Cultivating Waste Bank Digital Applications in Pucangan, Kartasura, Sukoharjo

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ABSTRACT
A community-initiated waste bank has emerged in Pucangan Village, Kartasura, Sukoharjo, Central Java, Indonesia. It has become a significant contribution to the problem of waste management and a form of environmental concern. However, waste bank management still uses conventional methods. They have recorded, calculated, and reported manually. The condition can be a significant risk in management because it needs an automatic and integrated system between managers and waste bank customers. Therefore, the Sebelas Maret University partnership program team works with the community to create a digital application to help manage waste bank management digitally. Through the application of digital technology, the waste bank application can help the community manage waste bank management according to their needs. The design, manufacture, and practice of using the waste bank application ultimately involve the waste bank manager. Implementing this activity uses a participatory method; the service team actively participates directly in the target community group. So that it can encourage target groups to be able to identify, analyze, and map problems, potentials, and obstacles in waste bank management and be able to formulate joint solutions through the waste bank application: www.banksampahpucangan.com.

Keywords: *digital application, community partnership, participatory, waste bank*

1. INTRODUCTION

Pucangan Village, Kartasura, Sukoharjo, Central Java, Indonesia has 7 Waste Banks initiated by the government and non-governmental organizations, including Mugi Berkah Garbage Bank, Rizqi Berkah, Clean Awareness, UIN Pijar, Griker Pass, Grogolan Guitars.

The manager of the Jensan Waste Bank admitted that this activity provided benefits for residents in increasing knowledge about waste management and social and economic benefits. In terms of knowledge, a Waste Bank helps change how people view waste. Residents who usually throw their garbage in rivers and burn their household waste are now starting to practice sorting recyclable and non-recyclable waste. Socially, the Waste Bank is applicable as a medium for meeting residents and interacting and discussing their daily problems, especially regarding waste issues around them. Economically, the Garbage Bank is a medium for saving residents who can withdraw their money anytime when needed.

However, even though it has provided many benefits, several obstacles still need to be faced by this waste bank. According to Anna (founder of the Jensan Waste Bank), at least five problems still have to be resolved so that the Jensan Waste Bank becomes more optimal in empowering residents. The five problems include the lack of public awareness of waste management, lack of knowledge about the dangers of inorganic waste, the presence of plastic waste that waste collectors do not accept, limited waste bank activities, and manual recording processes. Referring to the problems of the Jensan Waste Bank as the target partner, the solutions that can be designed are as follows:

Table 1. Problem Analysis and Solution

No.	Partner Problems	Offered Solutions
1.	There is still a lack of public awareness of waste management	Socialization of the importance of community-based waste management in the community

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No.	Partner Problems	Offered Solutions
2.	Lack of knowledge about the dangers of inorganic waste	Socialization of the impact of inorganic waste on the living environment
3.	There is plastic waste that garbage collectors do not accept	Training on making creative products with raw materials from plastic waste that is difficult to decompose
4.	Waste bank activities are still limited.	Capacity building in innovative recycling waste management into creative products with economic value
5.	The process of recording waste bank management is still manual	Application of application as information system technology to integrate waste bank management

From these problems, the service team and the target partners determine the main priorities of the problems that need to be solved. The chosen problem's priority is applying a digital information system application to integrate data management between waste banks in Pucangan Village. In waste bank management, reasonable, orderly, and accountable records are needed to achieve the program's objectives and sustainability. An integrated information system can optimize efficiency in data management based on the opinion of Melchor & Carrilo [1]. For Anggraeni & Irviani, an integrated information system is designed and built to improve data accessibility quickly, precisely, and accurately [2].

2. LITERATURE REVIEW

Several waste banks have carried out the application of information systems in waste bank management in the regions (Yustanti, 2017; Handarkho, 2016; Marali, 2018; Widaningsih & Suheri, 2019) [3][4][5][6]. However, from previous studies, the management information system is still a web desktop. While the solution offered in this service is waste bank management based on mobile applications.

In addition, previous studies are still in the perspective of computer science. No sociological perspective is associated with applying information system technology in waste bank management. Putri [7] stated that the speed of digital technology has integrated into people's daily lives, which can have both negative and positive impacts. The interaction between society and digital technology (human-technology interaction) has resulted in changes in society, such as changes in communication patterns, interaction patterns, and transaction patterns. A sociological approach is needed in implementing new technology in society so that there is no gap in the program running. The speed of technology needs to get balanced with social conditions in the community for the sustainability of a program. Analysis of the condition of the waste bank in each region is undoubtedly needed in designing digital-based programs. So the application's output can vary according to the socio-cultural conditions of each region. In this case, the service team will accompany the Jensan Waste Bank to transform management from manual to digital.

The solution is also based on studies from the service team that has been carried out previously. The waste bank is an institution at the hamlet level based on environmental issues and economic solidarity. Solidarity has been formed based on ties and shared beliefs to manage waste for a better environment. If managed properly, waste banks can contribute to poverty alleviation through the opinions obtained from waste management [8]. Waste banks can also have the potential as an instrument of community resilience in the environmental sector and micro-scale economic resilience to Marsh [9].

Based on Yuyun Sunesti's study [8], there are challenges in managing waste banks, one of which is related to organizational and financial management. Organizationally, waste bank managers can only spare time on weekends. Manual management requires more energy than others, so the time required is also more compared to management carried out with the help of digital applications that can be coordinated and monitored at any time. In addition, from a financial perspective, waste bank management needs to be carried out professionally and is still manual recording. Therefore, these challenges can be overcome by providing service program solutions that can collaborate to help manage digital-based waste banks. The application of digital applications can help waste bank managers start by coordinating functions, financial management, and HR management more effectively and efficiently. This program can also contribute to developing a sustainable waste bank in the face of industry 4.0.

3. METHODS

Implementing this digital-based waste bank management service uses a participatory method; namely, the service team actively participates directly in the target community group. This participatory approach can encourage target groups to identify, analyze, and

map problems, potentials, threats, and obstacles in managing digital-based waste banks and formulate solutions.

The implementation of this community service activity is carried out through the following stages of implementation:

a) Awareness of the target group

b) Brainstorming and FGD discuss the target group's thoughts, views, and experiences.

c) Develop program plans and training modules for the target group

d) Program implementation

e) Workshops designed for target groups

f) The assistance of the target group

g) The Result of Evaluation on the implementation of service.

Figure 1 Program Implementation Method

4. RESULTS AND DISCUSSIONS

Activities that have been carried out through five stages of the program are (1) Initial discussion; (2) waste bank digital application planning; (3) creating a digital waste bank application, (4) training on the application of a waste bank digital application, and (5) evaluating the use of a waste bank digital application. In detail, the implementation of the application development program as an integrated system technology in digital-based waste bank management goes through the following stages:

a) Communication, namely the observation and FGD stages, with the Jensan waste bank manager. This stage is the first step to analysing the waste bank manager's need for an integrated information system. This process is needed to see the extent of the need for information system support needed in waste bank management.

b) Planning, namely the application design stage, will be made following the results of the needs analysis of the target group. This stage consists of analysing resources and funding and targeting the time required to make the waste bank management application.

c) Modelling is the stage of describing the waste bank information system that will be made, such as the application display design. In this case, the service team also collaborates with IT to design applications with the target group according to the needs of the waste bank manager.

d) Construction, namely the stages of making applications according to the needs of waste bank managers. Trials will also be carried out at this stage to see to what extent the application can help manage and evaluate programs that need to be improved so that the system can run more optimally.

e) Development, namely the stage of applying an integrated system technology to the waste bank manager for use in the management process. This process is also socialization for each waste bank division in supporting applications for waste bank management.

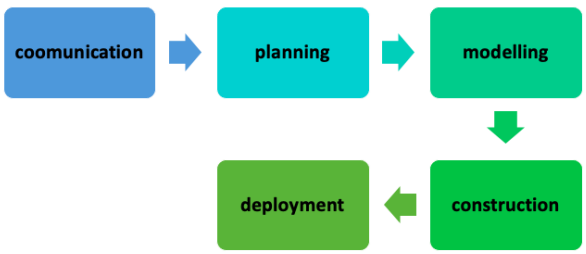

Figure 2 Program Stage

After going through a discussion and needs analysis process, a waste bank application was created named banksampahpucangan.com. This application can integrate data related to Pucangan waste bank management. This application can be operated on a laptop or mobile browser.

The Pucangan Waste Bank application can be accessed using a browser (Google Chrome, Mozilla, Opera, or others) via the link: https://banksampahpucangan.com/. On the start page, you will be directed to log in first by entering the username and password according to the account that has been registered, then click the Login button. Users who act as customers can register themselves through

the Waste Bank Admin to have a username and password.

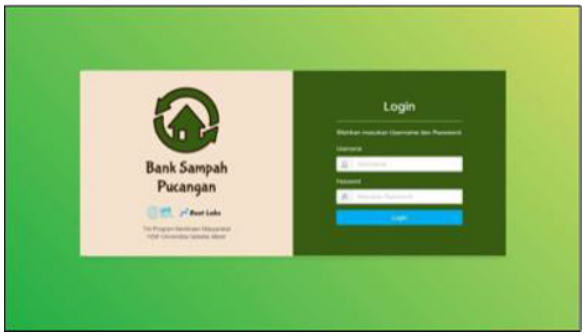

Figure 3. Application Page View

The Pucangan waste bank application has various menus and features that allow users to carry out managerial processes digitally. The following is a list of systems that can be accessed from the Digital Waste Bank Application according to user needs, namely:

a) Responsive website-based applications that can be accessed via desktop and mobile;

b) There are two types of accounts (Admin and Customer);

c) Customer can check the balance

d) Admin can do the following:

- Account Management (Add, Monitor, Update, Delete)
- Transaction Management (Add, Monitor, Update, Delete), including balance addition and balance deduction
- Category Management (Add, Monitor, Update, Delete) Print Reports by the customer, time, and category

The Admin Dashboard contains information about the total waste, total customer balance, and total customers contained in one Waste Bank. Moreover, on the right side, there are menus such as Customer Accounts, Categories, Transactions, Transaction Recap, Withdrawal, and Balance Recap.

Figure 4. Application Dashboard View

After the waste bank application has been launched, the next stage is socializing the use of the waste bank application. Application users are given a manual to make it easier to use the application. We provide assistance to waste bank managers to practice using the application. After that, the next stage is to evaluate the application design to determine whether it is following the needs.

Figure 5. Waste Bank Application Socialization Process

5. CONCLUSION

The Community Partnership Program activities in the form of development, socialization, and assistance in using the electronic financial administration system application generally went well. Through the system that has been developed, it can contribute to transforming the Krejengan Waste Bank into a digital-based form of management, which was previously done conventionally. The implementation has some obstacles, such as changing the habits of users who are already accustomed to conventional management. However, managers and customers are still trying to get used to it because the application can help the waste bank management process more effectively and efficiently.

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