

Research Article

Malaysians' perspectives on solid waste management and e-Waze as an online waste reporting system

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Abstract: Due to Malaysia's population growth, solid waste production has grown, with each individual producing 1.17 kg of rubbish daily and Malaysia producing an estimated 39,000 tons of garbage daily. The trash produced by households, industry, and trade increases in volume and becomes a key problem if not properly managed. Municipalities or governments must spend more on waste management if it is inefficient need. Nowadays, individuals rely more on their phones for daily chores. A strategy of using mobile apps known as e-Waze is proposed to support the existing waste management system. e-Waze's primary goal is to enable the public to direct lodging complaints with local authorities regarding waste complaints. To propose a new strategy for enhancing the waste management system to the public, it is necessary to investigate the public's acceptance of the proposed strategy. Therefore, a set of questionnaires has been prepared and delivered to Malaysian via WhatsApp to obtain their opinion on the solid waste management system and their willingness to report improper waste management through the online system. The questionnaire was designed structured style, with both closed and open-ended questions. This survey was conducted using a convenient sampling approach from February 25 until March 19, 2022. As a result, 100 respondents expressed dissatisfaction with their residential area's cleanliness. The respondents reported odours, rats, insects, and rubbish scattered around certain areas. In addition, 277 respondents agreed to use online platforms such as the e-Waze apps to report their waste complaints. Overall, using online technologies such as the e-Waze apps has the potential to be adopted by the public in facilitating the community to sustain the environment effectively.

Keywords: Mobile Application; Recycling; Solid Waste Management; Sustainability; Technology.



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1. INTRODUCTION

Today, we are witnessing tremendous technological advancement, with people becoming increasingly dependent on their mobile phones for daily tasks such as reading, shopping, learning, and venting. According to a recent report from the International Solid Waste Association (ISWA),

technologies such as big data, artificial intelligence (AI), automation, and the internet of things (IoT), which are all at the heart of the industry 4.0 revolution (IR 4.0), have the potential to improve waste management significantly. The IR 4.0 offers new opportunities to prevent, reduce, and even eliminate waste in certain sectors and streams, expand resource recovery, reach high treatment and disposal standards, and drastically decrease for pollution (Malinauskaite *et al.* 2017).

Managing waste is a global problem that affects everyone. Malaysia's solid waste management system falls short of worldwide norms, as indicated by the country's rapid economic expansion. Due to population expansion in Malaysia, solid waste output has increased, with one person generating 1.17 kg of garbage per day and Malaysia generating an estimated 39,000 tonnes of waste per day, all of which must be appropriately managed. Municipal solid trash is not only an environmental issue also a financial drain on the local government. To ensure the environment's long-term viability, proper waste management is essential. As a result, of establishing an efficient waste management system is required for sustainability. When planning for these activities, it is vital to strike a balance between manufacturing, transportation, land use, urban growth and development, and public health.

Based on the issues identified in the Malaysian community, Marvel Enterprise has proposed a revolutionary concept and approach that aligns with current technology, demands, and trends, capable of managing and utilizing trash through a mobile app known as e-Waze. E-Waze is a platform that combines the features of education and entrepreneurship in a single package. The primary focus of this proposed app is to give the public opportunity to submit complaints to the local authority directly. Besides that, e-Waze is expected to support Malaysia's infrastructure development efforts by leveraging digital solutions and technology.

Then again, it is essential to investigate the Malaysian's perception of solid waste management and their readiness to adopt a new strategy, such as using mobile apps to manage solid waste. Therefore, the following part explains the material and methods, results, discussion, and conclusion.

2. METHODS & MATERIALS

Collecting information from a random group of people by asking them questions is known as survey research (Check and Schutt, 2012). This study employed a survey research approach in which participants self-administered the questionnaire online. The questionnaire was distributed via WhatsApp from February 25 until March 19, 2022. The questionnaire used in this study consists of two-section. Section 1 was designed to obtain demographic information. Section 2 was designed to collect data on respondents' attitudes, awareness, satisfaction with solid waste management services, and acceptance of innovative waste management strategies such as e-Waze. The questionnaire was designed both in Malay and English to give more opportunities for Malaysians to participate in this survey. In the end, a total of 312 respondents participated in this study. Based on the data screening, 309 responses were suitable for further investigation. The data analysis was conducted using the Microsoft Excel application.

3. RESULTS AND DISCUSSION

3.1 Demographic Information

The total number of respondents who participated in this survey was 309 people from all over Malaysia (41% male, 59% female). The respondents of this study ranged from 18 to 51 years old from various ethnic backgrounds, including the major race groups of Malay, Chinese, and Indian.

3.2 *Environmental Perception, Attitude and Satisfaction Among Respondents.*

The perceptions of Malaysians regarding the quality of their living environment are depicted in Figure 1. As a result, 186 respondents (60%) agreed that they live in a clean environment. Meanwhile, one-third of the respondents (100, 32%) stated that they needed clarification as to whether or not they lived in a clean environment. There 23 respondents, who represented 8% of the total, claimed that they do not live in a clean environment in Malaysia. Therefore, the issue of residential cleanliness should be continuously highlighted by Malaysians. Cleanliness is of the utmost importance when it pertains to human health. However, the cleanliness of the residential area is influenced by various factors, including waste management services, street cleanliness, access road, drainage condition, and residential location (Owoicho and A Audu, 2019). Therefore, additional research of this depth ought to be carried out in the future to indicate the level of cleanliness in residential areas.

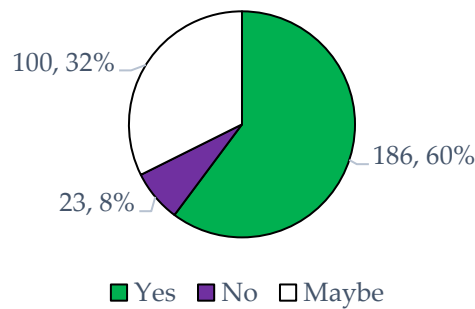


Figure 1. The Respondents' Perceptions of Living in a Clean Environment (n=309)

Figure 2 shows that more than half of respondents (169, 55%) occasionally recycle. One hundred two respondents (33%) agreed to recycle. On the other hand, 38 of the respondents (12%) stated that they do not recycle at all. Creating a clean environment is related to a recycling attitude (Ezeah and Roberts, 2012; Jekria and Daud, 2016). The findings of this study show that most Malaysian have practiced recycling. Therefore, residents of Malaysia should make a concerted effort to sustain their commitment to recycling. Recycling is not only conducive to residential cleanliness but has a positive effect on the environment and indirectly contributes to reducing the greenhouse effect, global warming, and flood catastrophes (Yaacob et al., 2022). In addition, individuals to generate income through recycling (Lamma, 2021).

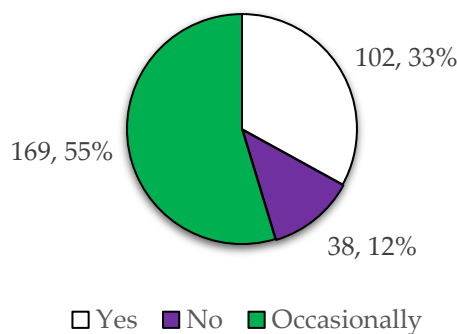


Figure 2. Respondents' Attitudes Toward Recycling

Figure 3 illustrates the satisfaction rate among Malaysian with waste management services. Only 116 respondents, or 37%, were satisfied with waste management services. Furthermore, 31% of respondents (96) are not satisfied with services, while 32% (102) respondent stated don't know about

satisfaction with solid waste management services. In a previous study that was carried out in Kelantan, Malaysia, it was found that the majority of respondents were willing to pay more for improved solid waste management to receive an improvement in the quality of these services (Abas *et al.*, 2021).

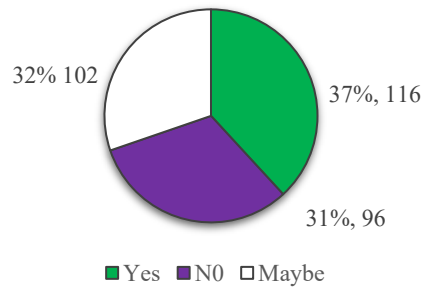


Figure 3. Satisfaction Among Malaysian Towards Solid Waste Management Services

3.2.2 Acceptance of New Strategies of Complaining Method Toward Solid Waste Management

The use of technology in enhancing solid management services has been an emphasis in prior research. For instance, a web-based solid waste management system has been introduced in Sierra Leone in 2019 is to promote a sustainable waste management system (Kayleemasa, 2018). Figure 4 reveals that out of 309 responses, 90% of respondents (277) agreed to use the e-Waze app as one of the strategies for improving the current solid waste management services in Malaysia. 8% of respondents (25) are considering using e-Waze, whereas 2% of respondents (7) are not planning to utilize the E-Waze application. As a result of these findings, it is possible to conclude that the e-Waze application is well-accepted in the community.

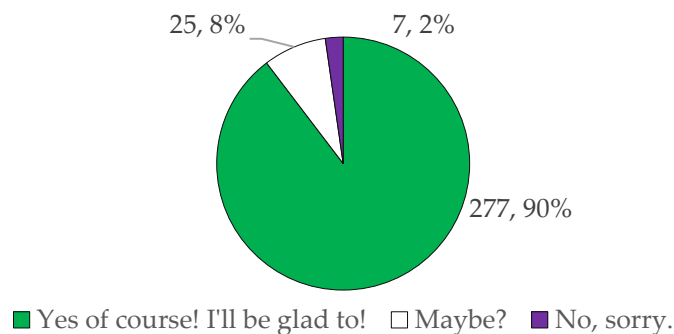


Figure 4. The Percentage of Acceptance of New Strategies of Solid Waste Management via e-Waze

4. CONCLUSION

The study's findings also contribute to a better understanding of Malaysia's present municipal and construction waste management methods. At the same time, and recognizing the challenges to incorporating sustainability into waste management can aid in developing technology to reduce the amount of trash generated during the pursuit of sustainability. E-Waze is one of the initiatives aimed at resolving the problem of trash management. To improve the waste management system, all waste management practitioners must work together and use the most appropriate strategy or technology to

ensure the long-term sustainability of the waste management system. Overall, all industries must adopt a sustainable waste management method to maintain a long-term sustainable future. As a result, the purpose of this research is to better understand Malaysia's present waste management techniques and gain the obstacles associated with achieving sustainability. Understanding the current challenges that our folks are facing, we can bring about a sea change in Malaysia's waste management by enhancing existing waste management technology in a more sustainable and effective manner.

Acknowledgments: The authors would like to acknowledge all respondents for their willingness to participate in this research.

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