### Inf 43 – Fall Session, 2013 – Big Assignment 2

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| Awarded Points | Maximum Points | Document Aspect |
|  | 15 | Clarity of writing (spelling, grammar, sentence construction) and Clarity of expression (flow, structure, making logical arguments). Roughly 7.5 each. |
|  | 10 | Introduction / Executive Summary (can be different sections or combined into one) |
|  | 10 | Application Context / Environmental Constraints (can be different sections or combined into one) |
|  | 35 | Functional Requirements Specification, including use-case diagram and each use case (following a use-case template). |
|  | 7.5 | Software Qualities and Non-functional Requirements |
|  | 7.5 (+5) | Other Requirements and Other Items. At least a Glossary of Terms. You can earn up to 5 points Extra Credits if you go beyond Glossary |
|  | 7.5 | Assumptions / Risks (can be different sections or combined into one) |
|  | 7.5 | Priorities / Implementation Phases;  Future Directions and Expected Changes |
|  | **100** | TOTAL |

ABC Inc. Parking Management System Requirements

###### October 26, 2013

Ford Tang

##### Introduction

ABC Inc. needs a new parking management software system that will help modernize the existing parking software system. The current system lacks efficiency and there is a need for better emergency response. The new system will provide management for all US locations, both for offices and sales store locations.

The sections of this document are:

1. Executive Summary
2. Environmental Constraints
3. System Requirements
4. Non-Functional Requirements
5. Other Requirements
6. Risks
7. Implementation Phases
8. Future Directions

##### Overview / Executive Summary

Goals of the new parking management software system are:

* To reduce the time necessary to find parking: alleviated by parking sensors, parking billboard notification and mobile application.
* To provide necessary and adequate emergency response to customers: parking patrols and personnel will contact customers through mobile application, local callboxes, parking camera system, parking speaker system and parking structure light system.
* To update and incorporate current web portal: The update to the web portal will provide employees with current parking status, available spots and employees will also be able to find their permit number from the portal.

The new system will affect all customers and employees parking in the structure/lot, by providing additional information that will help the efficiency of parking. Parking personnel will have to handle new responsibilities of the ticket system and emergency response procedures. Overall, the initial implementation of the system should not disrupt business as usual.

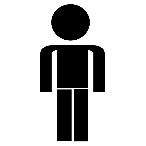
##### Application Context / Environmental Constraints

The new system software will be built to run on a server platform. This will keep a database for the ticket system and parking monitoring software, along with emergency response system and camera systems of the parking lot/structure. The web portal will be web based and will access the server for parking status and availability and will also access the company server for permit information. The mobile application will be built to support the top few mobile operating systems, such as iOS and Android. Mobile application and web portal should be built for ease of use and one handed operation, if possible.

##### System Requirements Specification

This section will provide detailed specifications for the requirements through use cases. The actors of the use cases are the Customer, Parking Patrol Personnel and the Server. The cases are “Acquiring a Parking Ticket”, “Surrendering the Parking Ticket”, the “Emergency System”, and finally, the “Parking status” system.

The parking structure/lot system:

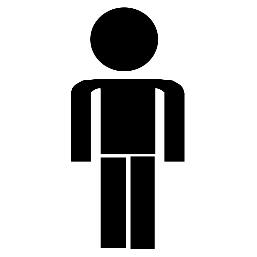


Parking System

Acquire Parking Ticket

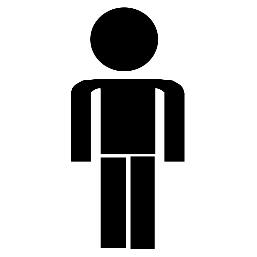
Surrender Parking Ticket

Customer



Server

Emergency System



Parking Patrol

Parking Status

Ticket System Basic Flow

1. The Customer arrives at the entrance gate.
2. The system notifies the Server and dispenses a ticket to the Customer.
3. The Customer takes the ticket and parks.
4. The Customer leaves the parking spot and heads to exit booth.
5. Customer surrenders the ticket and receipt to ticket booth personnel.
6. Ticket Booth personnel scans ticket and receipt, which verifies ticket and receipt with the server.
7. Server clears Customer for free parking. Ticket Booth Personnel hands back receipt.
8. Customer takes receipt and leaves parking structure/lot.

Ticket System Alternate Flow

5a. Customer surrenders ticket with no sales receipt to ticket booth personnel.

1. Ticket Booth Personnel scans ticket.
2. Ticket Booth Personnel charges Customer $10.00 for parking.
3. Customer pays parking fee and leaves parking structure/lot.

5b. For Employees exiting the parking structure/lot; Employees surrender ticket and provides employee ID or employee parking permit number.

1. Ticket Booth employee scans ticket and ID, or enters parking permit number into system.
2. Server clears employee for free parking. Ticket Booth
3. Personnel returns ID card.
4. Employee leaves parking structure/lot.

Emergency Response Basic Flow

1. Customer activates emergency system via local call box or mobile application.
2. The emergency response system notifies the server and contacts parking patrol.
3. Parking patrol will get in contact with Customer and server will provide patrol with location of emergency and will also notify appropriate parties of emergency (fire, police, poison control, etc.).
4. Parking patrol arrives at Customer and resolves emergency.

Parking Status Basic Flow

1. Parking sensor sends current status to server. (Occupied or Empty)
2. Server updates database with parking information. (Overall empty per level, Empty parking spots, etc.)
3. Parking billboards, mobile application and web portal will retrieve parking information from server.

##### Software Qualities and Non-functional Requirements

The parking management system should run quickly with minimal wait times for users/Customers. A backup system should be implemented in case of server failures. Customer would like the entrance/exit gates to operate within 5 seconds from activation. Parking sensors should also report within 5 seconds from when a car enters or exits a parking spot. As stated earlier, user interface of web portal and mobile application should be easy and quick to use, preferably easy enough to use with one hand on a mobile device.

##### Other Requirements

Glossary of Terms

ABC Inc. – The Company that commissioned the work for this System Requirements document.

Android – Operation System for Google’s mobile devices

Customer – A person who uses and parks their car in the parking structure/lot.

Employee – A paid worker of ABC Inc.

iOS – Operating System for Apple’s mobile devices

Parking Patrol – An employee of ABC Inc. whose role is to provide security and assistance in the parking structure/lot.

Server – The computer that will house the database and do the computations for the parking system.

Ticket Booth Personnel – An employee of ABC Inc. who manages the parking ticket system. The person will be located at the exit of the parking structure/lot.

##### Assumptions / Risks

Financial Risks

* New parking sensors and billboards may be a substantial investment with little return.
* Cost of programmers, servers and other hardware related to the system may be quite costly.

Business Risks

* Customers who do not buy any merchandise will not be happy to pay the parking fee.
* Customers may expect more luxuries and features with paid parking.

Legal and Ethical Risks

* Customer may not like the idea of being monitored, even if it is for security or other helpful benefits.

##### Priorities / Implementation Phases

First phase of the new parking management system will be implemented at the offices. The offices currently have an automated parking system and the new system will continue to be automated at the offices. This will ease the cost of implementing the new system and allow refinements of the new system before it will be incorporated at the busier sales store locations. With the new system in place at the offices first, this will allow us to test the parking status report system, the web portal, and the emergency system features. This will also give us the time to make sure the servers are robust enough to handle the tasks of the parking system and any failures that may occur.

##### Future Directions and Expected Changes

Future changes for the parking system may include:

* Grace Period before charging Customers parking fee
* Mobile application on more/newer mobile operation systems
* Mobile application directing customers to empty parking spots via GPS or similar technology
* Statistical data collection for analysis
* Camera tracking possibly for directing traffic