Project Plan

Computer Science Department

Texas Christian University

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Revision History

The following is a history of document revisions:

Version	Changes	Edited
Version 1.0	Initial Draft	October 17, 2013
Version 1.1	Edited Initial Draft	October 25, 2013
Version 1.2	Section 1: • Fixed wording in 1.1 and 1.2. Section 2: • Rewrote background subsection and removed Scope subsection. Section 3: • Added more software and detailed specs to hardware. Section 4: • Added Iteration Description subsection and revised/reworded all other subsections. Section 5: • Removed unused terms, and added more detailed project-specific terms.	November 17, 2013
Version 2.0	Section 2: • Revised Project Background Section 3: • Updated Software	February 3, 2014
Version 3.0	Section 3: • Updated Contacts Section 4: • Updated Milestones and Deliverables	March 7, 2014
Version 4.0	Section 4: • Updated Milestones and Deliverables • Updated Iteration Descriptions • Updated Walkthroughs	April 23, 2014
Version 4.1	Section 1: • Removed Appendix A wording Section 4: • System and User Acceptance Testing	May 5, 2014

Revision Sign-Off

By signing the following, the team member asserts that he or she has read the entire document and has, to the best of knowledge, found the information contained herein to be accurate, relevant, and free of typographical errors.

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Project Plan

Version 4.1

1. Introduction

1.1. Purpose

This document provides an overview for the FrogStar project. Presented within this document are the software and hardware resources, a schedule for significant milestones and deliverables, the roles and responsibilities of individual team members, and risk management strategies. A glossary of technical and project-specific terms used is also provided.

1.2. Section Overview

Section 2 – Project Overview: Gives background information and inspiration for the project.

Section 3 – Resource Specification: Identifies the project support environment (PSE).

Section 4 – Project Management: Lists the team members and their roles/responsibilities, team meeting times, communication methods, possible risks, and schedules for milestones, deliverables, and walk-throughs.

Section 5 – Definition of Terms: Defines technical and project-specific terms used in this document.

2. Project Overview

2.1. Project Background

In the event of a vehicular accident, there are many scenarios in which the occupants become incapacitated and unable to call for assistance. There exist systems, e.g., OnStar, that currently provide accident detection and roadside assistance services. However, the cost of these proprietary systems and their availability for all vehicular models limit their use.

Recently, Texas Instruments released an inexpensive, Bluetooth-enabled SensorTag that features an on-board accelerometer and a gyroscope. These sensors can be used to detect a high-speed accident when used in tandem.

Project FrogStar employs the use of TI SensorTags with two controlling devices, a single board computer as an on-board control unit (OBCU) and a smartphone, to explore the possibility of detecting a serious accident. The controlling devices serve as redundant checks when an accident is detected. In the event of an emergency, the smartphone has the capability to contact emergency responders via cellular networks. The use of NFC tags provide a convenient way of enabling or disabling the system.

3. Resource Specification

3.1. Software

Programming Environment

- Android Development Toolkit Plugin (2.2) for Eclipse.
- BlueZ 5.2
- Eclipse: Kepler (4.3.1) Service Release 1
- GCC 4.8.2
- Rasbian Linux
- Windows 7 64-bit SP 1

File Transfer and Version Control

- CoreFTP Lite 2.2
- Tortoise SVN 1.7.10
- Windows 2008 Server running Subversion & IIS

Productivity Software

- Adobe Master Collection CS6
- Microsoft Office 2010
- Microsoft Visio 2013
- Notepad++ 6.5.1
- SCR Screen Recorder

3.2. Hardware

- NFC Tag
- Pluggable USB Bluetooth 4.0 LE Adapters (5)
- Raspberry Pi
- Samsung Galaxy S4 (Android 4.2.2)
- TI CC2541 SensorTags (4)

3.3. Client Contacts

Dr. Liran Ma: l.ma@tcu.edu

Dr. Donnell Payne: d.payne@tcu.edu

Texas Christian University: 2800 S University Dr., Fort Worth, TX 76129

4. Project Management

4.1. Milestones and Deliverables

October 17, 2013 - Project Proposal
October 17, 2013 - Project Plan Document (Version 1.0)
October 17, 2013 - Skeleton Website
October 22, 2013 - Project Support Environment (PSE)
October 31, 2013 - Requirements Document (Version 1.0)
December 2, 2013 - Design Document (Version 1.0)
December 2, 2013 - Iteration 1
January 31, 2014 - Iteration 2
February 4, 2014 - Faculty Presentation
March 4, 2014 - Iteration 3
March 20, 2014 - SRS Abstract Submission Due
March 24, 2014 - Abstract Deadline NTASC
April 3, 2014 - SRS Electronic Poster Submission Due
April 3, 2014 - Student Research Symposium Poster Due
April 5, 2014 - NTASC
April 11, 2014 - Student Research Symposium
April 18, 2014 - Iteration 4
April 23, 2014 - User Manual (Version 1.0)
April 23, 2014 - Developer Manual (Version 1.0)
April 29, 2014 -System Integration and User Acceptance Testing
May 1, 2014 - Final Presentation
May 2, 2014 - Complete All Documents
May 5, 2014 - Final Product DVD

4.2. Iteration Descriptions

4.2.1. Iteration 1

Smartphone-to-OBCU board and OBCU-to-SensorTag communication methods shall be established, NFC tag functionality shall be implemented, training for smartphone programming shall be completed, accident-detection methods shall be explored, and research shall be conducted on car collisions.

4.2.2. Iteration 2

User interface for the smartphone application shall be completed and preliminary networking programs on the OBCU shall be implemented.

4.2.3. Iteration 3

The accident detection system shall be completed for the smartphone and testing of the overall smartphone application and smartphone-side accident detection system shall begin.

4.2.4. Iteration 4

The accident detection system shall be implemented on the OBCU, network communication shall be finalized, and complete system integration testing and user acceptance testing shall be complete.

4.3. Team Member Roles and Responsibilities

Stockton Ackermann - Documentation Lead, Android Application Developer

Nicholas Capurso - Project Lead, Android Application Developer, and Network Engineer

Eric Elsken - Technical Lead and Android Application Developer

Myrella Garcia – Website Developer and Media manager

Casey Stephens – Android Application Developer

David Woodworth – Testing Lead, Network Engineer, and Website Developer

4.4. Monitoring and Reporting Mechanisms

4.4.1. Meetings

A mandatory team meeting has been agreed to occur every Wednesday at 3:30 PM in the Tucker Technology Center. When this time is not feasible for the group, the backup meeting time is Monday at 6:00 PM. Team members are also expected to attend the Senior Design class twice weekly for in-class work. Weekly meeting times are subject to change based on schedules of team members and additional meetings will be scheduled if necessary.

4.4.2. Communication

Every person on the team has a cell phone that allows for group messaging. Both CoreFTP 2.2 and Tortoise SVN 1.7.10 will be used for file transfer and version control between the team. Meeting times with clients can be set up through phone calls, e-mail, or in person.

4.4.3. Requirements Control

To ensure project requirements are met, the Testing Lead will test each iteration thoroughly against the Requirements document. All proposed requirement changes must be accepted by the project's clients. Extra work will be done and meetings will take place accordingly if requirements are changed.

4.4.4. Weekly Activity Reports

Weekly reports shall be written at the time of the team's weekly mandatory meeting. Each report shall include the unique task that was assigned to each team member, their estimated and actual time spent working on that task, the completion status of the given task, and any additional comments. These reports shall also be uploaded onto the project website within 24 hours of the weekly meeting.

4.4.5. Walk-Throughs

October 17, 2013	- Project Proposal
October 17, 2013	- Project Plan Document (Version 1.0)
October 17, 2013	- Skeleton Website
October 31, 2013	- Project Support Environment (PSE)
October 31, 2013	- Requirements Document (Version 1.0)
December 2, 2013	- Design Document (Version 1.0)
December 2, 2013	- Iteration 1
January 31, 2014	- Iteration 2
March 4, 2014	- Iteration 3
April 3, 2014	- Student Research Symposium Poster Due
April 5, 2014	- NTASC
April 9, 2014	- User Manual Drafting
April 11, 2014	- Student Research Symposium
April 18, 2014	- Iteration 4
April 23, 2014	- Developer Manual Review
April 29, 2014	-System Integration and User Acceptance Testing
May 1, 2014	- Final Presentation
May 2, 2014	- Complete All Documents
May 5, 2014	- Final Product DVD

4.5. Risk Management

4.5.1. Risk Analysis and Planning

Contingency	Probability/Severity	Mitigation Strategy
Sampling rate not fast enough	Medium/Critical	Communicate with Dr. Ma to see what can be accomplished.
Illness	Low/Low	We have enough personnel to communicate with one another to share progression in the project.
Achieving Set Deadlines	Low/Critical	Maintain weekly status reports and work hard.

5. Glossary of Terms

Android – An open-source operating system developed for mobile devices by Google.

Bluetooth – A short-ranged, peer-to-peer, wireless communication protocol. Bluetooth LE refers to a low-energy Bluetooth standard.

BlueZ – A Linux software package that provides support for Bluetooth protocols.

Deliverable – A work product delivered to the client.

GCC – GNU Compiler Collection – A compiler system that supports many programming languages.

FTP – File transfer protocol – Allows files to be transferred to and from a server.

Milestone – A point where project progress can be assessed.

NFC – Near-field communication – A set of standards that allow devices to communicate in very close proximity.

NTASC – North Texas Area Student Conference – Annual student conference held at Midwestern State University.

OnStar – A subscription-based service that provides in-vehicle features such as automatic crash response, roadside assistance, and navigation.

PSE – Project Support Environment – The software and hardware tools needed to complete the project.

Raspberry Pi – An inexpensive, single-board computer that can support an operating system and user data held on a secure digital (SD) card. Bluetooth and Wi-Fi capability can be added via adapters plugged into its USB ports.

SVN – Subversion – Allows for version control, and file management and sharing among team members.

TI CC2541 – A Bluetooth-capable SensorTag offered by Texas Instruments that houses various sensors including an accelerometer, gyroscope, and thermometer.

Walk-through – Points during the project where the team walks through significant project components with other team members and /or clients.

