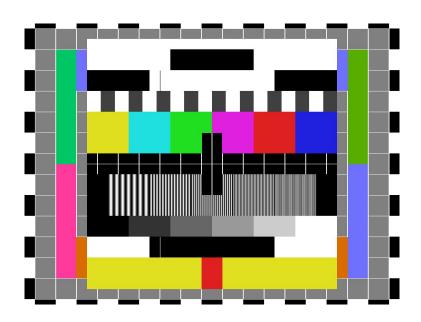# DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
THE UNIVERSITY OF TEXAS AT ARLINGTON

PROJECT CHARTER
CSE 4316: SENIOR DESIGN I
FALL 2017

TEAM 2
RFID AUTOMATED STUDENT DISMISSAL

BIBEK KHATAKHO
AUSTIN HASTINGS
KASHIF IQBAL
NUPUR PANDEY
ALBARO TONOCO

REVISION HISTORY

Revision	Date	Author(s)	Description
0.1	10.06.2017	AH	document creation
0.2	11.12.2017	BK, AH, NP, AT	document revision
0.3	11.19.2017	AH, NP, AT	document revision
1.0	12.10.2017	BK, AH, KI, NP, AT	document revision

CONTENTS

1   VISION

For parents that pick up their children from school, it is often a long and tedious process. Pulling into the designated lane amongst several other parents and their vehicles, having a staff member verify who they are, whom you are picking up and then calling out your child's name over the radio to finally have them get ready to leave the building with all their belongings. To address this concern, we are building an automated system that will verify who has arrived, what student needs to be made ready for dismissal and to send that information over to a centralized location for staff to streamline dismissal.

2   MISSION

The primary mission of this project is to replace traditional method of picking children from school. The system will use Rfid scanner to scan the incoming vehicle of parents of the children in school. The application that run in windows will process the information collected by scanner. The Rfid scanner scan the vehicle with rfid sticker and display the information of the parents and children in the gui. The interactive gui will show the list of information of children whose parents have arrived. The list will be updated as new vehicle is detected by the scanner. The application will show the names of students who have left and who have not left from school on that particular day. The application will also save the information in database for future reference.

3   SUCCESS CRITERIA

This project will be considered successful if the outcome is able to replicate the core functionalities of the current staff employee's dismissal duties by the RFID reader. Namely, the ability to relay arriving parents notice to the correct staff members who have authorization to dismiss that parent's child. The goal will require the construction of a RFID reader, housing, and mount connected to the system which will not succumb to outside elements. A successful example would be that the parents drive by with a RFID Tag placed on the windshield of their vehicles, the RFID reader, reads the tag and sends that notice to the system database to query and recover all associated information for the staff member to confidently release/dismiss the child that belongs to that parent all before the parent arrives to the pickup area.

4 BACKGROUND

The idea for this project was addressed by the professor to the group. One of the professors on campus had to go pick up her kid from school. There the parents take a paper with the child's name so that the employees at school knew who the parent want to pick up. This method is slow as parents had to wait for a while before they saw their children, it is not convenient for the school employees as they had to adjust for all sort of weather and it is not safe for the child as people with evil intentions can have access to kids name. The team decided to take on this project because we realized that the concern is serious and if we can finish the project and bring it in-front of schools they will be able to use it. This will not only benefit us as students rather the parents, kids, employees at school as well as school. This project has real-world benefit and can be used in multiple fields. For example, this project can be used at a fast food place as well as customers can order using their phone where they can enter their license plate number and when they come inside the field of fast food place, the fast food employee can bring their food out right away after the scanner reads their license plate. Analyzing the wide range of fields where this project can be used in real world and the positive impacts that it can have on people and businesses, we have chosen this project.

5 RELATED WORK

There are similarly related applications for schools to utilize that would help with tracking the students at various times of uncertainty such as when the students travels by bus and when they arrive at school. The related commercially available products are listed below:

- http://www.laconictechnology.com/education-sector.html - School Bus Attendance Model (GPS + RFID), Basic GPS Tracking Systems, GPS + RFID Systems.

- http://northstar.global/rfid-school-bus-tracking-system/ - Northstar's RFID system helps track the movement of children in schools and verifies if students are getting off at the right bus stop. It also helps automate attendance.

- http://rfid.thingmagic.com/rfid-blog/bid/50802/RFID-for-Student-Tracking - he benefits of RFID-enabled student tracking solutions are providing secure access to a building and recording attendance.

These systems are primarily put in place for when the students arrive or when they board transportation provided by the school for parents to have SMS updates sent to their phones in real time. Our project will utilized the same technology but only focus on the dismissal tracking for students so that the system automates what child needs to be made ready for dismissal whenever their parent has arrived and is ready to pick up their child.

6 SYSTEM OVERVIEW

The platform will be designed using progressive web applications, which are websites that when access from mobile devices, look and feel just like a mobile application native to the environment. When accessed from a computer, the browser would look like a regular page, but when accessed from a mobile device will look and act like a mobile application.

7 ROLES & RESPONSIBILITIES

Kashif Iqbal is the System Architect. Kashif is one of the two Software Engineers in our team, he has been exposed to 10 different languages throughout his academic time here at UTA. Some of the coursework that he is currently taking which includes Design Patterns and Object Oriented Software Engineering (Agile Methodology) would be very useful for our Senior Design project. He has extensive

knowledge of Python, C/C++, Java and MySQL which will most likely be the grounds for this project. He is in charge of picking the Design Patterns, relevant libraries, the Database Model, and the Model Infrastructure. He will extract the RFID information from the reader and relay it down the pipeline.

Bibek Khatakho is the Front End Developer. He has also taken ARTS class and some design courses which will help him to design interactive GUI for the project. He is proficient with C++, Java, and Python. He will design the user interface. This includes the Sign-in page, the Admin page, and the generic Staff page.

Albaro Tinoco is the Hardware Integrator. Always being on time and ready to work whenever the scheduled time is. He strives to make the working environment likeable by keeping our spirits high by having conversations and making compromises. His programming development skills experience comes from working on school projects. He is interested in GUI based front-end applications and making videogames with extensive knowledge in Python, C/C++, Java and MySQL. He will connect the reader to the computer physically and design hardware to support the scanner off the ground.

Austin Hastings is in charge of documentation, will help with debugging and is Scrum Master. He is experienced with Java, Matlab, and Python. He also has knowledge in C, C++, C#, and SQL. He is interested in Cyber Security and will make sure the system is as secure as possible. As Scrum Master, he is in charge of establishing sprint goals.

Nupur Pandey is the Back End Developer. He has work experience with MS- SQL. He has also worked as a back end developer for multiple projects here on campus. He has extensive knowledge of Python, C#, C/C++, Java and MySQL which will most likely be the grounds for this project. He is in charge of generating the database schema, scripts and formatting queries.

8 FACILITIES & EQUIPMENT

The development and prototyping of RDF student pick-up will take place in Senior Design Lab. All the hardware design and development will take place in the lab during Senior Design I. We have received the RFID reader from the school. We will also be using common tools such as the drills, screwdrivers, saws, and allen wrenches from the Senior Design Lab. We may use a 3D printer as the need arises. Tools that are not available from the lab will be brought by our team with Professor's approval. Upon completion of the RFID student pick-up, we will be testing it at the senior design lab and parking lot of the school.

9 COST PROPOSAL

We have $800 provided by the Computer Science department of UTA for the project. At the moment, we do not have any financial donors for the project. We are going to use personal computer and the Rfid scanner for the lab, so we will not have much expenditure. We will spend approximately $100 to buy the hardware to structure the system.

9.1 PRELIMINARY BUDGET

Purchase Hardware: To recognize vehicle. Purchase Hardware: To store database. Purchase Hardware: To display results.

9.2 CURRENT & PENDING SUPPORT

Purchased RFID Scanner.

10 DOCUMENTATION & REPORTING

In this section, all of the various artifacts that are to be generaterated and maintained are described.

10.1 PROJECT CHARTER

The Project Charter is this document. It will be updated as major changes are updated, and will provide a guiding backbone for the progress of this project.

10.2 PRODUCT BACKLOG

As product gets backlog, more manhours will be applied in importance order. This form will be used to designate what was expected to be accomplished, yet was not completed.

10.3 SPRINT PLANNING

Sprints will be planned with all team members present at the beginning of all sprints. Changes to the expectations to a sprint will take place with at least a majority in concensus.

10.3.1 SPRINT GOAL

Sprint goals will generated during planning and rechecked before the end of each sprint. Failing to complete all tasks for a sprint goal will cause reevaluation of future deadlines and will be tracked in the product backlog.

10.3.2 SPRINT BACKLOG

Sprint Backlogs will be re-evaluated and worthwhile actions will be added to subsequent sprints.

10.3.3 TASK BREAKDOWN

Tasks will be divided to each team member's specialities. Free members will be applied to Tasks overlapping or concurrent to busy team members.

10.4 SPRINT RETROSPECTIVE

Activities done during sprints will be reviewed and successful activites will be promoted to be attempted again. The retrospective will be a time of communication and free flowing of ideas.

10.5 INDIVIDUAL STATUS REPORTS

Individual Status Reports will be generated by each team member.

10.6 ENGINEERING NOTEBOOKS

Engineering Notebooks will be kept by all team members and checked as needed to remain in regulation. Each team member is free to fill their notebook with relevant figures and information to complete their tasks.

10.7 CLOSEOUT MATERIALS

Closeout Materials will we generated before the completion of the project. These materials include a How To demo, product website, a product poster, and a video of use.

10.7.1 SYSTEM PROTOTYPE

A working System Prototype will be implimented before May 2018.

10.7.2 PROJECT POSTER

A detailed Project Poster will be created before May 2018.

10.7.3 WEB PAGE

A Web Page documenting the design process and related material may be created before May 2018.

10.7.4 DEMO VIDEO

A Demo Video will be created, showing the product in action, before May 2018.

10.7.5   SOURCE CODE

Source Code will be hosted on GitHub.

10.7.6   SOURCE CODE DOCUMENTATION

Source Code Documentation will be taken care of by Doxygen.

10.7.7   HARDWARE SCHEMATICS

Hardware Schematics will be maintained as hardware is purchased or manufactured. These will be available upon project completion.

10.7.8   CAD FILES

CAD files will be hosted on GitHub.

10.7.9   INSTALLATION SCRIPTS

Installation Scripts will be installed to hardware before reaching the site.

10.7.10   USER MANUAL

A User Manual will be created and either available on the website or in physical copy.

REFERENCES

[1] Kenneth S Rubin. *Essential Scrum: A Practical Guide to the Most Popular Agile Process*. Addison-Wesley Professional, 1st edition, 2012.