's comments from the social media, like Facebook and Tweeter, using text mining method to extracting information. The comments processed by divide each word in a comment. At data association stage, the words connected with another words that appears in one comment. After that at the modeling stage, in this study we are use the Gephi application to analyzed modularity and get the word association.

Modelling data from consumer impression are to get the positioning of e-commerce in the minds of consumers. The outcome text network will be describe the association every word through customer opinion on social media and describe consumer impression about E-commerce services.

Relationship from buyers observation will be clustered to get the buyers recognition. Each word that communicated by the customer in social media has the attributes, which can be separated into a few cluster dependent on closeness. The consequences of the relationship of buyer discernment is a rundown that related purchaser remarks which can be utilized as the organization's procedure to improve purchase, customer retention and brand image.

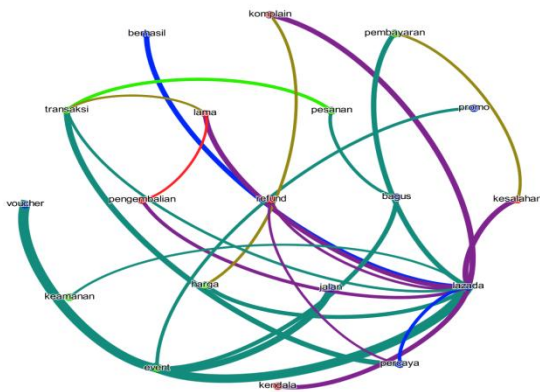


Figure 4: Text Network E-commerce Lazada

Table 4: Label of Text Network E-commerce Lazada

Cluster	Size	Label
Red	31.58%	Negative Perception
Blue	31.58%	Netral Perception
Green	36.84%	Positive Perception

The affiliation word from the content system about client recognition in Lazada can be find in Figure 4. In Table 4 clarify that the content system partitioned into a few groups, that are cluster red as much as 31.58%, a cluster blue as much as 31.58% and cluster green as much as 36.84%. Every cluster are named as per existing words that can be related to customer recognitions. The Red cluster is a negative recognition affiliation, the green cluster is sure observation affiliation and blue cluster about unbiased affiliation. Content Network Customer Perception on Lazada show great condition, in light of the fact that Lazada has increasingly positive (green) than the negative discernment (red) that can be summed up in the minds of customers Lazada.

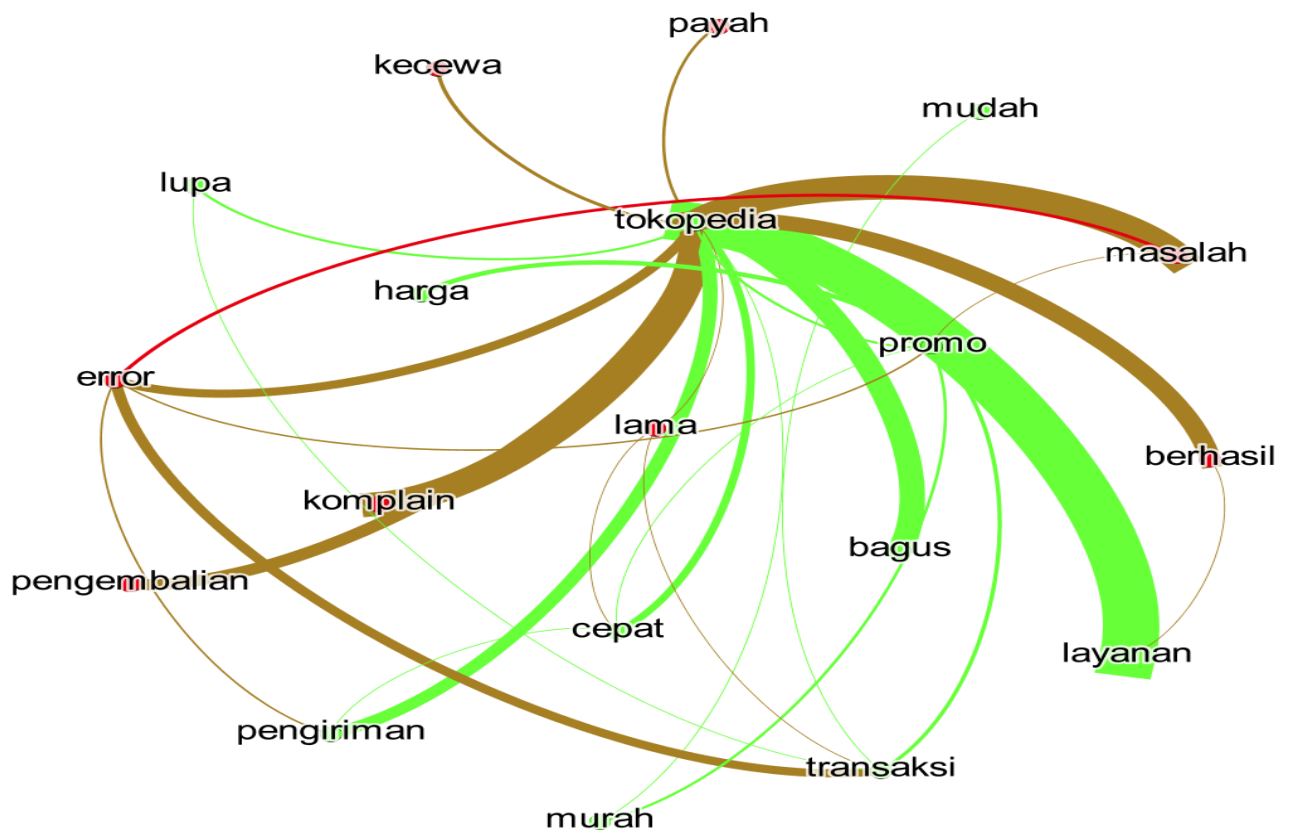





Figure 5: Text Network E-commerce Tokopedia

Table 5: Label of Text Network E-commerce Tokopedia

Cluster	Size	Label
 Red	47.37%	Negative Perception
 Brown	52.63%	Holiday Perception
 Green	0%	Positive Perception

The association word from the text network E-commerce Tokopedia customer's opinions can see in Figure 5. In Table 5 explain that text network divided into several clusters, that are brown cluster as much as 52.63%, red cluster as much as 47.37%, and green cluster as much as 0%. Red cluster is a negative perception association, the brown cluster about internet holiday perception and green cluster is positive perception association. Text Network Customer Perception on E-commerce Tokopedia has more holiday perception. So, Tokopedia E-commerce service has no positive perception in the minds of consumers.

From this study, we can see the similarity and difference consumer impression in e-commerce industry specialty for Lazada and Tokopedia. The result is product and dissatisfaction of the services similarity. The difference between Lazada and Tokopedia is from sentiments dominants, some have more positive sentiments than other, and so otherwise.

Companies can used the positive impression association to improve the company's brand image and the negative impression association can be used for improvement the services of e-commerce that provide by Lazada and Tokopedia.

## V. CONCLUSION

From this study we could have the model of customer perception from text analysis. By crawling the data through social media, we can use the customer opinion that are related to E-commerce. The result from text network analysis give the majority word that influence consumer impression about E-commerce Lazada and Tokopedia. The result from word

associations can create clusters associated to each set of the word.

The conclusion is the perception of Lazada through a service that prioritizes customer satisfaction is well established through consumer perception associations either through text network analysis. Tokopedia has a impression of the holiday in the minds of consumers, and does not have a positive perception. It is important for Tokopedia to improve the service, because there is already a previous capital that was awarded Marketers by Markplus.

The advertiser will be simpler, less expensive, all the more ongoing and achieve a bigger territory to make a promoting research with system content investigation than some other techniques. The organizations can have a synopsis of the shopper's recognition from client remarks in social media. With following the popular supposition from social media, will give the preferences for the organization to upgrade the customer relationship management (CRM) and give the fast reaction for their clients. Affiliation recognition can be utilized as a source of perspective for decide the company procedure to improving purchases, customer relation, and brand image and to enhance negative image for improve consumer loyalty.

Proposals for further research are to investigate the observation by joining the two techniques for text network and social network. That research will give the relationship of impression and shopper attributes that can be utilized for the Social Customer Relationship Management (SCRM) Program.

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