****

**FACE CODE**

A Capstone Project

presented to the  
 Information and Communication Technology Department  
Cebu Technological University – Main Campus  
M.J. Cuenco Avenue and R. Palma St., Cebu City, Philippines 6000

In Partial Fulfillment   
of the Requirements for the degree of  
Bachelor of Science in Information   
and Communication Technology

by

Tilacas, Jerico S.

Mejias, Mark John V.

Llena, Shiela Anne V.

Asoy, Junilyn G.

Patrobinson M. Salumag,Ph.D.  
Adviser

April 2019

**DEDICATION**

We would like to dedicate this to our families that never stop supporting us to aiming our goals and the one of our sources of inspiration and to Almighty God for guiding us in every challenge that we encounter.

We also dedicate our project work to ourselves for not giving up to pursue and to finish our project. And for our Instructor Mr. Patrobinson M. Salumag for giving advices if what we do and helping us. Also, to the people who encourage us to commit our goals. We are so proud that we have accomplished such a brilliant project that could help not only on ourselves, but also for the sake of the people who will use these projects.

Lastly, we dedicate this accomplishment to all the people who got involve and have contributed in making our project.

**EXECUTIVE SUMMARY**

Our system is aiming for the curfew operation for securing data information of a minor offender which is capable of the following features using face recognition and SMS notification. Instead of doing the process of fortifying the data of the offender manually, they can use this application and easily register the names and it will automatically save to the database for keeping the records. And by the help of the SMS notification, the admin can easily send a notification to the parents of the minor offender regarding that their child has committed an offense during the curfew operation.

On the 1st offense of the juvenile the admin will input name, age, address of the juvenile including its face recognition and the contact number of their guardian. The inputted information will be automatically saved to the database of barangay admin. The administrator has the authority to access and view the record history of those juveniles who violates the curfew. On 2nd offense, they will recognize the face of the juvenile if he/she already has a record of committing the 1st offense. If the face was not recognized, they will go back to the 1st offense process that will input the name, age, address of the juvenile offender including its face recognition and the contact number of their parents. Once the minor has committed the 2nd offense the parents will be automatically notify and receive a text message from the barangay chairman who’s in charge of the curfew that they need to report and rescue their children. The admin will print a copy for those offenders who committed the 2nd offense and it will be reported to the DSWD to take an action regarding for this kind of issues. On the 3rd offense the barangay chairman will take in charge of the juvenile and continue the process if what the punishment they will give to the minor offender or the parent.

**TABLE OF CONTENTS**

**APPROVAL SHEETS i**

**DEDICATION ii**

**EXECUTIVE SUMMARY iii**

**CHAPTER I**

**INTRODUCTION 1**

Project Context 1

Purpose and Description of the Project 3

Objectives of the Project 4

Scope and Limitations 5

Significance of the Project 6

**CHAPTER II**

**REVIEW OF RELATED LITERATURE 8**

Theoretical Background 8

Related Literature 10

Related Studies 12

**CHAPTER 3**

**TECHNICAL BACKGROUND 15**

Technicality of the Project 15

Details of the Technology to be Used 16

How the Project will Work 18

**CHAPTER 4**

**METHODOLOGY 19**

Environment 19

Population of the Study 20

Requirements Specification 21

Technical Feasibility 24

Relevance of Study 26

Scheduled Feasibility 25

Timeline Feasibility 27

Economic Feasibility 28

Requirements Modeling 31

Input 31

Process 31

Output 31

Performance 33

Control 33

Data Process Modeling 34

System Flowchart 36 Object Modeling 37

Design 75

Forms 75

Reports 78

Data design 79

Entity Relationship Diagram 79

Data Dictionary 80

System Architecture 82

Network Model 82

Network Topology 83

Security 84

**CHAPTER 5**

**DEVELOPMENT 85**

Hardware Specification 85

Software Specification 86

Program Specification 87

Programming Environment 88

Front End 88

Back End 99

Deployment Diagram 102

Test Plan 103

Test Data 103

Verification, Validation, Testing 123

Unit Testing 123

Integration Testing 123

Compatibility Testing 123

Performance Testing 126

**CONCLUSION AND RECOMMENDATION 132**

**BIBLIOGRAPHY 134**

**APPENDICES 135**

1. Transmittal Letter 135
2. Evaluation Form 137
3. Source Code 139
4. User’s Manual 140

**CURRICULUM VITAE** 230

**LIST OF FIGURES**

**Title Page**

**Figure 4.0** Location of the project 19

**Figure 4.1** Organizational Chart 20

**Figure 4.2** Fishbone Diagram 22

**Figure 4.3** Functional Decomposition Diagram 23

**Figure 4.4** Requirements Modeling 31

**Figure 4.5** Iterative Development 32

**Figure 4.6** Context Diagram 34

**Figure 4.7** Data Flow Diagram 35

**Figure 4.8**  System Flowchart 36

**Figure 4.9**  System Use Case Diagram 37

**Figure 4.10** Class Diagram 38

**Figure 4.12** Sequence Diagram 40

**Figure 4.13** Activity Diagram 51

**Figure 4.14.1** Create Account Form 75

**Figure 4.14.2** Login Form 75

**Figure 4.14.3** Home Page Form 76

**Figure 4.14.4** Add Offender Form 76

**Figure 4.14.5** Recognize Form 77

**Figure 4.14.6** Record Form 77

**Figure 4.14.7** SMS Notification Form 78

**Figure 4.14.8** Report 78

**Figure 4.15** Entity Relationship Diagram 79

**Figure 4.16** Network Model 82

**Figure 4.17** Star Topology 83

**Figure 5.0.1** Admin Create Account 88

**Figure 5.0.2** Admin Login 89

**Figure 5.0.3** Home Page 89

**Figure 5.0.4** Add Minor Offender 91

**Figure 5.0.5** Fill Up All Fields91

**Figure 5.0.6** Add Offender 92

**Figure 5.0.7** Capture Face 92

**Figure 5.0.8** Add Image Success 93

**Figure 5.0.9** AddidentifySuccess 93

**Figure 5.0.10** Records 94

**Figure 5.0.11** Facerecognition 94

**Figure 5.0.12** DisplayInformation 95

**Figure 5.0.13** No Record Found 95

**Figure 5.0.14** SMS Notification 96

**Figure 5.0.15** Message Sent 96

**Figure 5.0.16** Message Receive 97

**Figure 5.0.17** Compose Message 97

**Figure 5.0.18** Print 98

**Figure 5.0.19** Print Preview 98

**Figure 5.1.0** Minor Table 99

**Figure 5.1.1** Admin Table 99

**Figure 5.1.2** Home Page Code 100

**Figure 5.1.3** Face Recognition API Code 100

**Figure 5.1.4** Camera API Code 101

**Figure 5.1.5** SMS API Code 101

**Figure 5.2** Deployment Diagram 102

**Figure 5.3.1** Login Form 127

**Figure 5.3.2** Add Minor Offender 128

**Figure 5.3.3** Save Information 128

**Figure 5.3.4** Capture Offender Image 129

**Figure 5.3.5** Detect and Recognize 123

**Figure 5.3.6** Generate Reports 130

**Figure 5.3.7** SMS Notification 130

**LIST OF TABLES**

**Title**   **Page**

**Table 4.0** System Compatibility Checking 24

**Table 4.1** System Compatibility Checking25

**Table 4.2** Gantt Chart 27

**Table 4.3**  Cost and Benefit Analysis 29

**Table 4.4** Cost Recovery Scheme 30

**Table 4.5.1** Data Dictionary 80

**Table 5.0** Hardware Specification 85

**Table 5.1** Software Specification 86

**Table 5.2** Program Specification 87