Digitalization in Managing Waste through the Pasti Angkut Digital Platform

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Abstract. Waste management must be considered seriously. Poor waste management has the potential to amplify the negative impact on society. The adverse effects on health can result in infectious diseases. Furthermore, garbage makes the environment unattractive and uncomfortable, and it can even create disasters such as floods. This study was conducted in Panggungharjo Village, Sewon, Bantul, Indonesia. It was carried out by having observations and interviews with the community regarding household waste management. Due to advances in technology, waste management has been updated using the “Pasti Angkut” digital platform. The obstacle faced was that only some of the residents could use digital platforms. Hence, well-managed socialization and assistance were needed so that digital waste management could be implemented properly. The stages of socialization to implement the use of digital, the solutions to the problems faced by the community, and future challenges in digital waste management platforms are discussed in this article.

Keywords: Digitalization, Waste Management, Digital Platform, Sorting House, Pasti Angkut.

1 Introduction

Waste management has been an interesting discussion of all time because waste always increases in line with population growth [1]. Waste is important to be managed properly. Some people think the most important thing in dealing with garbage is not to pile it up at home. This raises several ideas for handling it. Garbage is material wasted or disposed of from human activities and it is natural processes that are produced every day. The more activities humans do, the more waste is produced. Improper waste management can increase the negative impact on society. One of the impacts that arise is affecting health which can cause infectious diseases [2, 3]. Additionally, waste can harm the ecosystem, spoil the view, and cause natural disasters such as floods.

Waste management issues include [4]: a lack of policies/strategies and financial support, a lack of private sector involvement, inefficiency, and poor public awareness. All of them lead to low levels of waste management services. The problems arise throughout the whole waste management process, including storing, collecting, transferring, transporting, and processing which tend to be worsened at the end (Final Disposal Site). On the other hand, the

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The majority of Indonesians cannot access proper land to manage their household waste well. When garbage was first managed, it was simply dumped in nearby areas, which led to complaints of an unpleasant odor caused by waste decomposition and a polluted environment [5]. Because of that situation, the community began garbage management and cooperated with outside parties. In this regard, each head of the family is burdened with a waste retribution fee. Garbage is moved from the house to the landfill by a third party.

In 2014, Pangguharjo Village, Sewon Bantul, Indonesia won an award as the best village at the national level for the waste management innovation category. Hence, the Waste Management Business Group (KUPAS) was formed. By having KUPAS, the community stopped working with third parties and started joining the KUPAS program. This new program requires residents to contribute IDR 20,000-25,000 depending on the number of family members/businesses. After acquiring more information about waste management, the people of Janganan Panggungharjo Sewon Bantul took the initiative to manage inorganic waste and goods having economic value such as paper, plastic, iron, etc. The waste management program at Janganan Panggungharjo Sewon Bantul is called “Sedekah Sampah, Sido Piknik”.

The “Sedekah Sampah” program has the motto “Waste management makes a lovely environment. Turn trash into cash, then happiness will last”. In the “Sedekah Sampah” program, people collect the wastes (paper, plastic, bottles, iron, used cooking oil) individually and then sell them collectively. The profits are used for community interests/activities such as buying a communal gas stove, savings and loans, and conducting recreational activities. The implementation of this temporary waste sorting activity is still carried out in front of the patrol post periodically, once a month, which is held every 2nd week.

1.1 The concept of Reduce, Reuse, and Recycle

The concept of reduce, reuse, and recycle (the Three Rs) will help explain how to manage domestic garbage or waste. It is a term for achieving environmental friendliness in waste management through a more holistic strategy [6]. Reduce is interpreted as purchasing only what is required. Not creating waste is better than reducing it. One of the most important waste management methods is to reduce the amount purchased. The idea is to buy only what you need in sufficient quantities. Everyone contributes to the waste management challenge. This will work if each home reduces its waste. It may be begun by determining which goods are required at home and which should be discarded.

Reuse is someone's activity trying to use used goods, or getting substitutes. The reuse process begins with the assumption that the used materials around us can become resources, instead of waste. Waste will always be in the eye of the beholder. One person's trash is another person's treasure. By taking a closer look, people can learn to see that waste materials can be reused to solve everyday problems and meet daily needs. However, most of the society has not even begun to utilize the resources in the waste. Brainstorming and developing ideas will help to decide how to utilize the waste for good use. Reusing used objects saves money and resources while satisfying the human desire to be creative.

Recycling is an activity of finding a way to recycle waste rather than throwing it away. Recycling will stimulate industrial activity, as recycling activities will enhance the quantity of materials produced. Manufacturing facilities will spring up to take advantage of this repurposed material. The more recycling plants that are created, the more products that will be produced, resulting in a greater understanding of the entire process. Recycling has the potential to generate employment. Some towns have built work partnerships with disabled workshops, developed and managed job training partnerships, or found employment for the unemployed workers in recycling initiatives.
1.2 Digitalization of Waste Management

Digitalization relates to the use of digital technology to deliver new value of creation and revenue opportunities [7] and usually goes hand in hand with adopting a service strategy. Waste management has adapted to employing digital services in the millennial era. Communities in the Panggungharjo sub-district area starting in October 2022 are partnering with "Pasti Angkut", which is a digital product service from the village government of Panggungharjo Sewon Bantul, Indonesia. The community was introduced to waste management with digital services [8, 13]. Therefore, Panggungharjo residents had to adapt to the times by paying a waste fee through a digital platform. Every customer must have an Android to download the Pasti Angkut application. Every customer in his house has a barcode attached.

Figure. 1. Caption of the Pasti Angkut Logo

Dissemination of waste management, protection of the environment, and the use of Android were intensively carried out. Residents must sort their waste at home. The waste that is disposed of is divided into 2 categories, namely organic and inorganic waste [9, 10]. Inorganic waste is divided into residual and scrap waste. The waste taken by "Pasti Angkut" is only organic waste and residue. Organic waste is transported free of charge provided that it is not mixed with other materials, for example, plastic. Apart from that, the community manages non-stick waste collectively for residents' activities.

The waste from the house is taken every two days. The officers on duty take pictures of the waste taken and weigh the residual waste. After the photo is uploaded by the officer, the customers can find out how much waste is disposed of and how much they need to pay by opening the Pasti Angkut application. Customers/citizens must be technologically literate and keep updated. Many problems were faced, but many benefits were obtained. After the 18th of each month, customers can see the amount of waste payments. If the customer has sorted the waste out properly, the customer will pay less. Another problem arising is that the customers should transfer the payments.

The problems of digitalization in a heterogeneous society are very diverse. Consequently, assistance is needed in using the Android for residents. Hopefully, as time goes by and the residents are aware, they will learn technology and create a clean environment. The institution will get significant income and advantages if the residents make payment at the institution and use digital services. Another issue is the storing of rubbish deposited by society referred to as Sorting Houses. Since this service program is an introductory support to create a Sorting House, the inhabitants of Janganan Panggungharjo do not yet have one.

2 Methodology

This study was conducted in several stages utilizing a qualitative method:
a. Observation. This activity was carried out by identifying waste management activities that were carried out by the Sedekah Sampah Sido Piknik agency.

b. Interview. The interviews were carried out by asking questions and discussing them with the waste manager. Some of the questions asked were: what are the operational procedures for waste management at Janganan Panggungharjo, both in terms of waste sources, the waste management process, and the socialization and implementation of waste management digitalization. In-depth discussions were held regarding cooperation and implementation of policies set by the Panggungharjo Village Government.

c. Digital platform implementation assistance. This activity was carried out by socializing and practicing a digital service platform, namely Pasti Angkut.

d. Sorting House Construction Project. During the activity of collecting waste that can be resold, the obstacle was not having a Sorting House. In the future, the Sorting House will be used as a proper and ready-to-sell waste storage area [12]. This is an economic aspect as a source of income for the residents of Janganan Panggungharjo, where the results can drive economic life, in the form of savings and credit and increase the welfare of the population through joint tourism.

3 Result and Discussion

Observations done in this study found that the Sedekah Sampah Sido Piknik institution is a community service related to waste management in Janganan Panggungharjo Sewon Bantul. It is structurally under the village administration. The executors of the activities consist of a group of people who have high social work motivation [11]. Social work motivation is attached to each individual with a high awareness to carry out this social work. Waste management operations won't continue if there are no individuals with a social service passion [15].

Some of the activities carried out are educating the public about the importance of waste management, sorting organic and inorganic waste in each household, receiving payments for garbage fees, receiving rotten waste, sorting residual waste, weighing waste, and selling rotted waste. Every year, profits from waste management are used to benefit the community's welfare and friendship by organizing joint tours. The value that may be gained is that the community has created a motive for social work by managing waste collectively and using the proceeds from waste management to improve relationships between people by traveling together.

In-depth interviews with the head of the waste management company were conducted. The head of the institution said that the waste management procedure began by instructing all residents to sort waste. This instruction was a follow-up to a policy from the Regional Government of Bantul Regency, and the Head of Panggungharjo Village, which stated that it was important to deal with waste from the household level, which is the source of the waste problem. Hence, sorting waste from its source is important. This policy aligns with Bantul's goal of eliminating waste by 2025. Bantul Regency is a district that initiated waste management with a digital platform called Pasti Angkut. This is due to the development of information technology and the emergence of the digital era. These are innovations that have substantial social benefits.
Figure. 2. Pasti Angkut vehicles for transporting waste

Figure. 3. Vehicles for transporting garbage in a residency

The socialization of digital services has been carried out by holding training from the digital platforms Pasti Angkut and KUPAS, appointed by the Head of Panggungharjo Village. This activity was held three times in the community activity forum. Socialization and assistance are important because they relate to the use of new ways of technological advances. The village government organized a young team to create Pasti Angkut. The system's continual improvement for the consumers' convenience was also explained. However, not all citizens can use digital services due to implementation issues. Future efforts must address several challenges, such as only a few of them are familiar with digital technology, there is a shortage of (old) digital equipment, and the citizens are not accustomed to e-banking/transfer operations.

In the future, improvement is needed in implementing reduce, reuse, and recycle. Community involvement provides mutual education in this implementation. In addition, the management of waste segregation requires a non-permanent place. The Sorting House is a non-permanent building that will be used to sort and store waste that can be sold. Waste that can and is ready to be sold is in the form of duplex/paper, cardboard, plastic, iron, and used cooking oil which is sorted according to the type.

4 Conclusion
Waste management is an important activity that is not only the responsibility of the government but requires community involvement and concern. Garbage has an economic value. If it is managed properly, a village can have the benefits. The 2025 Clean Garbage Bantul Program is a target for Panggungharjo village in which waste can be managed optimally. With the Pasti Angkut digital platforms, residents are introduced to waste management as well as payment technology. By subscribing to Pasti Angkut, customers know how much waste they dispose of and how much they have to pay. Technology facilitates the activities of citizens.

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**References**


