CS 3610: Software Engineering

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Software Requirements Specification Document

Project Title

Theater Reservation System

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Revision History

Date	Version	Description	Author
12-FEB-14	1.0	Initial Submission	

Table of Contents

Software Requirements Specification

1. Introduction

1.1 Purpose

The Software Requirements Specification (SRS) provides and overview of the Theater Reservation System requirements. The SRS is the foundational document for how the Theater Reservation System will be used, composed, and how each component will communicate with each other component.

1.2 Scope

Theater Reservation Systems are horribly behind today's technological abilities. The films being shown in the theaters are using the latest technologies to grab attention. Theater reservation systems need to make available the speed, accuracy, and ease of use that draw movie goers to films to the reservation systems. The reservation system is the film watcher's first interaction with a film, this initial interaction can contain the same level of technology used in making the films.

//Add more later

biomatric readers, username/password reservations.

1. We can add NFC technology to get tickets from the kiosk.
2. Implement an app that automatically pops up based on location. So if u near the theater it will pop up with suggestions of current movies showing. Of course we can suggest movies based on the history of the what movies the user has watched.
3. Implement in the app discounts/coupons and also first priority to specific seats in the theater.
4. QR codes on the posters at the theater. QR code readers can be in the app letting users view trailers while waiting in line or if they are at the theaters and cant decide what to watch.

1.3 Definitions, Acronyms and Abbreviations

- SRS – Software Requirements Specification
- NFC - Near field communication
- Ecma - International association associated with the standardization of communication systems.
- Biometric – Identification of humans based on their biological uniqueness
- QR code – two dimension bar codes that can contains information or hyperlinks
- ITSC - Information Technology Support Center
- App – programs designed for mobile electronic devices, user authentication is occurs before installation and is persistant
- Kiosk – Free standing terminal that a person can use to access constrained software systems

1.4 References

- ECMA NFC specification - http://www.ecma-international.org/publications/files/ECMA-ST/ECMA-352.pdf
- ITSC QR code specification - www.itsc.org.sg/pdf/synthesis08/Three_QR_Code.pdf

1.5 Overview

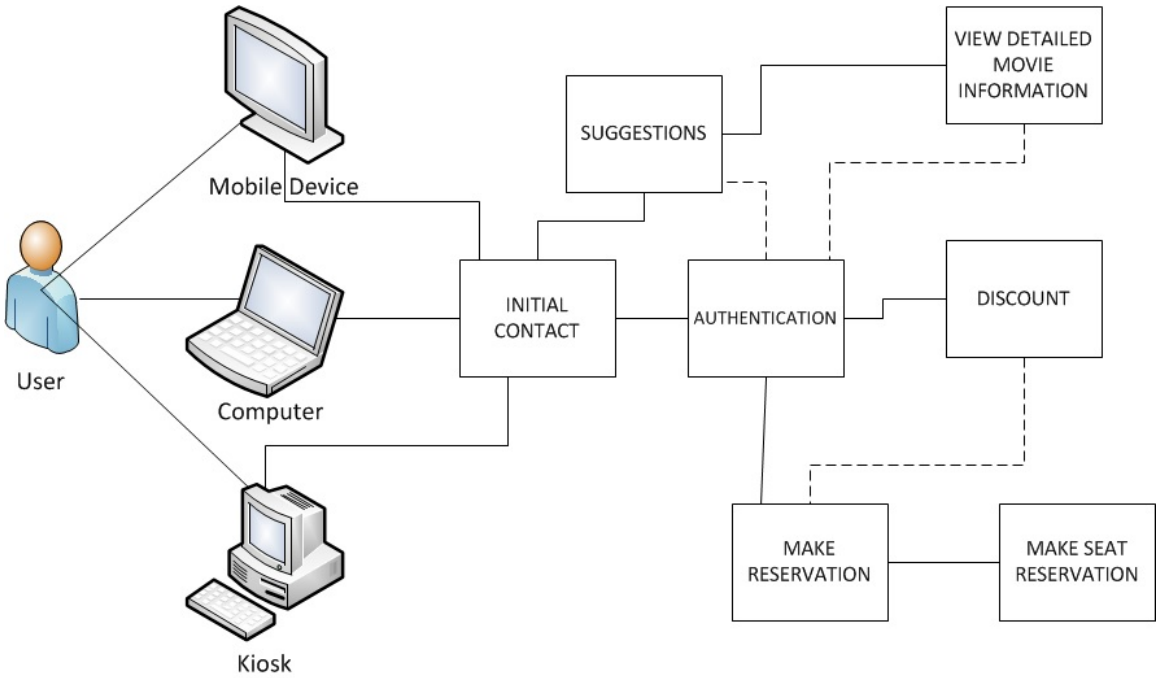
The remaining section of this document will contain the following :

- //subject to change
- Use-Case models
- Specific Requirements
- Supporting Information

2. Overall Project Description

The objective of this project is the development of a web-based theater ticket reservation system for the ABC Entertainment Company. The product will allow customers to create reservations online for specified movie showings at all ABC Entertainment Company Theaters. The product will be accessible through internet-connected computers, tablets, and mobile devices. Customers will have the option to purchase their tickets at the time of reservation. If no purchase is made initially, customers may choose to pick-up tickets at the specified theater's box office. With this option, customers will have until thirty minutes prior to scheduled showtime to claim their reservations in-person at the theater and complete their purchase. If the reservation is not claimed thirty minutes prior to scheduled showtime, the reservation will be canceled and the allotted seats will be released for purchase by the general public. Customers may also choose to complete their purchase for previously reserved seats online and print their tickets at home up to one hour prior to scheduled showtime. If customers choose the print option and do not complete purchase by the specified time, the reservation will be canceled and the seats will be released to the general public.

2.1 Use-Case Model Survey



Use case name: Initial contact	**ID:** 001	**Priority:** High
Primary actor: Unknown user	**Source:** User	**Use case type:** Technical
Interested Stakeholders: Movie Theater		
Brief description: An unknown user opens the app / requests the web site / engages a kiosk. The user is then given the option to authenticate or continue anonymously		
Precondition: App / web site / kiosk is in a ready state		
Trigger: An unknown user opens the app / requests the web site / engages a kiosk		
Relationships: **Include:** 002, 003 **Extends:** None **Depends On:** None		
Typical flow of events: 1. An unknown user opens the app / requests the web site / engages a kiosk 1. The user chooses to authenticate 1. Current flow is terminated and ID 003 is initiated 2. The user chooses to not authenticate 1. Current flow is terminated and ID 002 is initiated		
Assumptions: App / web site / kiosk can connect to the theater server through a secure connection		
Implementation Constraints and Specifications: Apps may be left in an authenticated state. Apps will always have initial contact as the first step, but if the user never logs out, the app stays authenticated.		

Use case name: Suggestions	**ID:** 002	**Priority:** High
Primary actor: Anonymous user	**Source:** User	**Use case type:** Technical
Interested Stakeholders: Movie Theater		
Brief description: Suggestions are generated by the system and displayed to the user		
Precondition: None		
Trigger: User opts to view suggestions		
Relationships: **Include:** 003 **Extends:** None **Depends On:** 001		
Typical flow of events: 1. Suggestions are made based on prior anonymous data collected at that location or user data 1. The location will be relative, multiple kiosks at the same postage address will be considered the same location 2. Mobile location data will be considered the same location if it is within 10 miles 3. Locations will overlap and share relative data 2. User is given the option to view detailed movie information. 3. User is given the option to view more suggestions		
Assumptions: The GUI is designed in a manner that an option to authenticate or make a reservation is always available		
Implementation Constraints and Specifications: The options to authenticate or make a reservation are mutually exclusive		

Use case name: View detailed movie information	**ID:** 003	**Priority:** Low
Primary actor: User	**Source:** User	**Use case type:** Technical

Interested Stakeholders: Movie Theater

Brief description: A user opts to view detailed movie information

Precondition: Suggestions have been shown

Trigger: User clicked on suggestion

Relationships:
- **Include:** None
- **Extends:** 002
- **Depends On:** None

Typical flow of events:

1. The selection of the movie is kept in a database and associated with either the user or location
2. A screen is displayed where
    1. User can authenticate to make a reservation or add a comment
        1. If the user is already authenticated, this option is now to make reservation
    2. User can view suggestions
    3. User can watch movie trailer
    4. User can view movie synopsis
    5. User can view user generated comments
        1. If user is authenticated, user can add comment

Assumptions: The movie details are interesting enough for the user to want to then make a movie reservation

Implementation Constraints and Specifications:
The user may enter an infinite loop of viewing detailed information and suggestions

Use case name: Authentication	**ID:** 004	**Priority:** High
Primary actor: User	**Source:** User	**Use case type:** Technical

Interested Stakeholders: Movie Theater

Brief description: A user will attempt to authenticate with the system

Precondition: User have selected the option to authenticate

Trigger: User has selected the option to authenticate

Relationships:
- **Include:** 001
- **Extends:** 005
- **Depends On:** None

Typical flow of events:

1. Authentication options will be given based on the device used to authenticate
2. User attempts to authenticate
    1. If authentication is unsuccessful
        1. the user is given the option to restart authentication, this will force a new check of environmental variables
        2. The user is given the option to cancel authentication
    2. If authentication is successful
        1. The system checks for a discount
        2. The user is given the option to view suggestions

Assumptions: Every app / computer / kiosk will allow at least user name / password authentication, devices have environmental variables that will be checked at runtime. These environmental variables are handled at the operating system level thus they are abstracted from this software

Implementation Constraints and Specifications:
Mobile devices, computers and kiosk technology is advancing constantly. Every device will have the software available to authenticate with all three methods.

Use case name: Discount	**ID:** 005	**Priority:** Low
Primary actor: User	**Source:** User	**Use case type:** Technical
Interested Stakeholders: Movie Theater		
Brief description: A user is offered a discount		
Precondition: User is authenticated		
Trigger: User authentication		
Relationships: **Include:** None **Extends:** 004 **Depends On:** None		
Typical flow of events: 1. Authentication options will be given based on the device used to authenticate 2. User attempts to authenticate 1. If authentication is unsuccessful 1. the user is given the option to restart authentication, this will force a new check of environmental variables 2. The user is given the option to cancel authentication 2. If authentication is successful 1. The system checks for a discount 2. The user is given the option to view suggestions 3. The user is given the option to make reservation		
Assumptions: Discounts will be offered globally, based on location or based on user		
Implementation Constraints and Specifications: The user is given a discount at one time and must enter the discount at payment time. Payment is outside the scope of this software.		

Use case name: Make reservation	**ID:** 006	**Priority:** High
Primary actor: User	**Source:** User	**Use case type:** Technical
Interested Stakeholders: Movie Theater		
Brief description: A user wants to make a reservation		
Precondition: User is authenticated		
Trigger: User selects the option to make reservation		
Relationships: **Include:** None **Extends:** None **Depends On:** 004		
Typical flow of events: 1. User opts to make a reservation 2. List of movies available are displayed 3. User clicked on movie to reserve 4. User is given option to reserve seat 5. User is given option to view suggestions		
Assumptions: System is secure and working		
Implementation Constraints and Specifications: The list of movies available in theaters is small enough to be displayed.		

Use case name: Make seat reservation	**ID:** 007	**Priority:** Low
Primary actor: User	**Source:** User	**Use case type:** Technical
Interested Stakeholders: Movie Theater		
Brief description: A user wants to make a seat reservation		
Precondition: User has a reservation		
Trigger: User has made reservation and opts to reserve a seat		
Relationships: **Include:** None **Extends:** 006 **Depends On:** None		
Typical flow of events: 1. User opts to make a seat reservation 2. List of seats available are displayed 3. User clicked on seat to reserve 4. User is given option to view suggestions		
Assumptions: There is a seat available		
Implementation Constraints and Specifications: The list of seats available in theaters is small enough to be displayed.		

Use case name: Admin panel	**ID:** 008	**Priority:** Low
Primary actor: Administrator	**Source:** Administrator	**Use case type:** Technical
Interested Stakeholders: Movie Theater		
Brief description: An administrator wants to log on to the administrator panel		
Precondition: None		
Trigger: Administrator connects via the admin terminal		
Relationships: **Include:** 009 **Extends:** None **Depends On:** None		
Typical flow of events: 1. Administrator connect via a secure ssh connection to the administrator panel 2. Administrator panel is command line only 3. The administrator panel authenticates the administrator using only a SHA-256 fingerprint 1. Passwords or any other type of authentication will not be available. 1. Remote connections will only connect with SHA fingerprint 2. Physical access to the server will be securely restricted to authorized personnel 4. Administrator can query the list of all user generated and anonymous generated data 5. Administrator sets up discount trigger		
Assumptions: Physical access to the server is only used to add remote admin access to the server		
Implementation Constraints and Specifications: Physical access to the server is securely restricted		

Use case name: Set discounts		**ID:** 009	**Priority:** Low
Primary actor: Administrator	**Source:** Administrator		**Use case type:** Technical
Interested Stakeholders: Users			
Brief description: An administrator is able to set discount triggers			
Precondition: None			
Trigger: Administrator opens discount interface			
Relationships: **Include:** None **Extends:** 008 **Depends On:** None			
Typical flow of events: 1. Administrator will set discounts based on location or user 2. Location discounts will be be available to every user in a location 3. User discounts will only be extended to groups of users			
Assumptions: Marketing department has given administrator an order for the system to offer discounts			
Implementation Constraints and Specifications: None			

Use case name: Admin queries	**ID:** 010	**Priority:** Low
Primary actor: Administrator	**Source:** Administrator	**Use case type:** Technical
Interested Stakeholders: Marketing department		
Brief description: An administrator can run SQL queries for the marketing department		
Precondition: Administrator is logged on		
Trigger: Administrator enters a SQL query		
Relationships: **Include:** None **Extends:** 008 **Depends On:** None		
Typical flow of events: 1. Administrator enters the SQL command line interface. 2. Administrator runs query 3. Data is returned to the marketing department however it is desired 1. Administrator has the option to verbally return data, generate reports, output CSV files		
Assumptions: Marketing department wants data from the server		
Implementation Constraints and Specifications: The administrator will return raw that to the marketing department. The marketing department is responsible for all data analysis, interpretation and presentation.		

2.2 Assumptions and Dependencies

- The product must be delivered by the deadline.
- The budget cannot be exceeded.
- Customer information must be secured and held to the strictest privacy constraints.
- The product must be easily accessible for all users with an internet-connected device.
- The product must be user-friendly and reliable.
- The product must have forward compatibility.
- App / web site / kiosk can connect to the theater server through a secure connections.
- Apps may be left in an authenticated state. Apps will always have initial contact as the first step, but if the user never logs out, the app stays authenticated.
- The GUI is designed in a manner that an option to authenticate or make a reservation is always available.
- The options to authenticate or make a reservation are mutually exclusive.
- The movie details are interesting enough for the user to want to then make a movie reservation.
- The user may enter an infinite loop of viewing detailed information and suggestions.
- Every app / computer / kiosk will allow at least user name / password authentication, devices have environmental variables that will be checked at run-time. These environmental variables are handled at the operating system level thus they are abstracted from this software.
- Mobile devices, computers and kiosk technology is advancing constantly. Every device will have the software available to authenticate with all three methods.
- Discounts will be offered globally, based on location or based on user.
- The user is given a discount at one time and must enter the discount at payment time. Payment is outside the scope of this software.
- System is secure and working.
- The list of movies available in theaters is small enough to be displayed.

- Physical access to the server is only used to add remote admin access to the server.
- Physical access to the server is securely restricted.
- Marketing department has given administrator an order for the system to offer discounts.
- The marketing department asks for the data in a reasonable manner.
- The administrator will return raw that to the marketing department. The marketing department is responsible for all data analysis, interpretation and presentation.

3. Specific Requirements

[This section of the SRS should contain all the software requirements to a level of detail sufficient to enable designers to design a system to satisfy those requirements, and testers to test that the system satisfies those requirements. When using use-case modeling, these requirements are captured in the use cases and the applicable supplementary specifications. If use-case modeling is not used, the outline for supplementary specifications may be inserted directly into this section.]

3.1 Classes/Objects

Here, insert your conceptual UML class inheritance diagram.

After you conduct your CRC modeling exercise for all use-cases and decided on your potential "analysis" classes, use the following table format to describe these classes.

Class Name: User	
Description: Representation of a user which will contain individual user information required for authentication.	
Attributes (fields)	**Attribute Description**
String Name	Holds name of user
String Address	Holds address of user
String Phone	Holds phone 10-digit phone number of user (allows the entry of hyphens)
String Email	Holds email address of user
Methods (operations)	**Method Description**
Void setName	Sets user name

Void setAddress	Sets user address
Void setPhone	Sets user phone
Void setEmail	Sets user email
String getName	Returns user name
String getAddress	Returns user address
String getPhone	Returns user phone
String getEmail	Returns user emai

Class Name: Theater	
Description: Contains information on a theater	
Attributes (fields)	**Attribute Description**
String TheaterName	Holds the theater name
String TheaterAddress	Holds the theater address
String TheaterZip	Holds the zip code of a theater
String TheaterPhone	Holds the theater phone number
List Movies	Holds the set of all movies showing at the theater on a present or future date
List Showtimes	Holds the set of showtimes of a selected movie on a given date
Date TheaterDate	Holds the date to search within for movies playing in the theater
Methods (operations)	**Method Description**
Public void setTheaterName	Sets theater name
Public void setTheaterAddress	Sets theater address
Public void set TheaterZip	Sets theater zip
Public void setTheaterPhone	Sets theater phone number
Public void addMovie	Adds movie to the theater
Public void removeMovie	Removes movie from the theater
Public List getMovies	Returns the list of all movies at the theater
Public void addShowtime	Adds showtime to a movie at the theater

Public void removeShowtime	Removes showtime to a movie at the theater
Public List getShowtimes	Returns the list of showtimes for a movie at the theater
Public void setDate	Sets date for user to search within
Public Date getDate	Returns the date to search within
Public String getTheaterName	Returns theater name
Public String getTheaterAddress	Returns theater address
Public String getTheaterZip	Returns theater zip
Public String getTheaterPhone	Returns theater phone number

Class Name: Movie	
Description: Contains information on a movie	
Attributes (fields)	**Attribute Description**
String MovieName	Holds the name of the movie
String MovieRating	Holds the MPAA rating of the movie
String MovieLength	Holds the running time of the movie
String MovieRelease	Holds the release date of the movie
String MovieDescription	Hold a brief description of the movie
Methods (operations)	**Method Description**
Public void setMovieName	Sets the name of the movie
Public void setMovieRating	Sets the rating of the movie
Public void setMovieLength	Sets the running time of the movie
Public void setMovieRelease	Sets the release date of the movie
Public void setMovieDescription	Sets the description of the movie
Public String getMovieName	Returns the name of the movie
Public String getMovieRating	Returns the rating of the movie
Public String getMovieLength	Returns the running time of the movie
Public String getMovieRelease	Returns the release date of the movie
Public String getMovieDescription	Returns the description of the movie
Public Theater getTheater	Returns a designated theater

3.2 Object Collaboration Diagrams

Draw a UML object collaboration diagram.

3.3 Sequence Diagrams

Draw a UML sequence diagram for each use-case. The diagram is derived from the "Typical Flow of Event" section of the use-case description table.

3.4 Object Behavior Diagrams

Draw a UML State Transition Diagram for the entire application.

3.5 Performance Requirements

- The kiosk need to be NFC enabled and have biometric reader.
- The database must be secure.
- The database needs to be indexed and cache enabled for faster query rate times
- Scheduled server maintenance must be made in a manner that the server operations are not discrupted.
- The web server must offer SSL for authentication.
- The server must have ample storage space.
- The server must be capable of handling high traffic

3.6 Other Requirements

- The chairs in the theater must be clearly marked.
- The staff will be required to put a card on the seats that become reserved.

4. Supporting Information

[The supporting information makes the SRS easier to use. It includes: a) Index, c) Appendices. These may include use-case storyboard, CRC cards, user-interface prototypes, appendices, index, etc. When appendices are included, the SRS should explicitly state whether or not the appendices are to be considered part of the requirements.]