**SCHOOL BUS TRACKING AND ATTENDANCE CHECKING**

Traceability Record

**By**

Mr. Thitipun Tojareonvanich 552115018

Mr. Puttipong Tadang 552115054

Department of Software Engineering

College of Arts, Media, and Technology

Chiang Mai University

**Project Advisor**

Mr. Parinya Suwansrikham

**Document History**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Document Name | Version | Status | Date | Viewable | Editable | Responsible |
| School Bus Tracking and Attendance Checking-TraceabilityRecord-V.0.1.docx | 0.1 | Reviewed | 20/7/2015 | TT, PT, PS | TT, PT | TT, PT |

\***TT** = Thitipun Tojareonvanich, \***PT** = Puttipong Tadang, \***PS** = Parinya Suwansrikham

**Document Designed by**

Mr.Thitipun Tojareonvanich

Mr.Puttipong Tadang

**Table of Contents**

[Chapter One | Introduction 1](#_Toc425296782)

[1.1 Identification 1](#_Toc425296783)

[1.2 Project Scope 1](#_Toc425296784)

[1.3 Document Overview 1](#_Toc425296785)

[1.4 Objectives **Error! Bookmark not defined.**](#_Toc425296786)

[1.5 Work Products to be Develop **Error! Bookmark not defined.**](#_Toc425296787)

[1.5.1 Deliverable **Error! Bookmark not defined.**](#_Toc425296788)

[1.6 Acronyms and Definitions **Error! Bookmark not defined.**](#_Toc425296789)

[1.6.1 Acronyms **Error! Bookmark not defined.**](#_Toc425296790)

[1.6.2 Definitions **Error! Bookmark not defined.**](#_Toc425296791)

[Chapter Two | Infrastructure 2](#_Toc425296792)

[2.1 Software Development Life Cycle **Error! Bookmark not defined.**](#_Toc425296793)

[2.2 Development Tools **Error! Bookmark not defined.**](#_Toc425296794)

[2.3 Hardware and Material Resources **Error! Bookmark not defined.**](#_Toc425296795)

[Chapter Three | Management Procedures **Error! Bookmark not defined.**](#_Toc425296796)

[3.1 Project Team Structure **Error! Bookmark not defined.**](#_Toc425296797)

[3.2 Monitoring and Controlling Mechanisms **Error! Bookmark not defined.**](#_Toc425296798)

[3.2.1 Project Meeting **Error! Bookmark not defined.**](#_Toc425296799)

[Chapter Four | Quality Planning **Error! Bookmark not defined.**](#_Toc425296800)

[4.1 Quality Standard **Error! Bookmark not defined.**](#_Toc425296801)

[4.1.1 Basic Profile Guide Processes **Error! Bookmark not defined.**](#_Toc425296802)

[4.1.2 Project Management Process **Error! Bookmark not defined.**](#_Toc425296803)

[4.1.3 Software Implementation Process **Error! Bookmark not defined.**](#_Toc425296804)

[4.2 Reviews/Responsibility **Error! Bookmark not defined.**](#_Toc425296805)

[4.3 Testing **Error! Bookmark not defined.**](#_Toc425296806)

[4.4 Quality Factors **Error! Bookmark not defined.**](#_Toc425296807)

[Chapter Five | Schedule and Milestones **Error! Bookmark not defined.**](#_Toc425296808)

[Chapter Six | Software Configuration Management **Error! Bookmark not defined.**](#_Toc425296809)

[6.1 Software Configuration Management **Error! Bookmark not defined.**](#_Toc425296810)

[6.2 Filename Format **Error! Bookmark not defined.**](#_Toc425296811)

[6.3 Change Management **Error! Bookmark not defined.**](#_Toc425296812)

[Chapter Seven | Estimated Effort and Cost **Error! Bookmark not defined.**](#_Toc425296813)

[Chapter Eight | Risk Management **Error! Bookmark not defined.**](#_Toc425296814)

[8.1 Risk Management Process **Error! Bookmark not defined.**](#_Toc425296815)

[8.2 Risk Identification and Solutions **Error! Bookmark not defined.**](#_Toc425296816)

[Chapter Nine | Reference **Error! Bookmark not defined.**](#_Toc425296817)

Chapter One | Introduction

1.1 Purpose

“School Bus Tracking and Attendance Checking” is an Android application that uses the location service of mobile phone to track the school bus and use the built-in camera to scan the QR code for checking the student attendance. The parent can track the school bus, can see their child attendance record, can get notification when their child enter or get off the bus, and can send the alert sound to alert the driver when they drive the school over the speed limit. For reduce the parent worrying about their children.

This traceability record is the document to show the relation of the project, the link between user requirements (URS) to system requirement specification (SRS), use case, activity diagram, sequence diagram and test case.

1.2 Project Scope

“School Bus Tracking and Attendance Checking” is a mobile application which uses Android OS. This application can help to improve the school bus system and reduce the parent worrying about their children. The parent can track the school bus position, can see their child attendance record, and get notification message when their child enter or get off the school bus. In addition, the driver can check the student attendance by scan the QR code and can get the alert sound when the driver drive the bus over the speed limit.

1.3 Dependency

The purpose of the “School Bus Tracking and Attendance Checking” project plan is to guide the project team members during the development of the project.

Chapter Two | Traceability Record Table

2.1 Table : URS – SRS – UC – AD – UI

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **No** | **URS** | **Description** | **SRS** | **UC** | **AD** | **UI** |
| 1 | URS-01 | Unregistered user can register as school bus driver | SRS-01, SRS-02, SRS-03, SRS-04, SRS-06, SRS-25, SRS-32, SRS-44,  SRS-47, SRS-48,  SRS-50, SRS-51,  SRS-54, SRS-55,  SRS-57, SRS-58,  SRS-70, SRS-83 | UC-02 | AD-01 | UI-01, UI-04 |
| 2 | URS-02 | School bus driver can add unregistered user as a parent.  . | SRS-01, SRS-03,  SRS-04, SRS-25, SRS-28, SRS-44, SRS-47, SRS-48, SRS-49, SRS-50, SRS-51, SRS-53, SRS-54, SRS-59, SRS-70, SRS-71  SRS-73, SRS-83 | UC-02 | AD-02 | UI-05,UI-07,UI-08, UI-10 |
| 3 | URS-03 | School bus driver can register the children to the application. | SRS-01, SRS-03, SRS-04, SRS-05, SRS-14, SRS-25,  SRS-44, SRS-47, SRS-48, SRS-49, SRS-50, SRS-51, SRS-52, SRS-53, SRS-54, SRS-60, SRS-70, SRS-71,  SRS-74, SRS-83 | UC-02 | AD-03 | UI-05,UI-07,UI-09, UI-11 |
| 4 | URS-04 | Registered user as school bus driver, parent, children can login to the application. | SRS-06, SRS-07, SRS-08, SRS-10, SRS-26, SRS-27, SRS-28, SRS-62, SRS-63, SRS-83 | UC-02 | AD-04 | UI-05,UI-09,UI-10 |
| 5 | URS-05 | Registered user as school bus driver, parent, children can logout from the application. | SRS-06,SRS-09,  SRS-26,SRS-27,  SRS-28,SRS-83 | UC-02 | AD-05 | UI-05,UI-09,UI-10.UI-13, UI-14, UI-15 |
| 6 | URS-06 | Parents can cancel the school bus ride. | SRS-21, SRS-26,  SRS-36, SRS-75,  SRS-76, SRS-77  SRS-78, SRS-79,  SRS-80, SRS-83 |  | AD-10 | UI-10 |
| 7 | URS-07 | Registered user can view their own route. | SRS-11, SRS-12,  SRS-13, SRS-26,  SRS-27 , SRS-28,  SRS-83 |  | AD-12 | UI-06 |
| 8 | URS-08 | Parents can checking their children's attendance. | SRS-17, SRS-26,  SRS-38, SRS-83 |  | AD-07 |  |
| 9 | URS-09 | Children can receive the message when the bus are nearby. | SRS-17, SRS-22,  SRS-45, SRS-46,  SRS-83 |  | AD-08 |  |
| 10 | URS-10 | School bus driver can scan QR code for children attendance. | SRS-01, SRS-15,  SRS-39, SRS-46,  SRS-64, SRS-64,  SRS-81, SRS-83 |  | AD-06 |  |
| 11 | URS-11 | School bus driver can receive alert message from the system when they drive over the speeding. | SRS-24, SRS-28,  SRS-45, SRS-46,  SRS-83 |  | AD-13 |  |
| 12 | URS-12 | Parents can receive the message when their children arrive the school or home. | SRS-19, SRS-20,  SRS-45, SRS-46,  SRS-83 |  | AD-09 |  |
| 13 | URS-13 | School bus driver can send an extra case message. | SRS-23, SRS-28,  SRS-34, SRS-35,  SRS-36, SRS-37,  SRS-40, SRS-43,  SRS-45, SRS-46,  SRS-83 |  | AD-11 |  |
| 14 | URS-14 | School bus driver can turn on the tracking system. | SRS-28, SRS-82,  SRS-83 |  | AD-14 |  |
| 15 | URS-15 | School bus driver can turn off the tracking system. | SRS-28, SRS-82,  SRS-83 |  | AD-15 |  |

**2.2 User Requirement Specification (URS) – Software Requirement Specification (SRS)**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | **URS** | | | | | | | | | | | | | | |
| **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **15** |
| **S**  **R**  **S** | **1** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **2** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **3** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **4** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **5** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **6** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **7** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **8** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **9** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **10** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **11** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **12** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **13** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **14** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **15** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **16** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **17** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **18** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **19** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **20** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **21** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **22** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **23** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **24** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **25** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **26** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **27** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **28** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **29** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **30** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **31** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **32** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **33** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **34** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **35** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **36** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **37** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **38** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **39** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **40** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **41** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | | **URS** | | | | | | | | | | | | | | |
| **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **15** |
| **S**  **R**  **S** | **42** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **43** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **44** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **45** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **46** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **47** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **48** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **49** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **50** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **51** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **52** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **53** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **54** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **55** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **56** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **57** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **58** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **59** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **60** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **61** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **62** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **63** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **64** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **65** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **66** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **67** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **68** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **69** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **70** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **71** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **72** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **73** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **74** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **75** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **76** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **77** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **78** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **79** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **80** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **81** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **82** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **83** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

**Chapter Three | Appendix**

**2.1 User requirement specification**

URS-01 : Unregistered user can register as school bus driver

URS-02 : School bus driver can assign unregister user as parents.

URS-03 : School bus driver can assign unregister user as children.

URS-04 : Registered user as school bus driver, parent, children can login to the application.

URS-05 : Registered user as school bus driver, parent, children can logout from the application.

URS-06 : Parents can cancel the schedule.

URS-07 : Registered user can view their own route.

URS-08 : Parents can checking their children's attendance.

URS-09 : Children can receive the message when the bus are nearby.

URS-10 : School bus driver can scan QR code for children attendance.

URS-11 : School bus driver can receive alert message from the system when they drive over the speeding.

URS-12 : Parents can receive the message when their children arrive the school or home.

URS-13 : School bus driver can send an extra case message.

URS-14 : School bus driver can turn on the tracking system.

URS-15 : School bus driver can turn off the tracking system.

**2.2 Software requirement specification**

SRS-01 : System shall connect to the database.

SRS-02 : System shall provide register page for school bus driver.

SRS-03 : System shall register unregister user to their database(school bus driver database, parents database, children database).

SRS-04 : System shall validate the input of user information(First name, Last name, E-mail, phone number, school name).

SRS-05 : System shall add the registered user as children to the school bus driver list.

SRS-06 : System shall provide the login page to user.

SRS-07 : System shall validate E-mail(username) and passwords from user to login.

SRS-08 : System shall show the login error message.

SRS-09 : System shall provide logout button to user.

SRS-10 : System shall provide login button to user.

SRS-11 : System shall provide a route page to user.

SRS-12 : System shall provide a school bus position via google map api.

SRS-13 : System shall provide current location.

SRS-14 : System shall generator the QR code.

SRS-15 : System shall provide a QR code scanning page.

SRS-16 : System shall scanning the QR code to check children attendance.

SRS-17 : System shall provide status checking for children.

SRS-18 : System shall send a message to children when the bus nearby.

SRS-19 : System shall send a message to parents when their children arrive the home.

SRS-20 : System shall send a message to parents when their children arrive the school.

SRS-21 : System shall cancel the school bus driver schedule.

SRS-22 : System shall calculate approximate arrival time.

SRS-23 : System shall send the message to the parent when have an extra case.

SRS-24 : System shall send a speeding message to school bus driver.

SRS-25 : System shall show registration error messages.

SRS-26 : System shall provide parents page.

SRS-27 : System shall provide children page.

SRS-28 : System shall provide school bus driver page.

SRS-29 : System shall turn on the tracking system.

SRS-30 : System shall turn off the tracking system.

SRS-31 : System shall provide forgot password page to user.

SRS-32 : System shall provide “Create new account” text.

SRS-33 : System shall provide “CONFIRM” button.

SRS-34 : System shall provide the emergency page.

SRS-35 : System shall provide the “Send” button.

SRS-36 : System shall provide the “CANCELLATION” button.

SRS-37 : System shall provide the contact us page to user.

SRS-38 : System shall provide “ATTENDANCE RECORD” button.

SRS-39 : System shall provide “Scan QR code” button.

SRS-40 : System shall provide “TRACKING” button.

SRS-41 : System shall provide “Children list” page.

SRS-42 : System shall provide text field to user to input subject.

SRS-43 : System shall provide text box to user to input message.

SRS-44 : System shall provide text field to user to input Email.

SRS-45 : System shall provide “Notification” button.

SRS-46 : System shall provide pop-up message.

SRS-47 : System shall provide text field to user to input passwords.

SRS-48 : System shall provide check box to user to select the gender.

SRS-49 : System shall provide “Add user” button.

SRS-50 : System shall provide text field to user to input First name.

SRS-51 : System shall provide text field to user to input Last name.

SRS-52 : System shall provide text field to user to input School Name.

SRS-53 : System shall provide text field to user to input Re-email.

SRS-54 : System shall provide text field to user to input Mobile number.

SRS-55 : System shall provide button to attach the image.

SRS-56 : System shall provide “Edit” button.

SRS-57 : System shall provide text field to user to input car license plate number.

SRS-58 : System shall provide text field to user to input the car brands .

SRS-59 : System shall provide register page for parents.

SRS-60 : System shall provide register page for children.

SRS-61 : System shall provide “Home” button.

SRS-62 : System shall provide text field to user to input Email for login.

SRS-63 : System shall provide text field to user to input passwords for login.

SRS-64 : System shall show the error message ”ERROR” when QR code cannot be read.

SRS-65 : System shall provide “Facebook” icon.

SRS-66 : System shall provide “twister” icon.

SRS-67 : System shall provide “Instagram” icon.

SRS-68 : System shall provide “Pinterest” icon.

SRS-69 : System shall provide “E-mail” icon.

SRS-70 : System shall provide “SIGN UP” button.

SRS-71 : System shall provide register for parent/children page.

SRS-72 : System shall provide edit page.

SRS-73 : System shall provide “PARENT” button.

SRS-74 : System shall provide “CHILDREN” button.

SRS-75 : System shall provide cancel schedule page.

SRS-76 : System shall provide check box to select the day period for cancel the schedule.

SRS-77 : System shall provide text field to user to input the date to cancel the schedule.

SRS-78 : System shall provide text field to user to input the subject to cancel the schedule.

SRS-79 : System shall provide text field to user to input the message to cancel the schedule.

SRS-80 : System shall provide check box to select the trip for cancel the schedule.

SRS-81 : System shall send the message to parent when their children’s QR code was scan.

SRS-82 : System shall provide turn on/off toggle button.

SRS-83 : System shall send the message “Internet connection fail” when user no longer connect with the internet.

**2.3 Use cases**

UC-01 : Overall system

UC-02 : Member system

UC-03 : Tracking the system

UC-04 : Notify system

UC-05 : Alert system

**2.4 Activity diagram**

AD-01 : Register as School bus driver

AD-02 : Register as Parents

AD-03 : Register as Children

AD-04 : Login

AD-05 : Logout

AD-06 : Scan QR code for children attendance

AD-07 : Checking the children attendance

AD-08 : Receive the message when the bus are nearby

AD-09 : Receive the message when their children arrive the school or home

AD-10 : Cancel School bus ride

AD-11 : Extra case message

AD-12 : View the route

AD-13 : Alert message

AD-14 : Turn on tracking system

AD-15 : Turn off tracking system

**2.4 Sequence diagram**

SQD-01 : Register as School bus driver

SQD-02 : Register as Parents

SQD-03 : Register as Children

SQD-04 : Login

SQD-05 : Logout

**2.5 User interface**

UI-01: Login page

UI-02: Reset password page(N/A)

UI-03: Forget password (N/A)

UI-04: Register page for school bus driver

UI-05: School bus driver page

UI-06: QR code scan page (N/A)

UI-06: Route page (N/A)

UI-07: Register page for Parent/ Children

UI-08: Register page for Parent

UI-09: Register page for Children

UI-10: Parent page

UI-11: Children page

UI-12: Contact us page (N/A)

UI-13: School bus driver edit page (N/A)

UI-14: Parent edit page (N/A)

UI-15: Children edit page (N/A)