

Smart Waste Manager Device for Waste Management

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ABSTRACT

The purpose of this study is to identify the effect of high-tech bins on people's interest in disposing trash. The method used in this study is a quantitative descriptive method and literature study to analyses community perceptions of smart trash bin. The results of this study state that the mind-set of the community in disposing trash increased after the existence of smart trash bin project. These results were obtained because the community became more interested in disposing trash in the presence of unique designs and diverse functions of these high-tech bins. This study concluded that smart trash bin can increase people's interest in disposing garbage in its place.

Keywords: Research Paper, Technical Writing, Science, Engineering and Technology

I. INTRODUCTION

Introduction At this present time, the condition of the people's mindset about disposing trash is fairly sad, especially in Indonesia. In fact, there are still many people who don't care about the environment, for example by littering in everywhere. This is based on two things. The first one is the condition of the garbage facility which is lacking in terms of quality and quantity, and the second one is the mindset of the people who still consider the most practical waste disposal by letting it lie on the roadside or dumped it into the river. Therefore, many researchers conducted research and writing on solutions to increase people's interest in disposing trash to the right place. One of them is by upgrading ordinary trash bin into trash bins with advanced technology called Smart Trash Bin as a form of effectiveness and efficiency in disposing and managing waste. One of the articles which discuss about the trash bin technology came

from Japanese authors, Fujii, Fujita, Ohnishi, Yamaguchi, Yong, and Park, which resulted in expenditures in the form of recycling bins (called smart recycling). Its technology reduces carbon dioxide emission and lower the overall costs [1]. The other finding about high-tech trash bin is the form of trash bin with a waste sorting from Sinha & Couderc [2], also there is similar research from Lee & Wu [3]. Both of these papers discussed about the technology of bins with a waste sorting system. Even Indonesian writers, Prengky, Bayu, Steven & Julyar wrote a similar paper about an intelligent automatic waste sorting tool that can separate metal and non-metal types of waste [4]. These findings are useful for optimizing waste collection and management. But the findings are still less of effective in attracting the public's interest in disposing garbage into the trash bin.

II. METHODS AND MATERIAL

The implementation of product design uses the Kaizen method, which is carrying out continuous improvement or continuous improvement [13]. Kaizen has four stages which are commonly abbreviated as PDCA or plan, do, check, action. This method is used because it helps the implementation to be simple and easy in application in real life. This method also allows for further product development in the future.

3.1 Plan

- Identification of problems

The implementation team identified problems in handling waste in the community by searching the library, there was an innovation in the trash can that notified the cleaning staff when it was full [14], then there was an automatic trash can that could open the trash can without touching it [15]. This has not been able to completely overcome the problems faced, especially in sorting the types of waste.

- Analysis Data

The implementation team processes and analyzes the data so that the proposed features of the product are obtained. From the results of the analysis, six needs were obtained, namely capacity, waste sorting sensor, product design, hand sanitizer features, convenience, and trash can cover.

- Product development process

After identifying the problem and analyzing the data, then the product design process is continued using the QFD method, namely by comparing the product to be designed with the previous product to get the best specifications of the product to be made, the following is the process:

- Identification of customer needs Table 1-6 are the results of identifying customer needs based on interviews with their level of (*importanceimportance*).

III. RESULTS AND DISCUSSION

4.1 Prototype

Prototyping of Smart Trash Can is done by creating a 3D design using the Solidworks application. The design of the prototype on the Smart Trash Can is carried out by considering the material, effectiveness, and working mechanism. The size of the tool is made as minimal as possible so that someone can be comfortable and easy when they want to dispose of garbage using the Smart Trash Can. Figure 2 is the prototype of Smart Trash Can. The prototype size used is 60 cm in diameter and 60 cm in height and is divided into 3 automatic containers that function to accommodate types of organic, inorganic, and metal waste. In the manufacture of the Smart Trash Can, a casing or body with iron material is used so that it can accommodate up to 15 kg of garbage.

Users can use the product by attaching waste to the sensor, then the LCD will show what type of waste was detected so as to provide education to the public about the types of waste so that people can dispose of waste according to the type of waste. Then one of the containers will open and the user can put trash in it. In addition, the Smart Trash Can prototype has a hand sanitizer feature that can be used to clean hands and also functions as self-protection from Covid-19. must be in 10 pt Italic. Email address must be in 9 pt Courier Regular font.

A. Figures and Tables

Place figures and tables at the places where they needed. All tables should be in Classic 1 format with borders to heading and subheading columns. Large figures and tables may span across both columns. To do so select text above one column table and convert it in two column and then select text below one column table and convert it into two column. Figure captions should be below the figures; table heads should appear above the tables. Insert figures and tables after they are cited in the text. Use the abbreviation "Fig. 1", even at the beginning of a

V. REFERENCES

sentence. We suggest that you use border for graphic (ideally 300 dpi), with all fonts embedded) and try to reduce the size of figure to be adjust in one column. Figure and Table Labels: Use 8 point Times New Roman for Figure and Table labels. Use words rather than symbols or abbreviations when writing Figure axis labels to avoid confusing the reader.

- [1]. https://www.youtube.com/watch?v=F6XndxIjR9A&ab_channel=SunRobotronicsTechnologies
- [2]. https://www.youtube.com/watch?v=JFt8l9Ei8Hw&ab_channel=SunRobotronicsTechnologies
- [3]. https://www.youtube.com/watch?v=1vqD-7vqDxI&ab_channel=BeautifulDreams
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- [5]. <https://electronicslovercom/2018/10/arduino-based-automated-waste-segregator-final-year-project.html>



Figure 1: A sample line graph using colours which contrast well both on screen and on a black-and-white hardcopy

IV. CONCLUSION

The Smart Trash Can has been created which is designed to increase public awareness and knowledge about environmentally sound waste management as an effort to support the global action plan for Sustainable Development Goals (SDGs). Smart Trash Can is a detector of organic, inorganic, and metal waste, as well as a hand sanitizer feature that is intended to make users care more about cleanliness after disposing of garbage, all of these features are controlled by Arduino Uno. Smart Trash Can has been tested 30 times on each feature and has good results because each feature is able to run well, so it is hoped that Smart Trash Can can be mass-produced and can be a solution to the waste problem in Indonesia.