Case Study of Cashless Transportation Analysis in Indonesia

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Abstract. This study was conducted to analyze cashless transportation implementation and its impact in Indonesia. This research applied a descriptive qualitative approach and then analyzed it based on sentiment analysis. The data used in this study were e-news data from Kompas.com, detik.com, and tempo.co related to cashless payment in the transportation sector in Indonesia. The result shows that cashless payment is implemented in land transportation, especially around the highway. Cashless transportation will positively impact the environment by reducing crime risk and tax avoidance while increasing the transparency and cleanliness report. However, suppose applicable regulations do not support this activity. Road users tend to refrain from using cashless transportation because they doubt their safety or cannot get used to them daily. We suggested that the related third party prepare the completed area with evenly distributed electrical energy, connection, infrastructure, security, and digital awareness and literacy to prevent damage. So, users will not hesitate to use cashless payments for transportation activities or daily needs.

Keywords: Cashless payment · sentiment analysis · transportation impact

1 Introduction

This trend is one of the positive impacts of limiting community activities outside the home and enforcing lockdowns, such as reducing emissions and Greenhouse Gas (GHG) and accelerating environmental recovery in specific areas such as ecotourism and marine tourism [1]. So, investment in the environment to support macro-national development in Indonesia is balanced from an environmental, economic, and social perspective and is something that must be done [2, 3]. Earley & Newman [4] and Hong et al. [5] stated that appropriate investments, such as in the digital sector through new global data collection and appropriate computing techniques to develop transportation, infrastructure, and environmentally friendly management would accelerate environmental recovery in the normal era, with a minimal financial burden, was needed [3, 6]. Many digitization strategies can be implemented, such as blended finance policy in the transportation sector, like cashless payment.

Cashless payment is the easiest blended finance to implement in the transportation sector in Indonesia because, since 2021, Indonesia has implemented fintech in various

sectors to support national economic resilience in the COVID-19 era. These conditions place Indonesia in 43rd place in the 2021 global fintech ecosystem category. Based on this background, the importance of implementing and collaborating on digitalization, transportation, and finance is known to counter negative impacts that may arise after Covid-19, such as the global recession in 2023 or other recessions similar to Covid-19 that may arise in the future [6]. This research was conducted to explore the implementation of a cashless economy in the transportation sector in Indonesia.

2   Research Method

This research applied a descriptive qualitative approach to understanding existing phenomena directly without manipulating the observed phenomena [1]. The data were secondary data obtained through the web scrapping method using "WebHarvy" from three online news platforms in Indonesia: Kompas.com, detik.com, and tempo.co, in March 2021–2022 using two keywords "non-tunai" (cashless) and "nirsentuh" (untact or contactless). Then, it was processed using "NVIVO 12 Pro" and analyzed based on the sentiment analysis concept.

Sentiment analysis identifies opinions or messages in data based on learning or categories applied to the analysis engine on the specified model, such as positive, negative, and neutral [2, 3, 7]. Analyzed data results were then processed into a word cloud, word tree, and treemaps to make them easier to describe [6]. This description explains the meaning, concept, definitions, characteristics, metaphor, symbol, and description related to cashless implementation in transportation activity in Indonesia.

3   Results and Discussion

Each news data processed through a sentiment-based coding process allow one review to be labeled into one sentiment only. That has been processed through the coding process and sentiment analysis. The total number of news used in this research was 215. Based on the sentiment analysis result, we found 79 (36.4%) news labeled as positive, 135 (62.79%) news labeled as negative, and 1 news (0.47%) labeled as neutral. Table 1 exhibits the results of the sentiment analysis.

Based on the analysis result, most of the cashless payments in transportation referred to highway payment, around 6.83%. There is another implementation of cashless payment in other transactions like air or water transportation. But the percentage was under

Table 1. The Results of the Sentiment Analysis

Parameters	Total	Percentage
Positive	79	36.74%
Negative	135	62.79%
Neutral	1	0.47%
Total	215	100%

1%, which means the user was less than land transportation users. Figure 1 shows the result of the positive labeled sentiment analysis. It shows big and small words, meaning the biggest words in the figure have the most effective positive impact on cashless activity in Indonesia and vice versa. Big word shows in figure was sistem (system), transaksi (transaction), pembayaran (payment), and non tunai (cashless payment). Their research stated that having an excellent cashless payment system affected user willingness to use cashless payment and increased the transaction. Because they hoped cashless payment would reduce crime risk, tax avoidance, and disease contamination risk while increasing the transparency and cleanliness report [8, 9].

There are a few advantages based on the environmental perspective: Reducing physical money made from trees and metal; Reducing e-money made from plastic that has five years of expired; Reducing congestion for 6 s for each car in and vehicle exhaust. Figure 2 shows the result of the negatively labeled sentiment analysis. It uses one keyword is, "peraturan" or law. Based on research, we found that the law was the biggest obstacle to cashless implementation in the transportation sector in Indonesia. Figure 2 also shows regulations already underlie cashless transaction implementation in transportation sectors. However, the actual implementation of the regulation and sanctions is still unclear. This unreadiness will unintentionally create law-violated users that cannot be punished. In the long term, this condition will reduce user interest in cashless payments and decrease cashless payment transactions [8]. Many people avoid incomplete technology because they do not feel confident in using it. Nevertheless, this condition also happens vice versa; if there are too many restrictions on technology, people also tend to avoid using them because they feel they cannot get used to them in daily life [10]. In this case, the third party: the government, Jasa Raharja, and vendors, must complete the regulation to ensure legitimacy and reduce uncertainty.
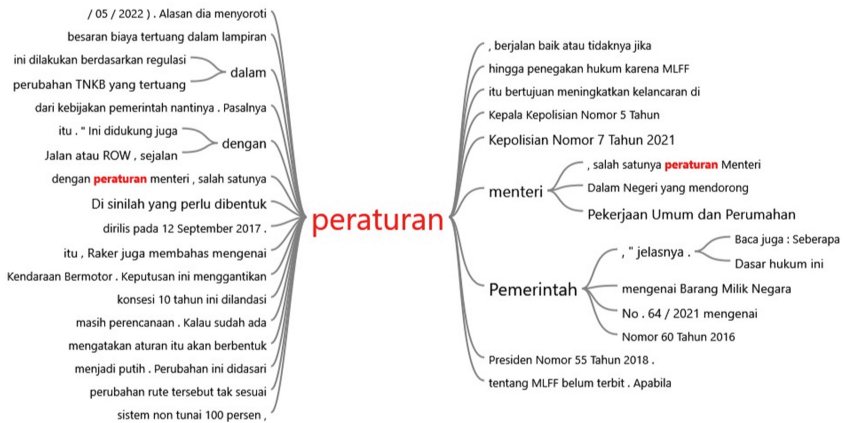

Fig. 1. Positive Word Cloud

Fig. 2. Negative Word Tree

4 Conclusion

This research proposed big data from e-news and sentiment analysis to analyze cashless transportation implementation in Indonesia. Based on the analysis results, we found positive and negative aspects of cashless performance. The positive one was that cashless transportation would reduce crime risk and tax avoidance, increase the transparency and cleanliness report, and positively impact the environment. However, suppose applicable regulations do not support this activity. Road users tend to refrain from using cashless transportation because they doubt their safety or cannot get used to them daily. We suggested that the related third party prepare the completed area with evenly distributed electrical energy, connection, infrastructure, security, and digital awareness and literacy to prevent damage. This research limitation was that there is only 1 news categorized as Neutral because of the lack of data. The neutral label cannot be validated as the trialability in that label was not reached. By obtaining more data, we believe there are more data on the neutral label, and the result can be obtained to get a new perspective. We also give some suggestions for future research to increase the data quantity.

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