

**A STATISTICAL ANALYSIS ON THE FACTORS AFFECTING END
USER PERCEPTION TOWARDS IMPLEMENTATION OF A
MOBILE BASED GARBAGE MONITORING AND COLLECTION
SYSTEM IN MUNICIPAL COUNCILS**

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Master of Science in Business Statistics

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Dissertation submitted in partial fulfillment of the requirements for the
degree

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DECLARATION

I declare that this is my own work, and this Dissertation does not incorporate without acknowledgement any material previously submitted for a Degree or Diploma in any other University or Institute of higher learning and to the best of my knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgement is made in the text. I retain the right to use this content in whole or part in future works (such as articles or books).

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The above candidate has carried out research for the Name of the Degree Dissertation under my supervision. I confirm that the declaration made above by the student is true and correct.

Name of Supervisor: Dr. A.L.A.R.R.Thanuja

Signature of the Supervisor:

Date: 16.12.2023

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ABSTRACT

Generation of waste and thus management of waste has become a severe problem throughout the world, at it is rather applicable for Sri Lanka with a higher extent of poor waste management practices. In recent past Sri Lanka has faced many problems even including fatalities, consequential for not having a proper waste management system. The micro picture of this involves improper collection and monitoring of waste by the residential and commercial areas where people face many difficulties over waste management. As a solution, a mobile based garbage collection and monitoring system, which will become more convenient for the residents and municipals to use and manage their waste collection and monitoring can be proposed. The 3rd extension of the Technology Acceptance Model (TAM 3) is used to determine the dependent and independent variables as it illustrates the user behavior in adapting towards a technology. Progressing from the practical gap, primary objective of the study is to identify the determinants of end user perception towards implementation of a mobile based waste collection and monitoring system, adding the secondary objectives as: to identify any influence between the demographic variables and preference of using such a mobile based application for waste management and to seek the highest influential demographic factor. The study conducted focused on the Western Province and using multi-stage cluster sampling method; 487 valid responses were obtained, with an 86.21% response rate. The study consists of 11 independent variables with total of 16 dimensions with one dependent variable of preference over diffusing a mobile based waste collection and monitoring system. With the dimension reduction technique of principal component analysis and varimax, quartimax and equimax rotational methods, the independent variables were deduced in to six major factors: quality assurance, interference and appearance, work assistance, relative ease of use, subjective norms, and perception of external control. Proceeded, all demographic variables of gender, age, level of education, occupation and nature of resident has a significant influence on the overall preference over the mobile application where occupation being the highest influential demographic variable. Amongst the significant recommendations, simplicity, convenient, multilinguistic support, feedback, and report has been introduced.

Key words: Factor analysis, Mobile applications, Perception, Waste management.

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LIST OF ABBREVIATIONS

Abbreviation	Description
CA	Computer Anxiety
CSE	Computer self-efficacy
CP	Computer Playfulness
GIS	Geographic Information Syetms
IM	Image
JR	Job Relevance
NGO	Non-Governmental Organizations
OU	Objective Usability
PCA	Principal Component Analysis
PE	Perceived Enjoyment
PEOU	Perceived Ease of Use
PEC	Perception of external control
PQ	Perceived Quality
PU	Perceived Usefulness
RD	Result Demonstrability
SN	Subjective Norms
TAM	Technology Acceptance Model
VIF	Variance Inflation Factor