Department of Computer Science & Engineering
The University of Texas at Arlington

System Requirements Specification
CSE 4316: Senior Design I
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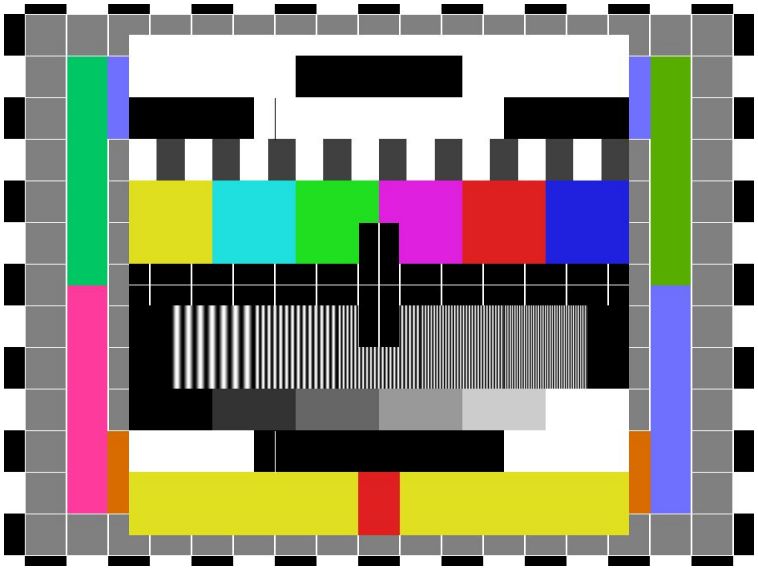

Team 2
RFID Automated Student Pickup

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1 Product Concept

This section describes the purpose, use, and intended user audience for the RFID Automated Student Pickup (RASP) System. The system detects vehicles with RFID tags and can display the information of related individuals to be released, providing a swift and secure channel for dismissing students.

1.1 Purpose and Use

RASP contains both hardware and software. The hardware used will detect RFID tags and transmit the data to a local database. This database will have both an active and passive mode. While in active mode the data queried will generate a list of students to dismiss in a queue. Passive mode will allow system administrators to modify the database, view logs of information and view trends in the data collected.

1.2 Intended Audience

The Intended Audience is Elementary Schools. These schools currently have systems in place which require active participation by multiple educators. This system hopes to alleviate some of the required labor of dismissing students, while also providing a base level of security and increasing the flow of students leaving. This product is designed for comercial use, but intended to be standalone. The system is customizable for the site of deployment.

2 Product Description

This section provides a description of your product and defines it's primary features and functions. The purpose is to give the document reader/reviewer enough information about the product to allow them to easily follow the specification of requirements found in the remainder of the document. Your header for this section should introduce the section with a brief statement such as: "This section provides the reader with an overview of X. The primary operational aspects of the product, from the perspective of end users, maintainers and administrators, are defined here. The key features and functions found in the product, as well as critical user interactions and user interfaces are described in detail." Using words, and pictures or graphics where possible, specify the following:

2.1 Features & Functions

What the product does and does not do. Specify in words what it looks like, referring to a conceptual diagram/graphic (Figure X). Define the principle parts/components of the product. Specify the elements in the diagram/graphic that are part(s) of this product as well as any associated external elements (e.g., the Internet, an external web server, a GPS satellite, etc.)

2.2 External Inputs & Outputs

Describe critical external data flows. What does your product require/expect to receive from end users or external systems (inputs), and what is expected to be created by your product for consumption by end users or external systems (outputs)? In other words, specify here all data/information to flow into and out of your systems. A table works best here, with rows for each critical data element, and columns for name, description and use.

2.3 Product Interfaces

Specify what all operational (visible) interfaces look like to your end-user, administrator, maintainer, etc. Show sample/mocked-up screen shots, graphics of buttons, panels, etc. Refer to the critical external inputs and outputs described in the paragraph above.

3 Customer Requirements

Customer requirements are those required features and functions specified for and by the intended audience for this product. This section establishes, clearly and concisely, the "look and feel" of the product, what each potential end-user should expect the product do and/or not do. Each requirement specified in this section is associated with a specific customer need that will be satisfied. In general Customer Requirements are the directly observable features and functions of the product that will be encountered by its users. Requirements specified in this section are created with, and must not be changed without, specific agreement of the intended customer/user/sponsor.

3.1 RFID Tag Correlates To Database Information

3.1.1 Description

The system shall be able to match the RFID with the student in local database that has already been created.

3.1.2 Source

Product customer

3.1.3 Constraints

RFID shall read lookup the database and provide the necessary information.

3.1.4 Standards

At this moment team is not aware about the standards with this requirements.

3.1.5 Priority

Critical

3.2 Release Student

3.2.1 Description

The system shall allow users to release/remove students from the queue in local database at dismissal when necessary. Utilizing the GUI to release students, the user will select from a list of current students ready for dismissal and the user will select which student is being dismissed out of available students and click the dismissal submit button.

3.2.2 Source

CSE Senior Design project specifications

3.2.3 Constraints

There are no foreseeable constraints for this requirement

3.2.4 Standards

No specific standards that apply to this requirement

3.2.5 Priority

Critical

3.3 System Login

3.3.1 Description

The system shall implement a secure login for users to utilize the system. The system login shall have a username and a password for each individual user. Once the user has successfully logged in to the system, all functionality associated with that user level will be granted.

3.3.2 Source

CSE Senior Design project specifications

3.3.3 Constraints

There are no foreseeable constraints for this requirement

3.3.4 Standards

No specific standards that apply to this requirement

3.3.5 Priority

Critical

3.4 Able To Update Database

3.4.1 Description

The system shall allow admin to enter student(s) records in the local database that includes their first name, last name, middle name, student id, parent's infromation and student's picture.

3.4.2 Source

Product customer

3.4.3 Constraints

Admin shall enter all the student information correctly.

3.4.4 Standards

At this moment team is not aware about the standards with this requirements.

3.4.5 Priority

Critical

3.5 Revise Log

3.5.1 Description

The system shall allow users to make changes to the student log if necessary. Utilizing the GUI from releasing students, the user will be allowed to undo a dismissed student if necessary.

3.5.2 Source

CSE Senior Design project specifications

3.5.3 Constraints

There are no foreseeable constraints for this requirement

3.5.4 Standards

No specific standards that apply to this requirement

3.5.5 Priority

Critical

3.6 Additional Administrator Privilege

3.6.1 Description

The application will provide only limited access to the staff. Admins and general staff will be check out the students based upon the arrival of their parents. Admins will also perform other functions such as adding students, removing students and changing RFID tags.

3.6.2 Source

Product customer

3.6.3 Constraints

N/A

3.6.4 Standards

No specific standards that apply to this requirement

3.6.5 Priority

High

3.7 Display Student information

3.7.1 Description

The system shall display on the dismiss GUI the students picture and details regarding the student whenever the RFID reader has confirmed parent to pick up the student. The student details shall be the Student's Full Name, Teacher, Grade Level, Vehicle information.

3.7.2 Source

CSE Senior Design project specifications

3.7.3 Constraints

There are no foreseeable constraints for this requirement

3.7.4 Standards

No specific standards that apply to this requirement

3.7.5 Priority

Moderate

3.8 Dismissal Log

3.8.1 Description

The system shall keep a running log in the local database of students who have been picked up and those who have yet to be picked up for the current day of dismissal. This running log shall be made available to any user by clicking the student log button.

3.8.2 Source

CSE Senior Design project specifications

3.8.3 Constraints

There are no foreseeable constraints for this requirement

3.8.4 Standards

No specific standards that apply to this requirement

3.8.5 Priority

Moderate

3.9 Administration Record Log

3.9.1 Description

Whenever the administrative panel perform any modification in the system such as add students, change students or change RFID tags, it shall be stored the log. This will provide accountability. This record will not be overwritable.

3.9.2 Source

CSE Senior Design project specifications

3.9.3 Constraints

There are no foreseeable constraints for this requirement

3.9.4 Standards

No specific standards that apply to this requirement

3.9.5 Priority

Moderate

4 Performance Requirements

Performance requirements address items such as: how fast specific critical operations must complete; how long it takes to start/stop activities; how long the battery must last; maximum time it must take to set up; etc.

4.1 Quick RFID Detection

4.1.1 Description

When the scanner detects any RFID tags around , it sends signal to the application. The application should then display the name and image of a student who is linked to that RFID tag. This entire seconds should be done under 2 seconds once the scanner reads a tag.

4.1.2 Source

CSE Senior Design project specifications

4.1.3 Constraints

RFID API connection

4.1.4 Standards

No specific standards that apply to this requirement

4.1.5 Priority

High

4.2 Maximum RFID Tag Detection Error Rate

4.2.1 Description

The system shall not throw out any undesired error while it is in operation. Testing shall be performed with deep caution by the team and the errors that might take place should be less that 2 percentage.

4.2.2 Source

Product customer

4.2.3 Constraints

The system shall be error free .

4.2.4 Standards

At this moment team is not aware about the standards with this requirements.

4.2.5 Priority

Medium

4.3 RFID Tag Extraction

4.3.1 Description

The system shall be able to extract the RFID number from the RFID Tags example, windshield stickers and Cards.

4.3.2 Source

other requirerments

4.3.3 Constraints

RFID shall extract the tags and it is one of the main constrainsts for this project.

4.3.4 Standards

At this moment team is not aware about the standards with this requirements.

4.3.5 Priority

Critical

5 Safety Requirements

Safety requirements might address items specific to your product such as: no exposure to toxic chemicals; lack of sharp edges that could harm a user; no breakable glass in the enclosure; no direct eye exposure to infrared/laser beams; packaging/grounding of electrical connections to avoid shock; etc.

5.1 Log Responsible Staff Member

5.1.1 Description

After the student has been checked out or cleared by the school staff, that information need to be updated in the system. The time of check in or check out should be correclty entered for the security of the student.

5.1.2 Source

Product customer

5.1.3 Constraints

The system shall correctly log the information.

5.1.4 Standards

At this moment team is not aware about the standards with this requirements.

5.1.5 Priority

High

5.2 Weatherproof System

5.2.1 Description

As the RFID reader need to scan the cars that will all be done outdoors. Due to the bi-polar weather here in Texas, the system shall be weather proof such as water proof, heat resistant and wind proof.

5.2.2 Source

Product customer

5.2.3 Constraints

The system shall with stand normal texas weather.

5.2.4 Standards

At this moment team is not aware about the standards with this requirements.

5.2.5 Priority

Medium

6 Maintenance & Support Requirements

Maintenance and support requirements address items specific to the ongoing maintenance and support of your product after delivery. Think of these requirements as if you were the ones who would be responsible for caring for customers/end user after the product is delivered in its final form and in use "in the field". What would you require to do this job? Specify items such as: where, how and who must be able to maintain the product to correct errors, hardware failures, etc.; required support/troubleshooting manuals/guides; availability/documentation of source code; related technical documentation that must be available for maintainers; specific/unique tools required for maintenance; specific software/environment required for maintenance; etc.

6.1 Register RFID Tag

6.1.1 Description

The system shall allow admin users to register RFID tags and associate those tags with students. Whenever introducing a new RFID tag, the admin user will register the new tag with the system then associate it with a student in need.

6.1.2 Source

CSE Senior Design project specifications

6.1.3 Constraints

There are no foreseeable constraints for this requirement

6.1.4 Standards

No specific standards that apply to this requirement

6.1.5 Priority

Moderate

6.2 Administrator Maintainence

6.2.1 Description

The admin shall be able to add staffs who shall be able to login and use the system to check out the students. The admin shall have enter all the necessary information of the staff who is being added. For security purposee the staffs shall have a secure login. furthermore, if new admin needs to added, the existing admin can allow or disallow the school staff to be the admin.

6.2.2 Source

Product customer

6.2.3 Constraints

The system shall allow admins to add new users.

6.2.4 Standards

At this moment team is not aware about the standards with this requirements.

6.2.5 Priority

High