

ENVISION - A MOBILE BANKING APPLICATION PROTOTYPE FOR THE VISUALLY IMPAIRED, ELDERLY AND ILLITERATE PEOPLE

A PROJECT REPORT

Submitted by

**V. KETHARESWARAN
A. MANIKANDAN**

In partial fulfilment for the award of the degree

Of

**BACHELOR OF ENGINEERING
IN
COMPUTER SCIENCE AND ENGINEERING**



DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
UNIVERSITY COLLEGE OF ENGINEERING,
BHARATHIDASAN INSTITUTE OF TECHNOLOGY CAMPUS,
ANNA UNIVERSITY, TIRUCHIRAPPALLI-620024.

APRIL 2019

BONAFIDE CERTIFICATE

Certified that this project report titled “**ENVISION - A MOBILE BANKING APPLICATION PROTOTYPE FOR THE VISUALLY IMPAIRED, ELDERLY AND ILLITERATE PEOPLE**” is a bona fide work of V. KETHARESWARAN (810015104038) and A. MANIKANDAN (810015104044), who carried out the work under my supervision, for the partial fulfilment of the requirements for the award of the degree of Bachelor of Engineering in Computer Science & Engineering. Certified further that to the best of my knowledge and belief, the work reported herein does not form part of any other thesis or dissertation on the basis of which a degree or an award was conferred on an earlier occasion.

Place: Tiruchirappalli

Date: 02.04.2019

Dr. I. Shahanaz Begum

Assistant Professor

Dept. Of CSE/IT,

University College of Engineering,

Bharathidasan Institute of Technology Campus,

Anna University, Tiruchirappalli-620024.

HEAD

Dept. Of CSE/IT,

University College of Engineering,

Bharathidasan Institute of Technology Campus,

Anna University, Tiruchirappalli-620024.

Submitted for “**CS6811 - Project Viva-Voce**” in **B. E. Computer Science and Engineering Degree April – May 2019 Examination** held on _____

Internal Examiner

External Examiner

DECLARATION

We hereby declare that the work entitled “**ENVISION - A MOBILE BANKING APPLICATION PROTOTYPE FOR THE VISUALLY IMPAIRED, ELDERLY AND ILLITERATE PEOPLE**” is submitted in partial fulfilment of the requirements for the award of **BACHELOR OF ENGINEERING** in **COMPUTER SCIENCE AND ENGINEERING** at University College of Engineering, Bharathidasan Institute of Technology Campus, Anna University, Tiruchirappalli. It is the record of our own work carried out by us during the academic year 2018-2019 under the supervision and guidance of **Dr. I. Shahanaz Begum**, Assistant Professor, Department of Computer Science and Engineering / Information Technology, University College of Engineering, Bharathidasan Institute of Technology Campus, Anna University, Tiruchirappalli. The extent and source of information are derived from the existing literature and have been indicated through the dissertation at the appropriate places. The matter embodied in this work is original and has not been submitted for the award of any other degree, either in this or any other university.

Place: Tiruchirappalli

V. Kethareswaran

A. Manikandan

810015104038

810015104044

Date: 02.04.2019

IV yr., B. E. CSE,

Dept. Of CSE/IT,

University College of Engineering,

Bharathidasan Institute of Technology Campus,

Anna University, Tiruchirappalli-620024.

I certify that the declaration made above by my candidates are true.

Place: Tiruchirappalli

Dr. I. Shahanaz Begum

Assistant Professor

Date: 02.04.2019

Dept. Of CSE/IT,

University College of Engineering,

Bharathidasan Institute of Technology Campus,

Anna University, Tiruchirappalli-620024.

ACKNOWLEDGEMENT

We would like to thank our Hon'ble Vice Chancellor **Prof. Dr. M. K. SURAPPA** and Hon'ble Registrar **Prof. Dr. J. KUMAR**, Anna University – Chennai for having provided us permission and support in presenting our project at the Smart India Hackathon 2019 organised by Ministry of Human Resource Development, Govt. of India

We would like to thank our Hon'ble Dean **Prof. Dr. T. SENTHILKUMAR**, for having provided us with all required facilities to complete our project without hurdles and approving the submission of the project in partial fulfilment of the requirements for the award of Bachelor of Engineering in Computer Science and Engineering.

We would also like to express our sincere thanks to Hon'ble Head of the Department **Dr. D. VENKATESAN**, Assistant Professor, Department of Computer Science and Engineering, for his valuable guidance, suggestions and constant encouragement has paved way for the successful completion of this project work.

We would like to thank and express our deep sense of gratitude to our project guide **Dr. I. SHAHANAZ BEGUM**, Assistant Professor, Department of Computer Science and Engineering / Information Technology, for her valuable guidance throughout the project.

We would like to thank our Project Coordinators **Mr. C. SANKARRAM**, **Mr. P. KARTHIKEYAN** and **Mr. C. SURESH KUMAR**, Department of Computer Science and Engineering for their kind support, guidance and constant monitoring of the project reviews.

We devote our special thanks to **Dr. G. ANNAPOORANI**, Assistant Professor, Department of Information Technology and **Mr. S. PRASANNA KUMAR**, Teaching Fellow, Department of Information Technology for mentoring our project presented at the Smart India Hackathon 2019.

We are blessed to thank our Class Coordinator **Mr. S. SURENDRAN**, Teaching Fellow, Department of Computer Science and Engineering for arranging all possible assistance in completion of the project successfully.

We whole heartedly thank our friends **Ms. K. PUVIYARASI**, **Ms. K. VAISHNAVI**, our dear juniors **Mr. J. JERISH OBED**, **Ms. T. SANTHOSHINI** and **Mr. R. NAVAMADHAN** for providing insights and additional idea towards our project development in making it societal beneficial.

We also extend our thanks to all other Teaching and Non - Teaching staff for their encouragement and support.

We thank our beloved **PARENTS** for their full support in the moral development of this project.

Special thanks to all our dear and **FRIENDS** who support us in this endeavour.

ABSTRACT

ENVISION is a mobile banking application prototype for the visually impaired, elderly and illiterate people. Currently, there are almost no features on mobile banking apps to assist the Visually Impaired especially people with 100% blindness. As of now, features like screen readers and tap-based readers are available but these are error prone and haven't really been optimized to save time and effort on the user's part. This time consumption and error-filled process isn't really suitable for banking operations, due to the time involved as well as the lack of security in simply reading out the options. Unlike the above, ENVISION is built from ground up with the requirements of the visually impaired in mind. In this app, standard keyboard-based input and touchscreen-based inputs have been replaced by voice assisted screen navigation and simple gestures. These user-friendly features make it viable for elderly people to carry out banking operations via ENVISION. Also, we concentrate upon huge sect of illiterate population by making certain provisions such as regional language support for encouraging their use towards this Prototype. The implementation of this app as a proper banking solution, albeit with bank specific changes and more features, cannot come any sooner. The application has opened us the trajectory to innovations in the banking and financial sector.

TABLE OF CONTENTS

CHAPTER NO.	TITLE	PAGE NO.
	ABSTRACT	VI
	LIST OF TABLES	IX
	LIST OF FIGURES	X
1	INTRODUCTION	1
1.1	OVERVIEW OF THE PROJECT	1
1.2	PROJECT OBJECTIVES	2
1.3	MOBILE BANKING SYSTEM	3
2	LITERATURE REVIEW	5
3	EXISTING SYSTEM	12
3.1	MOBILE BANKING MODEL - EXISTING	12
3.2	INTERNATIONAL EXPERIENCE	13
3.3	MOBILE BANKING IN INDIA	13
3.4	INDIAN TELECOM SECTOR	15
3.5	RESERVE BANK OF INDIA REGULATION	16
3.5.1	TRANSACTION LIMITS IN MOBILE BANKING	16
3.5.2	SECURITY AND AUTHENTICATION	16
3.6	ISSUES AND CHALLENGES IN MOBILE BANKING	17
3.7	DRAWBACKS OF EXISTING SYSTEM	17
4	PROPOSED SYSTEM	18
4.1	SYSTEM SPECIALITIES	18
4.2	INNOVATION MODEL	19
5	SYSTEM DESIGN AND IMPLEMENTATION	20
5.1	SYSTEM ARCHITECTURE	20
5.2	TECHNOLOGY STACK	21
5.3	DATA FLOW DIAGRAM	22
5.4	INNOVATIVE MODULES	24
5.4.1	ANDROID SPLASH	24
5.4.2	DUAL SPEECH TECHNOLOGY	24
5.4.3	TOUCH AND SWIPE TECHNOLOGY	27
5.5	FEATURAL MODULES	28

	5.5.1	BIOMETRIC REGISTRY TECHNOLOGY	29
	5.5.2	MOBILE NUMBER REGISTRY	30
	5.5.3	SECURE AUTOMATION OF ONE TIME PASSWORD	31
	5.6	MATCHING AND RETRIEVAL OF BANK ACCOUNT	31
6		SYSTEM REQUIREMENTS	33
	6.1	MINIMAL HARDWARE REQUIREMENTS	33
	6.2	MINIMAL SOFTWARE REQUIREMENTS	33
7		RESULTS AND DISCUSSION	34
8		CONCLUSION AND PROPOSED WORK	35
	8.1	PROPOSED INNOVATIONS	35
		APPENDIX	36
		REFERENCE	49

LIST OF TABLES

TABLE NO.	TITLE	PAGE NO.
1	TRENDS IN MOBILE BANKING	14
2	TELECOM SUBSCRIBERS & TELE-DENSITY IN INDIA (WIRELESS + WIRELINE)	15
3	TELECOM SUBSCRIBERS & TELE-DENSITY IN INDIA (WIRELESS)	15

LIST OF FIGURES

FIGURE NO.	TITLE	PAGE NO.
1	PREFERRED BANKING MODE (%)	14
2	DIVYANG IN INDIA (%)	18
3	ENVISION SYSTEM ARCHITECTURE	20
4	ENVISION LEVEL 0 DFD	23
5	ENVISION LEVEL 1 DFD	23
6	MATCHING AND RETRIVAL OF BANK ACCOUNT IN ENVISION	32