

**SMART GARBAGE BIN WITH EMBEDDED GPS AND MIXED WASTE  
SCANNING SYSTEM: A PROTOTYPE**

**A Thesis Presented to the Faculty of the  
College of Communication and Information Technology  
President Ramon Magsaysay State University  
Castillejos, Zambales**

**In Partial Fulfilment of the Requirements for the Degree  
Bachelor of Science in Computer Science**

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
**June 2023**

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Castillejos, Zambales



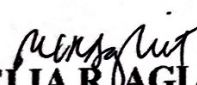
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
The thesis project entitled "**Smart Garbage Bin with Embedded GPS and Mixed Waste Scanning System: A Prototype**" was prepared and submitted by **John Lloyd M. Aggarao, Joel L. Corpus, Jr., Zhanra Angela M. Gonzales, and Allan V. Mina** in partial fulfillment of the course requirements for the degree of **Bachelor of Science in Computer Science** has been examined and recommended for the oral examination.

  
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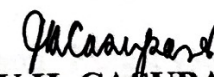
  
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Accepted and approved as a requirement for the degree of  
**BACHELOR OF SCIENCE IN COMPUTER SCIENCE.**

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## ABSTRACT

The researchers of this study developed a Smart Garbage Bin with Embedded GPS and Mixed Waste Scanning System to replace ordinary trash bins with labels that will be used in schools as a prototype device to help students check biodegradable and non – biodegradable wastes to reduce the mixing of garbage, locate the bins, and lessen the workload of the authorities collecting the garbage bins.

The purposive sampling technique was used by the researchers to identify the effectiveness and user acceptance of the respondents to the proposed device. The respondents of the study are students from San Guillermo National High School, San Marcelino, Zambales.

The questionnaires were based and patterned on the ISO 25010 software quality: performance efficiency, device accuracy, and functionality. The performance efficiency of the proposed prototype device and application was rated Good by the IT experts with a mean of 4.12 during the alpha testing and was rated Good by the student respondents with a mean of 3.95 during the beta testing through the conducted survey. During the alpha testing for the prototype's accuracy, the IT experts rated Excellent with a mean of 4.40 while for the beta testing conducted through a survey to student respondents, the prototype's accuracy was rated Excellent with a mean of 4.41. For the prototype's functionality, both the IT experts and student respondents rated Excellent with a mean of 4.64 during the alpha testing and 4.41 during the beta testing, respectively. In terms of performance efficiency, the prototype device was rated Good garnering a total weighted mean of 4.03, showing that the device is good when it comes to performing its function and completing tasks with fewer errors.