

# Movie Theatre Ticketer

## Software Requirements Specification

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Group 9

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## Document Approval

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# Table of Contents

REVISION HISTORY.....	II
DOCUMENT APPROVAL.....	II
<b>1. INTRODUCTION.....</b>	<b>1</b>
1.1 PURPOSE.....	1
1.2 SCOPE.....	1
1.3 DEFINITIONS, ACRONYMS, AND ABBREVIATIONS.....	1
1.4 REFERENCES.....	1
1.5 OVERVIEW.....	1
<b>2. GENERAL DESCRIPTION.....</b>	<b>2</b>
2.1 PRODUCT PERSPECTIVE.....	2
2.2 PRODUCT FUNCTIONS.....	2
2.3 USER CHARACTERISTICS.....	2
2.4 GENERAL CONSTRAINTS.....	2
2.5 ASSUMPTIONS AND DEPENDENCIES.....	2
<b>3. SPECIFIC REQUIREMENTS.....</b>	<b>2</b>
3.1 EXTERNAL INTERFACE REQUIREMENTS.....	3
3.1.1 <i>User Interfaces</i> .....	3
3.1.2 <i>Hardware Interfaces</i> .....	3
3.1.3 <i>Software Interfaces</i> .....	3
3.1.4 <i>Communications Interfaces</i> .....	3
3.2 FUNCTIONAL REQUIREMENTS.....	3
3.2.1 <i>&lt;Search for movie&gt;</i> .....	10
3.2.2 <i>&lt;Select movie&gt;</i> .....	10
3.2.3 <i>&lt;Select seating&gt;</i> .....	10
3.2.4 <i>&lt;Purchase tickets&gt;</i> .....	10
3.2.5 <i>&lt;Create account&gt;</i> .....	10
3.2.6 <i>&lt;Checkout as guest&gt;</i> .....	10
3.2.7 <i>&lt;Allow refunds or exchanges&gt;</i> .....	10
3.2.8 <i>&lt;Offer rewards and promotions&gt;</i> .....	11
3.3 USE CASES.....	3
3.3.1 <i>Use Case #1</i> .....	3
3.3.2 <i>Use Case #2</i> .....	3
3.3.3 <i>Use Case #3</i> .....	3
3.4 CLASSES / OBJECTS.....	3
3.4.1 <i>Users</i> .....	3
3.4.2 <i>Administrators</i> .....	3
3.5 NON-FUNCTIONAL REQUIREMENTS.....	4
3.5.1 <i>Performance</i> .....	4
3.5.2 <i>Reliability</i> .....	4
3.5.3 <i>Availability</i> .....	4
3.5.4 <i>Security</i> .....	4
3.5.5 <i>Maintainability</i> .....	4
3.5.6 <i>Portability</i> .....	4
3.6 INVERSE REQUIREMENTS.....	4
3.7 DESIGN CONSTRAINTS.....	4
3.8 LOGICAL DATABASE REQUIREMENTS.....	4
3.9 OTHER REQUIREMENTS.....	4
<b>4. ANALYSIS MODELS.....</b>	<b>4</b>
4.1 SEQUENCE DIAGRAMS.....	5
4.3 DATA FLOW DIAGRAMS (DFD).....	5
4.2 STATE-TRANSITION DIAGRAMS (STD).....	5
<b>5. CHANGE MANAGEMENT PROCESS.....</b>	<b>5</b>

<b>A. APPENDICES.....</b>	<b>5</b>
A.1 APPENDIX 1.....	5
A.2 APPENDIX 2.....	5

## **1. Introduction**

The introduction of the Software Requirements Specification(SRS)<sup>1</sup> provides an overview of the SRS along with the purpose, scope, definitions, acronyms, abbreviations, references, and an overview. The purpose will describe exactly what this SRS document is trying to achieve. The scope will help introduce the software products that are to be used in development, what they will and will not do, as well as a description of the product. The next section is meant to define any acronyms or terms from throughout the document. The references will contain any other texts mentioned in the SRS that need to be cited. Finally the overview will go over the rest of the SRS as well as describe how it will be organized. This document will also heavily rely on the IEEE guide to SRS<sup>1</sup>, see References section. Overall the detailed requirements of the Movie Theatre Ticketer(MTT)<sup>2</sup> system will be contained in this document.

### **1.1 Purpose**

The purpose of this document is to provide a specific goal and description of the product the software customers want. Along with appealing to the customers this document also wishes to help the software suppliers and software designers understand exactly what needs to be designed as well as how they should go about doing it. This SRS hopes to be a clear guide for the clients, developers, and managers to help alleviate any misunderstandings as well as streamline efficiency to result in an amazing finished product as timely as can be done.

### **1.2 Scope**

The MTT is an application designed to allow customers to book, purchase, and manage their movie tickets online. The application will provide an efficient, user-friendly, and secure method for customers to look for movie listings, select times to watch, reserve their seats, and complete payments online with credit card, paypal, zelle, venmo, and bitcoin. The application will allow users to create an account in order to gain loyalty points, save purchase history, and save payment and personal information. The system will also be able to have language support for English, Spanish, Chinese, Vietnamese, Tagalog, and Swedish as they are some of the most popular languages in the US. The MTT will also be accessible via a desktop or mobile device in order to maximize convenience. What our system will NOT include is handling of external transportation or parking nor access to streaming services or downloads through the application. These specifications will be mentioned more in depth later in the SRS.

### **1.3 Definitions, Acronyms, and Abbreviations**

1. Software Requirements Specification (SRS)
2. Movie Theatre Ticketer (MTT)

## 1.4 References

1. [IEEE Recommended Practice for Software Requirements Specifications](#), Developed by the Institute of Electrical and Electronics Engineers, June 25th, 1998

## 1.5 Overview

The rest of the SRS is split into four sections with appendices at the end. Section two will cover a general description of the product including its functions, characteristics, as well as general constraints. Section 3 will provide specific requirements for the application. This includes external interfaces that will be required, functional requirements, two use cases, classes and objects, non-functional requirements, inverse requirements, some design constraints, database requirements, and any other requirements needed. Then the fourth section lists the analysis models that were used in developing any requirements contained in the SRS. Specifically there will be three kinds of models shown, sequence diagrams, data flow diagrams, and state-transition diagrams. Finally the fifth section will cover the change management process which is how exactly the SRS will be updated when needed as requirements change, as well as some details on by who and how they can be changed. There will also be appendices at the end of the SRS which will provide any additional and helpful information about the process and product.

## 2. General Description

This section of the SRS will describe general factors that will affect the product and its requirements. It will not list specific, concrete requirements but rather describe them to make them easier to understand in section 3.

### 2.1 Product Perspective

The SRS will be on par with other online movie ticket vendors such as Fandango and Atom Tickets. Similar to those sites we will have a way for the user to create an account to save their personal information or purchase tickets as a guest. Users will get emailed their tickets and will just have to present the tickets at the door of the theater. The MTT will list movies for the user to pick from and after a selection will prompt the user to select their seat and purchase tickets.

### 2.2 Product Functions

The SRS will be able handle payments of tickets, will have support for the following 6 languages: English, Spanish, Chinese, Vietnamese, Tagalog and Swedish, will convert local currency when purchasing tickets, will keep systemwide daily logs of tickets purchased, allow users to create accounts to store their personal information, accept a variety of payment methods such as credit card and paypal, will allow users to select and reserve tickets for a specific showing, and allow users to refund or exchange tickets.

## **2.3 User Characteristics**

The User characteristics of the Movie Ticketing system described in this SRS are divided into 3 categories, Guest User, User, and Employee. The difference between the three categories is their status within the company. Users in this ticketing system are customers and therefore do not have similar access to Employees. Unlike Guest Users, Users have information already set up within the ticketing system and can therefore be prompted differently. In this SRS Guest Users do not have this type of information stored within the system and must be prompted differently likewise. Employees are separated from guests in their authority and access in the company. Employees are managers of the website and of the customers and must have the authority to edit or access information and bookings as needed.

## **2.4 General Constraints**

This subsection of the SRS will provide a general description of any items that will limit the developers options for designing the system:

- a) Regulator policies;
- b) Hardware limitations;
- c) Interfaces to other applications;
- d) Parallel operation;
- e) Audit functions;
- f) Control Functions;
- g) Higher-order language requirements;
- h) Signal handshake protocols;
- i) Reliability requirements;
- j) Criticality of the application;
- k) Safety and security considerations

## **2.5 Assumptions and Dependencies**

The system according to this SRS and its goals will depend upon the hardware of the customer's device whether it be handheld, or grounded. The system will depend upon a contractual agreement between the company and an internet service provider. This system will assume a website location and address has been developed and claimed by the company. The system will depend and assume the customer has direct access to the internet through the customers own means. The system will depend and assume on the employees and customer service access to the internet of their own accord or through the company. The system depends on and assumes the program has access to servers which can be used by the software. The system assumes there are third party payment connectors with valid and working payment systems that the system can access. The system assumes that movie listings, schedules, and pricing will be provided by theaters or a centralized database with timely updates. The system depends on external email and SMS services for sending ticket confirmations and notifications. The system assumes that users have devices capable of running modern web applications and supporting necessary security protocols. The system assumes compliance with data privacy regulations and industry standards for online transactions. The system assumes that users access the website through a supported

web browser. The system assumes that a customer support team will be available to handle disputes, refunds, or account issues.

### **3. Specific Requirements**

*This will be the largest and most important section of the SRS. The customer requirements will be embodied within Section 2, but this section will give the D-requirements that are used to guide the project's software design, implementation, and testing.*

*Each requirement in this section should be:*

- *Correct*
- *Traceable (both forward and backward to prior/future artifacts)*
- *Unambiguous*
- *Verifiable (i.e., testable)*
- *Prioritized (with respect to importance and/or stability)*
- *Complete*
- *Consistent*
- *Uniquely identifiable (usually via numbering like 3.4.5.6)*

*Attention should be paid to the carefully organize the requirements presented in this section so that they may easily accessed and understood. Furthermore, this SRS is not the software design document, therefore one should avoid the tendency to over-constrain (and therefore design) the software project within this SRS.*

### **3.1 External Interface Requirements**

#### **3.1.1 User Interfaces**

This System will provide a uniform and well blended look.

This System will have a readable and easily navigable menu.

This System will have pictures and text for each film or event.

This System will incorporate the use of icons and toolbars.

#### **3.1.2 Hardware Interfaces**

Since the application must run over the internet, all the hardware shall require to connect internet will be hardware interface for the system. As for e.g. Modem, WAN – LAN, Ethernet Cross-Cable.

### **3.1.3 Software Interfaces**

1. The checkout system shall communicate with the Configurator to identify all the available components to configure the product.
2. The checkout system shall communicate with the content manager to get the product specifications, offerings and promotions.
3. The checkout system shall communicate with multiple third party payment systems to identify available payment methods , validate the payments and process payment.
4. The checkout system shall communicate with a customer support system to provide support.
5. The checkout system shall communicate with Sales system for order management.
6. The checkout system shall communicate with an sms system to text and email customers.
7. The checkout system shall communicate with external Tax system to calculate tax.
8. The checkout system shall communicate with export regulation system to validate export regulations.
9. The system shall be partnered with a security system to ensure safe payments.
10. The system shall work with an AI detection system to prevent overbooking and fake sales.
11. The booking and content system will work with theatre systems directly to edit, add, delete, and change times or content on their locations interface.

### **3.1.4 Communications Interfaces**

The system will utilize electronic forms to communicate with customers for booking reservations and customer support.

The system will send confirmation emails for ticket purchases, refunds, and account-related notifications.

The system may send customers SMS alerts for booking confirmations, reminders, or urgent updates.

The system will communicate with third-party payment processors and movie databases via secure API calls.

Users can submit support requests through an integrated help desk or email-based ticketing system.

## **3.2 Functional Requirements**

*This section describes specific features of the software project. If desired, some requirements may be specified in the use-case format and listed in the Use Cases Section.*



### **3.2.1 <Search for movie>**

- 3.2.1.1 The System shall allow searching for a specific movie
- 3.2.1.2 The system shall allow the user to select a movie
- 3.2.1.3 The system shall take the user to a new page after a movie is selected
- 3.2.1.4 The system shall notify the user about any problems

### **3.2.2 <Select movie>**

- 3.2.1.1 The system shall display all movies available to be seen
- 3.2.1.2 The system shall allow the user to select a movie
- 3.2.1.3 The system shall take the user to a new page after a movie is selected
- 3.2.1.4 The system shall notify the user about any problems

### **3.2.3 <Select seating>**

- 3.2.1.1 The system shall will display all available seats
- 3.2.1.2 The system shall allow the user to select up to 20 seats
- 3.2.1.3 The system shall take the user to a new page after a movie is selected
- 3.2.1.4 The system shall produce an error message if seat is already taken

### **3.2.4 <Purchase tickets>**

- 3.2.1.1 The system shall allow the user to purchase tickets
- 3.2.1.2 The system shall take the users payment method to purchase the tickets
- 3.2.1.3 The processing will differ depending on payment type
- 3.2.1.4 The system will display a confirmation if successful
- 3.2.1.5 The system shall display an error if payment does not succeed

### **3.2.5 <Create account>**

- 3.2.1.1 The system shall allow the user to create an account
- 3.2.1.2 The system will take in the users personal information
- 3.2.1.3 The system shall send the information to a server to be saved
- 3.2.1.4 The system shall display a confirmation and keep user signed in if successful
- 3.2.1.5 The system shall display an error if account could not be created

### **3.2.6 <Checkout as guest>**

- 3.2.1.1 The system shall allow the user to purchase tickets without an account
- 3.2.1.2 The system shall take the user's name, email, and payment method
- 3.2.1.3 The system shall store the information for a period of time after the movie showing
- 3.2.1.4 The system shall display a confirmation if tickets were successfully purchased
- 3.2.1.5 The system shall display an error if there is an error

### **3.2.7 <Allow refunds or exchanges>**

- 3.2.1.1 The system shall display an tickets eligible for refunds or exchanges
- 3.2.1.2 The system shall allow the user to select any tickets available for refunds or exchanges
- 3.2.1.3 The system shall will a confirmation if the ticket was successfully refunded or exchanged
- 3.2.1.4 The system shall display an error if ticket could not be refunded or exchanged

### **3.2.8 <Offer rewards and promotions>**

- 3.2.1.1 The system shall display all available promotions to the user

3.2.1.2 The system shall allow the user to select any available promotion

### **3.3 Use Cases**

This section will outline multiple use cases, basically a user's interaction with the application accomplishing a certain goal.

#### **3.3.1 Use Case #1, Normal Use Case, Trying to buy a ticket**

The user will enter the application and search for their movie by navigating to the search bar. After finding their desired movie they will click the sign in button and put in their username and password to log into their account. The user will then continue by clicking the chosen movie to select a showing time and theatre they wish to watch at. They will see the availability and choose the number of available seats they want. Then they will be able to apply any rewards or gift cards to their purchase. Finally they will pay with their chosen payment method(credit card, paypal, zelle, venmo, or bitcoin) and get an email confirmation containing their QR code of their tickets as well as their new amount of loyalty rewards points.

#### **3.3.2 Use Case #2, Using Loyalty Rewards, Trying to buy tickets with reward points**

The user will have received an email after their last purchase notifying them that they have earned enough loyalty points to cover a free ticket. The user will then click a link in the email that will take them to the application sign in page where they will enter their username and password. They will then navigate to the movie they want to watch by searching for it. After finding it they will select their desired showtime and theatre. Then they will choose their seat from the available ones and move onto the payment section. This will be the section where they can apply their loyalty rewards which will make the ticket be free. Finally they will confirm their payment and receive an email confirmation containing their QR code ticket and new value of their loyalty rewards points.

#### **3.3.3 Use Case #3, Returning a Ticket, Returning a ticket by logging into their account**

The user has their email confirmation of their ticket but realizes they are actually busy that day and decide they want to return a ticket. Thankfully they have an account so they navigate to the application and click the sign in button. They then are prompted to enter their username and password to enter their account. After signing in they navigate to their profile where they can see the tickets they have purchased. They go to their most recent ticket which they wish to return and click the ticket. There is then an option on the ticket to return the ticket. They decide they want to return it and click the button. They are then prompted if they want to be refunded or want loyalty points in equal value to their ticket. They decide they want to be refunded on their credit card so they select the refund option. Their payment information is saved so they just select confirm and they then receive the money refunded into their account as well as a confirmation email stating the amount refunded.

### **3.4 Classes / Objects**

#### **3.4.1 Users**

The customers who want to buy tickets using our application.

#### 3.4.1.1 Attributes

The username of their account.

The password of their account.

The profile picture of their account.

Loyalty point amount.

Payment information.

Personal information.

#### 3.4.1.2 Functions

Searching and looking for movies on application.

Viewing seats and prices on application.

Purchasing seats with different payment methods.

Refunding tickets for loyalty points or money.

Receiving confirmation emails containing QR tickets for movies as shown in use cases.

### 3.4.2 Administrator

The workers at the theatre who have authorization to edit the system.

#### 3.4.2.1 Attributes

The username of their account.

The password of their account.

Theatre they belong to.

Employee level.

#### 3.4.2.2 Functions

Editing prices for their theatre tickets.

Editing seat availability for movies.

Editing movies that are being shown in their theatre

Allowed to issue refunds to any user

## 3.5 Non-Functional Requirements

*Non-functional requirements may exist for the following attributes. Often these requirements must be achieved at a system-wide level rather than at a unit level. State the requirements in the following sections in measurable terms (e.g., 95% of transaction shall be processed in less than a second, system downtime may not exceed 1 minute per day, > 30 day MTBF value, etc).*

### 3.5.1 Performance

- a) The system should be quick to respond to user input; <1 second
- b) The system shall be able to handle many transactions quickly; 1000 per second
- c) The system shall be able to be upgraded to handle more users and increasingly heavier traffic
- d) System downtime may not exceed 1 minute per day unless there is emergency or scheduled maintenance

### **3.5.2 Reliability**

- a) The system should process payments clearly and efficiently.
- b) The system should provide payment confirmation and booking confirmation.
- c) The system should provide ticket access and any information regarding an order within the website.
- d) The system should display ticket data and order data to employees.
- e) The system shall provide storage of all databases on redundant computers with automatic switchover.
- f) The system shall provide for replication of databases to off-site storage locations.

### **3.5.3 Availability**

- a) The system should be available to anyone with an internet connection and a browser

### **3.5.4 Security**

- a) The system shall perform authentication when a user tries to sign in
- b) The system shall encrypt user data to prevent security breaches

### **3.5.5 Maintainability**

- a) The system must be edited with new data for movie listings or events daily.
- b) The system must be updated per order or edit for each booking.
- c) The system must be updated on new Interface designs or system bugs.

### **3.5.6 Portability**

- a) The system shall be available on mobile devices and on computer

## **3.6 Inverse Requirements**

*State any \*useful\* inverse requirements.*

## **3.7 Design Constraints**

*Specify design constraints imposed by other standards, company policies, hardware limitation, etc. that will impact this software project.*

## **3.8 Logical Database Requirements**

*Will a database be used? If so, what logical requirements exist for data formats, storage capabilities, data retention, data integrity, etc.*

## **3.9 Other Requirements**

*Catchall section for any additional requirements.*

## **4. Analysis Models**

*List all analysis models used in developing specific requirements previously given in this SRS. Each model should include an introduction and a narrative description. Furthermore, each model should be traceable the SRS's requirements.*

## **4.1 Sequence Diagrams**

## **4.3 Data Flow Diagrams (DFD)**

## **4.2 State-Transition Diagrams (STD)**

# **5. Change Management Process**

*Identify and describe the process that will be used to update the SRS, as needed, when project scope or requirements change. Who can submit changes and by what means, and how will these changes be approved.*

## **A. Appendices**

*Appendices may be used to provide additional (and hopefully helpful) information. If present, the SRS should explicitly state whether the information contained within an appendix is to be considered as a part of the SRS's overall set of requirements.*

*Example Appendices could include (initial) conceptual documents for the software project, marketing materials, minutes of meetings with the customer(s), etc.*

### **A.1 Appendix 1**

### **A.2 Appendix 2**