

DEVELOPMENT OF AN ANDROID APPLICATION FOR
BLOOD PRESSURE INTERPRETATION

THESIS

KRISHNA JOY S. HASIM

College of Engineering and Information Technology

CAVITE STATE UNIVERSITY

Indang, Cavite

Cavite State University (Main Library)



T6001

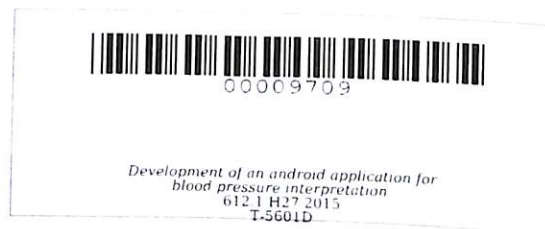
THESIS/SP 612.1 H27 2015

April 2015

DEVELOPMENT OF AN ANDROID APPLICATION FOR BLOOD PRESSURE INTERPRETATION

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

In partial fulfillment
of the requirements for the degree
Bachelor of Science in Information Technology



KRISHNA JOY S. HASIM
April 2015

ABSTRACT

HASIM, KRISHNA JOY S., Development of an Android Application for Blood Pressure Interpretation. Undergraduate Thesis. Bachelor of Science in Information Technology. Cavite State University Indang, Cavite. February 2015. Adviser: Mr. Simeon E. Daez.

The study was conducted from August 2014 to February 2015 in Cavite State University (CvSU), Indang, Cavite. The objective of the study is to develop an android application to improve the services offered by Trece Martires City Health Office (TMCHO). Specifically, the study aimed to: 1. identify the problem through surveys and interviews; 2. analyze the problem using fishbone diagram; 3. design a mobile application using Java and Android Developer Tool; 4. develop a mobile application based on the analyzed information gathered from the organization using Java and Android Developer Tool; and 5. evaluate the system through unit testing and acceptance testing. It was developed to improve the giving of information about blood pressure, interpreting blood pressure and saving the interpreted blood pressure.

The researcher used Software Prototyping Methodology as paradigm for the development of the software. It is an activity that can occur in software development and is comparable to prototyping. The methodology consists of process workflows namely requirement gathering, design, prototyping, review and update, development, testing and implementation. The respondents are composed of doctor, nurses and patients which were identified using convenience sampling.

The android application was evaluated using the questionnaire anchored in the ISO 9126 and was rated excellent on the set of characteristics such as functionality, reliability, usability, efficiency, maintainability and portability.

Blood Pressure Interpreter (BPI) helped the TMCHO address the issues that the organization is facing. The software prototyping used is suitable in developing an android application. It can be improved through related recommendations that will best serve the TMCHO. The researcher recommended to add the edit and delete feature for the saved history and add a link from the history to the management and preventions for each blood pressure reading.

TABLE OF CONTENTS

	Page
BIOGRAPHICAL DATA	iii
ACKNOWLEDGEMENT	iv
ABSTRACT	v
LIST OF TABLES	ix
LIST OF FIGURES	x
LIST OF APPENDIX TABLES	xi
LIST OF APPENDIX FIGURES	xii
LIST OF APPENDICES	xiii
INTRODUCTION	1
Statement of the Problem	3
Objectives of the Study	4
Significance of the Study	4
Time and Place of the Study	4
Scope and Limitation of the Study	5
Definition of Terms	5
Theoretical Framework	6
REVIEW OF RELATED LITERATURE	9
Related Studies	18
METHODOLOGY	21
Materials	21
Methods	21

RESULTS AND DISCUSSION	25
System Overview	25
Software Evaluation	34
SUMMARY, CONCLUSION AND RECOMMENDATION	41
Summary	41
Conclusion	42
Recommendation	42
REFERENCES	44
APPENDICES	46

LIST OF TABLES

Table		Page
1	Summary Results of the Functionality Indicators	35
2	Summary Results of the Reliability Indicators	36
3	Summary Results of the Usability Indicators	37
4	Summary Results of the Efficiency Indicators.	38
5	Summary Results of the Maintainability Indicators.	39
6	Summary Results of the Portability Indicators	40

LIST OF FIGURES

Figure		Page
1	Theoretical framework of the Android Application for Blood Pressure Interpretation	8
2	Software Prototyping Methodology	22
3	Screen layout of home page	26
4	Screen layout of description of blood pressure.	27
5	Screen layout of categories of blood pressure	28
6	Screen layout of management and preventions for each BP category . . .	28
7	Screen layout of guidelines in taking blood pressure	29
8	Screen layout of causes of high blood pressure	30
9	Screen layout of complications of high blood pressure	30
10	Screen layout of input of blood pressure	31
11	Screen layout of results review	32
12	Screen layout of history	33

LIST OF APPENDIX TABLES

Appendix Table		Page
1	Blood Pressure Categories	47
2	Gantt Chart	48
3	Frequency Distribution of Scores of the Functionality Indicators	49
4	Frequency Distribution of Scores of the Reliability Indicators	49
5	Frequency Distribution of Scores of the Usability Indicators	50
6	Frequency Distribution of Scores of the Efficiency Indicators	50
7	Frequency Distribution of Scores of the Maintainability Indicators . .	51
8	Frequency Distribution of Scores of the Portability Indicators	51

LIST OF APPENDIX FIGURES

Appendix Figure		Page
1	Fishbone diagram of unavailability of the medical staffs	53
2	Fishbone diagram of unawareness of causes, proper management and possible complications of hypertension	54
3	Fishbone diagram of effect of white coat hypertension	55
4	Use case diagram of the Development of an Android Application for Blood Pressure Interpretation	56

LIST OF APPENDICES

Appendix		Page
1	Interview Questionnaire	58
2	Sample Accomplished Interview Questionnaire	61
3	Transcript of Interview	63
4	Software Evaluation Form	67
5	Unit Testing	70
6	Sample Source Codes	73
6	Certificates	83

DEVELOPMENT OF AN ANDROID APPLICATION FOR BLOOD PRESSURE INTERPRETATION

Krishna Joy S. Hasim

An undergraduate thesis manuscript submitted to the faculty of the Department of Information Technology, College of Engineering and Information Technology, Cavite State University, Indang, Cavite in partial fulfillment of the requirements for the degree of Bachelor of Science in Information Technology with Contribution No. CEIT-2014-15-055. Prepared under the supervision of Mr. Simeon E. Daez.

INTRODUCTION

Blood pressure, sometimes referred to as arterial blood pressure, is the pressure exerted by circulating blood upon the walls of blood vessels, and is one of the principal vital signs. During each heartbeat, blood pressure varies between a maximum (systolic) and a minimum (diastolic) pressure. The blood pressure in the circulation is principally due to the pumping action of the heart. Differences in mean blood pressure are responsible for blood flow from one location to another in the circulation. Blood pressure varies in healthy people and animals, but its variation is under control by the nervous and endocrine systems. Blood pressure that is pathologically low is called hypotension, and that which is pathologically high is hypertension. Both have many causes and can range from mild to severe (Klabunde, 2005). Hypertension, also referred to as high blood pressure, is a condition in which the arteries have persistently elevated blood pressure. Every time the human heart beats, it pumps blood to the whole body through the arteries (Williams & Wilkins, 2009).