DESIGN AND DEVELOPMENT OF WATER REFILLING STATION OPERATIONS SYSTEM

Undergraduate Thesis
Submitted to the Faculty of the
College of Engineering and Information Technology
Cavite State University
Indang, Cavite

In partial fulfilment
of the requirements for the degree
Bachelor of Science in Industrial Engineering

RENIEL B. ARELLANO
JHORILYN G. PANGANIBAN
MYRA B. PAYABAN
December 2018

ABSTRACT

ARELLANO, RENIEL B., PANGANIBAN, JHORILYN G. and PAYABAN, MYRA B. Design and Development of Water Refilling Station Operations System. Bachelor of Science in Industrial Engineering. Cavite State University, Indang, Cavite. January 2018. Adviser: Dr. Willie C. Buclatin.

The demand at the water refilling stations – water stores that sell purified water is now increasing. The quality of purified water conforms to the national standards for drinking water and is even better than the quality of water produced by traditional water supply systems in terms of removed impurities. Structurally, water refilling station can be operated with a minimum area of at least 20-25sq.m. It comprises the following sections: refilling and selling room, enclosed water purification room, container washing and sanitizing room, storage room for empty and refilled. The study aimed to assess the design and development of water refilling station operations system.

This study aimed to assess the operations system of water refilling station. The primary sources of data were the owner of QualiPure Water Refilling Station, who invested, organized, put up and managed the business and their customers who benefited the operations system in terms of customer monitoring. Random sampling technique was used to determine the number of participants in the study. The total participants for the evaluation of the system were 71 customers including the owner of water refilling station.

The Define-Measure Analyze-Design-Verify (DMADV) approach was used in undertaking this study. Developmental research was used in the study and Define, Measure, Analyze, Design and Verify (DMADV) method was followed as its research methodology.

After identifying the current process and the problems encountered by the water refilling station, the researchers designed and developed the operations system using the gathered problems and different criteria. In terms of the quality and usability of the system, it yields a level of excellence from the respondents, and achieved the effectiveness, and efficiency of the operations system. This also gives a satisfaction level to the users.

After the evaluation, it was found out that the water refilling station operations system met and achieved the different criteria for the interaction between the user and the system. All the parts of the system yield an excellent and a good rating from the respondents. The following criteria were applied: (1) guidance; (2) system Interface; (3) user Control; (4) adaptability; (5) error management; (6) consistency; (7) significance of code; and (8) compatibility.

For further improvement of the Water Refilling Station Operations System, the researchers recommend to: (1) add more information on operations system to enhance the efficiency and effectively of system; (2) adaptations of bigger business industry wide range of accounts are needed; (3) add convenience and visual comfortable for the user of the system; and (4) add much more easy monitoring of daily sales report that can be printable.

TABLE OF CONTENTS

	Page
BIOGRAPHICAL DATA	ii
ACKNOWLEDGMENT	iii
ABSTRACT	v
LIST OF TABLES	x
LIST OF FIGURES	xiv
INTRODUCTION	1
Background of the Study	2
Statement of the Problem	3
Objectives of the Study	4
Significance of the Study	4
Scope and Limitation of the Study	5
Definition of Terms	5
Conceptual Framework of the Study	6
REVIEW OF RELATED LITERATURE	7
METHODOLOGY	28
Research Design	28
Research Method	28
Define Phase	29
Measure Phase	30
Analyze Phase	30

Design Phase..... 30

Verify Phase..... 30

Sources of Data..... 31

Participants of the Study..... 31

Sampling Technique..... 31

Data Gathering Procedures..... 32

Statistical Treatment of Data..... 32

RESULTS AND DISCUSSION..... 34

Define Phase..... 34

Selection of the Participants..... 34

A. Identification of the Current Situation..... 34

B. Problem identification..... 35

Measure Phase..... 37

Analyze Phase..... 39

Design Phase..... 48

Verify Phase..... 61

Evaluation of the Operations System Quality..... 62

A. Guide..... 62

B. System Interface..... 65

C. User Control..... 67

D. Adaptability..... 69

E. Error Management..... 71

F. Consistency..... 75

G. Significance of Codes..... 77

H. Compatibility..... 79

Usability of the Operations System for Interface of database guide..... 81

A. Effectiveness..... 81

B. Efficiency..... 84

C. Satisfaction..... 87

Technical Requirements Evaluation..... 90

Sustainability management..... 101

SUMMARY, CONCLUSION, AND RECOMMENDATIONS 104

Summary..... 104

Conclusion 105

Recommendations 106

REFERENCES 108

APPENDICES..... 112