

# Theater Ticketing System



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## Document Approval

The following Software Requirements Specification has been accepted and approved by the following:

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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;Functional Requirement or Feature #1&gt;</i> .....	3
3.2.2 <i>&lt;Functional Requirement or Feature #2&gt;</i> .....	3
3.3 USE CASES.....	3
3.3.1 <i>Use Case #1</i> .....	3
3.3.2 <i>Use Case #2</i> .....	3
3.4 CLASSES / OBJECTS.....	3
3.4.1 <i>&lt;Class / Object #1&gt;</i> .....	3
3.4.2 <i>&lt;Class / Object #2&gt;</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 Theater Ticketing System is a comprehensive software solution aimed at facilitating ticket booking for multiple theaters within the San Diego theater chain. This document outlines the functional and non-functional requirements for the system's development.*

## 1.1 Purpose

*The primary aim of this SRS is to furnish a comprehensive and well-organized delineation of the Theater Ticketing System's requisites. It functions as a point of reference for the development team and stakeholders, fostering a shared comprehension of the project's extent and aims*

## 1.2 Scope

### 1.2.1 Software Product(s)

- *The Theater Ticketing System*

### 1.2.2 Description

- *The Theater Ticketing System allows customers to book tickets online and using an in-person digital kiosk.*
- *Customers can book multiple tickets within San Diego's theater chain.*
- *The Theater Ticketing System will allow users to select multiple languages to include English, Spanish, and Swedish.*
- *Up to a 10 million user load will be supported by the system*
- *Users can receive their tickets digitally and/or physically through a printable copy.*
- *Security measures will be enforced to prevent*

### 1.2.3 Application

- *The Theater Ticketing System will be used by customers that visit theaters all across San Diego in order to book tickets.*

### 1.2.4 Objectives

- *To provide a user-friendly interface for customers to book tickets.*
- *Allow for multiple languages to cater to a wide-range of customers*
- *Create unique ticket identification numbers to prevent fraud*
- *Handle a large amount of customers simultaneously to prevent the system crashing*

## 1.3 Definitions, Acronyms, and Abbreviations

*This subsection should provide the definitions of all terms, acronyms, and abbreviations required to properly interpret the SRS. This information may be provided by reference to one or more appendixes in the SRS or by reference to other documents.*

## 1.4 References

*This subsection should:*

- (1) *Provide a complete list of all documents referenced elsewhere in the SRS, or in a separate, specified document.*

- (2) *Identify each document by title, report number - if applicable - date, and publishing organization.*
- (3) *Specify the sources from which the references can be obtained.*
- This information may be provided by reference to an appendix or to another document.*

## 1.5 Overview

### 1.5.1 Content

- The following sections of this Software Requirements Specification (SRS) will delve into the Theater Ticketing System's functional and non-functional needs. It will cover distinct use cases, describe user interactions and system interactions, outline the data the system retains, and enumerate the system's anticipated constraints and obligations. Additionally, the SRS will touch upon any presumptions and dependencies that might affect the system's design and functioning.

### 1.5.1.2 SRS Organization

- **Section 2. General Description**
- **Section 3. Specific Requirements**
- **Section 4. Analysis Models**
- **Section 5. Change Management Process**
- **Appendices**

## 2. General Description

*The Theater Ticketing System is a software development tool designed to transform the theatergoing experience for the San Diego theater chain's audience. As the trend toward digital solutions continues to grow, there's an imperative for a system that addresses the diverse needs of theatergoers while streamlining operations for theater administrators.*

### 2.1 Product Perspective

*The Theater Ticketing System is an independent product that should be used for integration with existing systems in theaters*

### 2.2 Product Functions

- *The Theater Ticketing System allows for booking tickets, processing payments, and providing a digital or physical copy of the ticket.*
- *Customers will be able to create accounts and partake in a loyalty program.*
- *Users are able to select specific seats during their reservations*
- *Customers are allowed to use a variety of payment methods to include PayPal, Debit Card, Credit Card, and CryptoCurrency.*

### 2.3 User Characteristics

*The system provides a user-friendly experience to in-person and online customers that is not dependent on having a technical background.*

### 2.4 General Constraints

- *The Theater Ticketing System must be able to handle 10 million users simultaneously*

- *There must be security measures in place to prevent theft and fraudulent activity*

## **2.5 Assumptions and Dependencies**

*This section delineates the assumptions and dependencies that have the potential to influence the requirements detailed in this SRS. These elements denote external conditions or alterations that could have an impact on the design and operation of the Theater Ticketing System. Diligent attention to these assumptions and dependencies is imperative to ensure the effective development and deployment of the system.*

### *2.5.1 Assumptions*

- We assume that the designated hardware for the software product will be equipped with the necessary operating system. Any variance from this assumption may require modifications to the SRS
- It is presupposed in this SRS that external payment services, including credit card processors, PayPal, and Bitcoin gateways, will persist in their availability and functionality throughout the system's operational phase.
- The assumption made within this SRS is that internet connectivity will be consistently accessible for online users. Any constraints or interruptions in internet access could potentially impact the system's usability.

### *2.5.2 Dependencies*

- The Theater Ticketing System is dependent on third-party APIs for tasks such as currency conversion and retrieval of online review data. Any alterations or interruptions in the functioning of these APIs have the potential to influence the system's performance.
- The hardware specifications associated with devices utilized within the theater environment, encompassing digital kiosks, serve as critical dependencies. Any alterations or enhancements to these hardware specifications may necessitate corresponding adjustments within the system
- The functionality of the Theater Ticketing System hinges on the continued availability and optimal performance of the designated database, which stores information related to showtimes, ticket availability, and customer data. Any challenges related to the database's availability can impact the system's operation.
- The operational functionality of the system is contingent upon adherence to pertinent legal regulations, including those governing data privacy and industry standards. Revisions to these regulatory frameworks may obligate modifications to the system to ensure ongoing compliance.

### 3. Specific Requirements

*This section outlines detailed specifications for the Theater Ticketing System, driven by customer needs in Section 2. These requirements ensure a correct system design, testability, and user satisfaction without overly restricting development. Organized into subsections, they cover external interfaces, functionality, non-functional aspects, and constraints, facilitating effective communication between stakeholders and the development team.*

#### 3.1 External Interface Requirements

##### 3.1.1 User Interfaces

###### 3.1.1.1 Ticket Selection Interface

- The Ticket Selection User Interface must allow customers to accurately select movie tickets.
- This requirement is tied to the customer's need for interacting with ticketing features, as outlined in Section 2
- Present movie options, showtimes, and ticket prices in a clear and straightforward manner
- Ensure that customers can successfully choose tickets for their preferred movie and showtime.
- This function holds high priority and is fundamental for customer satisfaction, increasing sales, and to reduce cart abandonment rates.
- Provide options for selecting both regular and deluxe tickets, along with seat preferences.
- Maintain uniformity through consistent layout and user interactions across all theaters in San Diego.

###### 3.1.1.2 Transaction Processing Interface

- The Transaction Processing Interface must accurately and securely process customer payments for selected tickets.
- This requirement is aligned with the necessity for customers to securely complete payment transactions, as specified in Section 2.
- Clearly present payment options, including credit card, PayPal, and Cryptocurrency, to customers in an unambiguous manner.
- Implement secure and dependable payment processing mechanisms to confirm the successful completion of customer transactions.
- This requirement holds a high priority as it is fundamental for the successful completion of ticket purchases.
- The interface should enable customers to review their ticket selections, apply discounts, and confirm their purchase before initiating the transaction
- Maintain a consistent payment processing flow across all theaters within the system to ensure a consistent user experience.

###### 3.1.1.3 Booking Confirmation Interface



- The Booking Confirmation Interface must precisely confirm customer reservations, including movie selection, showtime, and seat assignments.
- This requirement is in sync with the customer's need for clear and dependable booking confirmations, as outlined in Section 2.
- Present booking confirmations to customers in a format that is easily comprehensible, including essential details such as booking date and time, movie title, showtime, and seat information.
- Implement mechanisms to consistently and reliably deliver booking confirmations to customers following successful reservations.
- This is a top-priority requirement as it directly influences the customer's experience and provides them with confidence in their reservation.
- The interface should encompass all pertinent booking details and instructions for customers, ensuring they have a comprehensive grasp of their reservation
- Maintain a consistent process for booking confirmations across all theaters within the system to guarantee a standardized and dependable user experience.

#### *3.1.1.4 Account Registration Interface*

- The Account Registration Interface must precisely and securely collect customer information during the registration process, encompassing personal details and contact information.
- This requirement is in sync with the customer's need to establish user accounts, as elaborated in Section 2, enabling them to unlock personalized features and advantages.
- Present the registration process in an intuitive and transparent manner, guiding customers through each step to input the required information.
- Implement verification procedures, such as email confirmation, to validate the authenticity of newly registered accounts.
- This is a top-priority requirement, as it lays the groundwork for customer interaction and the delivery of personalized services within the system.
- The interface should collect all pertinent customer details, including name, email, and password, to create a comprehensive user account.
- Maintain a consistent account registration process across all theaters within the system, ensuring a standardized and dependable user experience.

### **3.1.2 Hardware Interfaces**

#### *3.1.2.1 Digital Kiosks Interface*

- Ensure the Theater Ticketing System operates seamlessly with theater-installed digital kiosks, enabling customers to purchase tickets and access system features in person with precision.
- Maintain a uniform and dependable user experience across all digital kiosks, aligning with customer expectations for reliable in-person ticket transactions.

- Design the digital kiosk interface to be clear and intuitive, simplifying the ticket purchasing process for customers.
- Implement mechanisms for verifying successful ticket transactions through digital kiosks, instilling confidence in customers.
- Given the critical role of digital kiosks in in-person ticket purchases, this requirement holds a top priority.
- Ensure that digital kiosks offer a complete range of ticket options, including regular and deluxe tickets, to cater to customers' preferences

#### *3.1.2.2 Theater Hardware Interface*

- Guarantee the compatibility and precision of the Theater Ticketing System with theater-specific hardware components, including ticket printers and scanners. This ensures accurate ticket validation and access control.
- This requirement aligns with the necessity for customers to have confidence in the precision and reliability of hardware interactions during movie screenings.
- Design theater hardware interfaces to facilitate clear and efficient ticket validation, elevating the overall customer experience.
- Implement mechanisms to confirm the successful validation of tickets using theater-specific hardware, ensuring seamless access to movie screenings.
- Given the pivotal role of precise hardware interactions in delivering a seamless theater experience, this requirement holds paramount importance.
- Theater hardware interfaces must encompass all facets of ticket validation and access control, eliminating any room for ambiguity
- Maintain a uniform process for hardware interactions across all theaters within the system, ensuring a standardized and reliable customer experience

#### *3.1.2.3 Mobile Devices Interface*

- Ensure customers can securely and accurately access the Theater Ticketing System via their mobile devices, such as smartphones and tablets. This includes delivering a responsive and user-friendly experience across different mobile platforms.
- This requirement corresponds to the need for customers to enjoy consistent and dependable access to the system's features through their mobile devices
- Design the mobile device interface to be clear and user-friendly, facilitating easy navigation and utilization for customers.
- Implement mechanisms for verifying successful ticket transactions and interactions on mobile devices, instilling customer confidence in their bookings.
- Given the paramount importance of mobile accessibility in modern ticketing systems, this requirement holds a high priority.
- Mobile interfaces should encompass all relevant features and functions available on other platforms, delivering customers a comprehensive experience
- Maintain a uniform user interface and functionality across various mobile platforms, ensuring consistency and reliability.

#### *3.1.2.4 Box Office Hardware Interface*

- Ensure the Theater Ticketing System harmonizes seamlessly with box office hardware, including point-of-sale systems. This enables precise in-person ticket sales and efficient refunds by theater staff.
- This requirement corresponds to the need for customers to trust the accuracy and reliability of box office transactions
- Design the box office hardware interface to facilitate transparent and efficient ticket transactions, streamlining the in-person ticketing process
- Implement mechanisms for confirming the successful completion of box office transactions, instilling customer confidence during in-person interactions.
- Given the vital role of box office interactions in customer service and in-person ticketing, this requirement holds a high priority
- The box office hardware interface must encompass all aspects of ticket sales, refunds, and customer service, leaving no functional gaps.
- Maintain a consistent process for in-person ticket transactions and customer service across all theaters within the system, ensuring a standardized and reliable experience.

### **3.1.3 Software Interfaces**

#### *3.1.3.1 Database Integration Interface*

- The system should seamlessly interact with the database to retrieve and update information related to showtimes, ticket availability, customer profiles, and other relevant data. This integration must prioritize data accuracy, integrity, and security.

#### *3.1.3.2 Payment Integration Interface*

- The system should establish interfaces with external payment services, including credit card processors, PayPal, and Bitcoin gateways, to ensure the secure processing of customer payments for ticket purchases. These interfaces must prioritize the correctness and security of financial transactions.

#### *3.1.3.3 Third Party API Interface*

- The system's functionality relies on the integration and maintenance of third-party APIs, which are essential for tasks such as currency conversion and retrieval of online movie reviews from reputable sources. These integrations must uphold the accuracy of currency conversion and access to reliable movie reviews.

#### *3.1.3.4 Loyalty Program Management Interface*

- For customers enrolled in loyalty programs, such as the AMC membership card, the system should offer an interface to efficiently manage and validate membership accounts. This feature allows users to seamlessly access reserved tickets and associated benefits

### **3.1.4 Communications Interfaces**

#### ***3.1.4.1 Email Communication Interface***

- Ensure that the information contained in the emails, such as booking confirmations and updates, is factually accurate and error-free. Any inaccuracies could lead to confusion and dissatisfaction among customers.
- Establish a clear link between each email and the specific actions or interactions of the customer. This ensures that the system can track which events triggered the emails and helps with auditing and customer support.
- Craft the email content in a way that is easy to understand and visually pleasing. Use clear language, formatting, and design to enhance readability and comprehension.
- Implement mechanisms to verify that the emails are not only sent but also successfully delivered to the intended recipients. This confirmation ensures that customers receive the information they need.
- Prioritize the sending of emails based on their relevance and timeliness. For instance, booking confirmations should take precedence over general promotional emails.
- Include all the necessary types of emails that customers may expect, such as booking confirmations, updates on ticket availability, and promotional offers.
- Maintain a consistent style and format for emails across all theaters within the system. This uniformity ensures that customers have a standardized and reliable email experience

#### ***3.1.4.2 In-App Notifications Interface***

- Ensure that the content of in-app notifications, such as updates on new movie releases or loyalty program benefits, is accurate and up-to-date. Misinformation can lead to user confusion.
- Associate each in-app notification with the specific user actions or system events that triggered them. This tracking helps users understand why they received a particular notification.
- Design the in-app notifications to be visually clear and concise, so users can quickly grasp their meaning and take appropriate actions if necessary.
- Implement mechanisms to verify that in-app notifications are not only sent but also properly displayed to users. This confirmation ensures that users receive and see the notifications.
- Prioritize the delivery of in-app notifications based on their relevance and urgency. For example, time-sensitive updates should be displayed promptly.
- Ensure that all relevant types of notifications, such as movie release updates or loyalty program alerts, are covered to provide users with a comprehensive experience.
- Maintain a consistent design and functionality for in-app notifications across various mobile platforms. This consistency ensures that users have a uniform and dependable experience regardless of the device they use

#### ***3.1.4.3 Customer Support Interface***

- Provide customers with accurate and reliable support responses to address their inquiries and concerns. Incorrect or misleading information can lead to dissatisfaction
- Establish a clear connection between customer support interactions and the specific inquiries or issues raised by customers. This traceability helps in tracking and resolving customer concerns effectively
- Communicate with customers in a clear and understandable manner to facilitate issue resolution and enhance the overall support experience.
- Implement mechanisms to verify that customer support requests are addressed and resolved satisfactorily. This verification ensures that customers receive the assistance they need
- Prioritize responsive and effective customer support to ensure that customers' inquiries and issues are handled promptly and professionally.
- Cover all necessary communication channels for customer support, such as live chat and email, to accommodate various customer preferences and needs
- Maintain a consistent approach to customer support interactions across all theaters within the system. This consistency ensures that customers receive a standardized and reliable level of support

#### *3.1.4.4 Admin Notification Interface*

- Deliver accurate and reliable admin notifications regarding system events and issues. Admins rely on these notifications to make informed decisions
- Establish clear links between admin notifications and the specific system conditions or activities that triggered them. This traceability aids in diagnosing and addressing system-related issues effectively
- Present admin notifications in a clear and actionable manner to enable administrators to take prompt and appropriate actions in response to the notifications.
- Implement mechanisms to verify that admin notifications are not only sent but also acknowledged and acted upon. This verification ensures that system administrators receive and act on important notifications.
- Prioritize the delivery of admin notifications based on their urgency and relevance to system monitoring and issue resolution
- Ensure that all relevant system events and issues are covered by admin notifications to provide administrators with a comprehensive overview of system health
- Maintain a consistent approach to presenting admin notifications across all theaters within the system. This consistency ensures that administrators have a standardized and dependable experience when monitoring the system

## **3.2 Functional Requirements**

*This section delineates precise features and functionalities that are imperative for the Theater Ticketing System's design, development, and testing processes. These functional requirements*

*offer a comprehensive understanding of the system's objectives in delivering effective solutions to meet customer demands*

### **3.2.1 User-Friendly Interfaces**

#### *3.2.1.1 Introduction*

- This functional requirement centers on shaping the user interface of the Theater Ticketing System. The paramount objective is to ensure that the system is easy for customers to engage with, facilitating actions such as searching for movies, verifying showtimes, selecting seats, and completing ticket purchases. Establishing a user-friendly interface is pivotal in laying the foundation for a positive user experience, which in turn is vital for both customer satisfaction and the overall success of the system.

#### *3.2.1.2 Inputs*

- User inputs encompass the information and actions provided by users during their interactions with the system. Within the context of user-friendly interfaces, this encompasses user activities like choosing a movie, specifying a showtime, indicating seating preferences, and entering payment details. It is imperative to design input methods that are instinctive, appropriately labeled, and responsive to user actions to minimize errors and alleviate any potential frustrations

#### *3.2.1.3 Processing*

- Processing refers to the system's handling of user inputs and requests. In the context of user-friendly interfaces, streamlined processing is critical in providing users with swift responses and seamless interactions. For instance, when a user selects seats, the system should swiftly update seat availability and pricing information. Effective processing contributes significantly to a polished and responsive interface

#### *3.2.1.4 Outputs*

- Outputs encompass the information and feedback that the system provides to users. In user-friendly interfaces, outputs should offer clear and concise information about movie choices, showtimes, ticket pricing, seat availability, and booking confirmations. The presentation of this information should be visually appealing, well-organized, and readily comprehensible to users

#### *3.2.1.5 Error Handling*

- Error handling is an indispensable component for addressing any issues or missteps that users might encounter while using the interface. User-friendly interfaces should incorporate informative error messages and notifications that are specific, guiding users on the necessary steps to rectify the error. Effective error resolution not only prevents user frustration but also helps users navigate the system with ease.

### **3.2.2 Secure Payment Processing**

#### *3.2.1.1 Introduction*

- This functional requirement centers on the paramount task of upholding the security of payment processing within the Theater Ticketing System. It is of utmost importance to protect sensitive financial information and transactions, as this is crucial for earning and retaining the trust of customers. The assurance of secure payment processing serves as a bulwark for safeguarding customer data and thwarting any fraudulent activities.

#### *3.2.1.2 Inputs*

- Inputs, within the realm of secure payment processing, encompass the sensitive information that users furnish during transactions. This includes details such as credit card credentials, PayPal account particulars, or information related to Bitcoin wallets. The stipulation here is to establish secure channels through which users can input this information, ensuring robust encryption and shielding it from any unauthorized access

#### *3.2.1.3 Processing*

- Processing pertains to how the system manages payment information. To ensure secure payment processing, it is imperative to implement robust encryption protocols and adhere to industry security standards (e.g., PCI DSS for credit card transactions). Processing must guarantee that payment data is securely conveyed to payment gateways, meticulously verified for accuracy, and processed without exposure to potential threats

#### *3.2.1.4 Outputs*

- Outputs, in this context, denote the outcomes of payment processing. This encompasses confirmation messages for successful transactions and the receipts that customers receive. In the realm of secure payment processing, it is imperative that these outputs are generated and disseminated securely to customers, preserving the sanctity of their payment details in the process.

#### *3.2.1.5 Error Handling*

- Error handling assumes a critical role in the domain of secure payment processing, particularly for addressing complications that may arise during transactions. These scenarios may involve declined payments or payment processing failures. Effective error handling should guarantee that sensitive payment data remains concealed within error messages and that users are provided with lucid instructions on how to securely rectify any issues that may surface

### **3.2.3 Reservation and Booking System**

#### *3.2.1.1 Introduction*

- The Ticket Reservation and Booking System constitute a critical module within the Theater Ticketing System. Its primary function is to facilitate the seamless acquisition of movie tickets, enabling customers to efficiently plan and secure their theater visits

#### *3.2.1.2 Inputs*

- Within the realm of this system, user inputs serve as the keystones of customer interactions. Customers submit information encompassing movie selections, showtimes, seat preferences, and any applicable promotional codes or discounts. The system's responsibility is to adeptly parse and process these inputs, ensuring the facilitation of booking transactions with precision

#### *3.2.1.3 Processing*

- This aspect involves the intricate processing steps that the system undertakes. It encompasses seat availability checks, the dynamic calculation of pricing based on discounts, and the secure execution of payment transactions. In this orchestration, precision and speed are paramount. The system must execute these operations accurately and expeditiously to deliver a seamless booking experience

#### *3.2.1.4 Outputs*

- In the context of the Ticket Reservation and Booking System, outputs represent the culmination of the user journey. These outputs encompass booking confirmations, reservation particulars, and the issuance of electronic tickets. It falls upon the system to ensure the timely and accurate generation and delivery of these outputs to customers, thereby furnishing them with the requisite information for their theater experience.

#### *3.2.1.5 Error Handling*

- Even in the most finely tuned systems, anomalies can arise. Error handling and resolution constitute the system's ability to gracefully manage issues that may surface during booking transactions. Be it payment discrepancies, seat unavailability, or technical glitches, the system should respond with articulate error messages and offer guidance to customers for issue resolution, ensuring a positive and frictionless customer experience

### **3.2.4 Customer Loyalty Program**

#### *3.2.1.1 Introduction*

- The "Customer Loyalty Program" functional requirement introduces a pivotal component within the Theater Ticketing System. This loyalty program is crafted to elevate the customer experience by acknowledging and retaining devoted patrons. In this section, we outline the precise prerequisites for the efficient implementation and management of the loyalty program.

#### *3.2.1.2 Inputs*

- Input parameters for the loyalty program encompass customer data, comprising personal details and purchase history. It also incorporates user interactions within the system. These inputs play a critical role in ascertaining eligibility for the loyalty program, monitoring user behavior, and furnishing tailored benefits and incentives.

#### *3.2.1.3 Processing*



- The aspect of program logic pertains to the system's algorithms for computing and granting loyalty points. These points are awarded based on various customer interactions, such as ticket acquisitions, referrals, or participation in promotional campaigns. Furthermore, the system should proficiently process requests for redeeming accrued loyalty points, enabling customers to access rewards like discounts or complimentary tickets.

#### *3.2.1.4 Outputs*

- Outputs stemming from the loyalty program encompass notifications sent to customers regarding accumulated points, available rewards, and redemption choices. The system must be adept at producing and conveying these outputs promptly and informatively. This fosters customer engagement and encourages active participation in the loyalty program.

#### *3.2.1.5 Error Handling*

- In the context of the loyalty program, issue resolution entails addressing complications linked to point accrual, redemption, or program eligibility. For instance, if a customer encounters difficulties while redeeming loyalty points, the system should provide unambiguous instructions for resolution. Proficient error handling ensures that customers maintain a positive and gratifying experience during their involvement in the loyalty program

### **3.2.5 Communication and Notification System:**

#### *3.2.1.1 Introduction*

- The functional requirement concerning the "Communication and Notification System" brings forth a pivotal element of the Theater Ticketing System. This system shoulders the responsibility of enabling efficient communication among the system, customers, and other stakeholders. It encompasses a spectrum of communication modes, spanning emails, in-app notifications, and customer support interactions. This section delineates the precise criteria governing the design and functionality of this system.

#### *3.2.1.2 Inputs*

- Inputs to the Communication and Notification System comprise a tapestry of customer data, system events, customer inquiries, and user interactions. These inputs serve as catalysts for triggering and tailoring diverse forms of communication, guaranteeing the delivery of pertinent and well-timed information to customers.

#### *3.2.1.3 Processing*

- The operational facet encapsulates the system's intelligence in determining the nature, timing, and content of communications. It encompasses the establishment of rules and algorithms governing the creation and dispatch of emails, in-app notifications, and customer support responses. Furthermore, the system must possess the capacity to prioritize communications based on factors like urgency and relevance.

#### *3.2.1.4 Outputs*

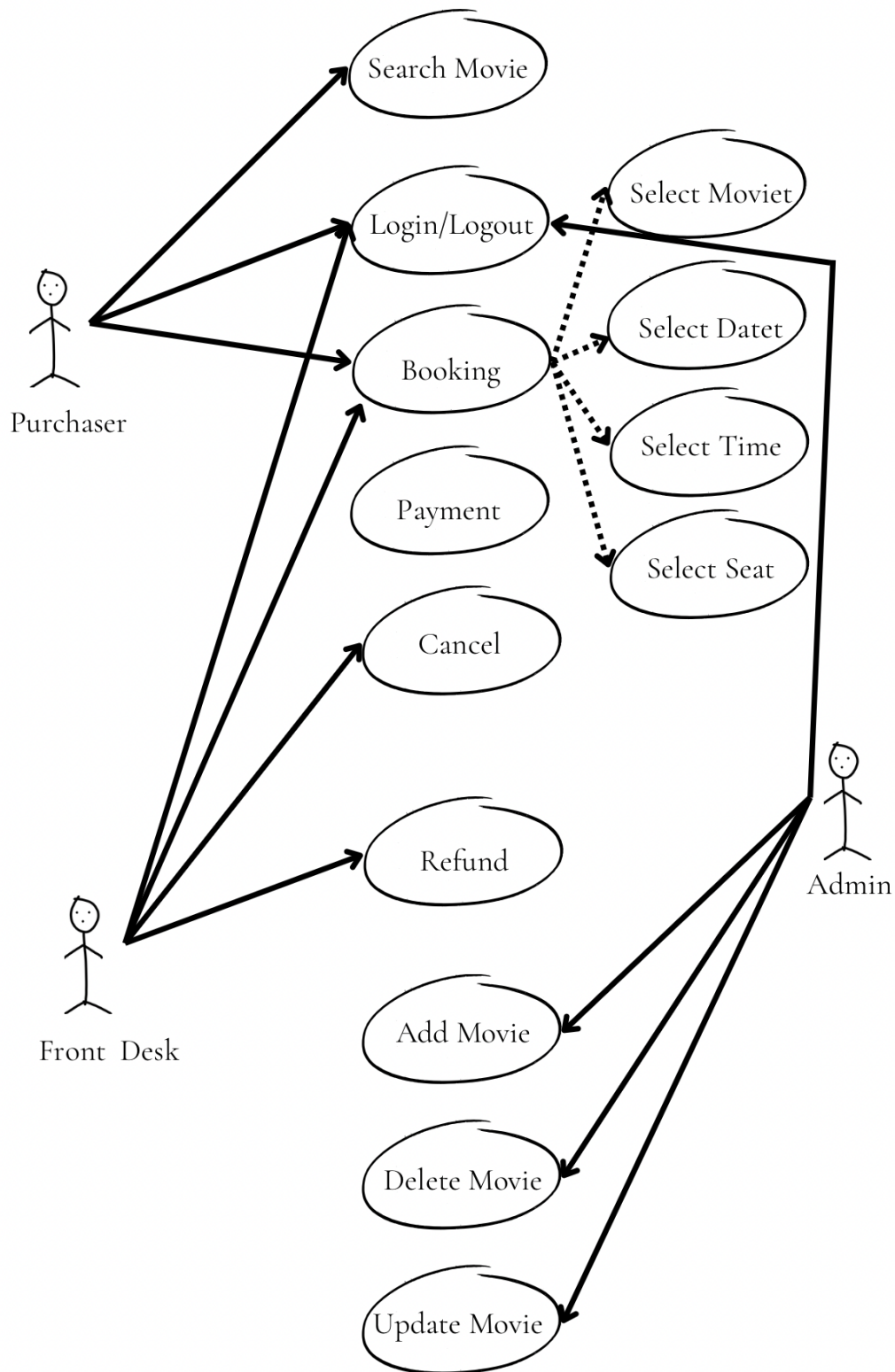
- Outputs emerging from the Communication and Notification System encompass a repertoire of emails, in-app notifications, and customer support interactions. These outputs are forged and disseminated to customers and stakeholders, acting as conduits for the transmission of information, updates, promotions, and support resolutions. The system bears the responsibility of ensuring that these outputs are lucid, pertinent, and reach their intended recipients effectively

#### *3.2.1.5 Error Handling*

- Within the precincts of the Communication and Notification System, issue resolution entails the handling of challenges linked to unsuccessful communication attempts, undelivered messages, or customer support queries. The system should incorporate mechanisms for error detection, notification, and remediation, thereby upholding the ethos of efficient communication and customer contentment

### **3.3 Use Cases**

*Streamline the process of managing the quantity of tickets being sold at a movie theater chain. Should take into consideration capacity limits , sold out showings, as well as returns or refunds.*



### **3.3.1 User Engagement with the Ticketing Management System**

*This use case covers all the main interactions a user might experience with the ticketing system*

#### **3.3.1.1 Primary actor**

- Purchaser

#### **3.3.1.2 Secondary actor**

- System admin, Front Desk team

#### **3.3.1.3 Interfaces**

- In-person Theater kiosk and online platform

#### **3.3.1.4 Preconditions**

- User has access to the online platform or the digital kiosk
- User has an account registered or they have selected a movie and showtime

#### **3.3.1.5 Postconditions**

- User has either a digital or printed ticket
- Proof of payment has been confirmed

#### **3.3.1.6 Normal Course**

1. User browses available movies and showtimes
2. User selects their desired showtime and seat
3. User continues to payment options
4. User selects a method of payment
5. User receives a digital or physical ticket

#### **3.3.1.7 Alternative Courses**

- User decides to cancel their transaction and exits the program
- User requests refund or exchange

### **3.3.2 Front Desk Management System**

*This use case outlines all the fundamental actions the Front Desk can execute with the ticketing system*

#### **3.3.2.1 Primary actor**

- Front desk

#### **3.3.2.2 Secondary actor**

- User, System Admin

#### **3.3.2.3 Interfaces**

- Ticket booth system

#### **3.3.2.4 Preconditions**

- Front Desk staff are logged into the ticket booth system
- Purchaser approaches the front desk

#### **3.3.2.5 Postconditions**

- Customers no longer need assistance with booking, refunds, etc.

#### **3.3.2.6 Normal Course**

1. Staff assist customers walking in to book tickets
2. Aids to in-person questions about showtimes and availability
3. Handles refunds and exchanges
4. Provide physical tickets to customers

#### **3.3.2.7 Alternative Courses**

- The Front Desk directs customers to the online platform for exclusive deals or reservations.
- The Front Desk reaches out to the System Admin regarding technical issues

### **3.3.3 System Administrator Management System**

*This use case centers on the backend activities and system administration functions carried out by the System Admin*

#### **3.3.3.1 Actors**

- System Admin

#### **3.3.3.2 Interfaces**

- Admin Graphical User Interface

#### **3.3.3.3 Preconditions**

- System Administrators are logged into the admin portal

#### **3.3.3.4 Postconditions**

- System configurations are modified, user disagreements are settled, technical problems are rectified, and essential data is either updated or backed up.

#### **3.3.3.5 Normal Course**

1. Modify system configurations as required.
2. Manage and settle user disagreements or ticketing concerns
3. Tackle any system-related technical glitches
4. Oversee and maintain security protocols
5. Refresh show timings or oversee show schedules

#### **3.3.3.6 Alternative Courses**

- System Admin reverts changes because of unforeseen mistakes
- System Admin liaises with external vendors regarding API or payment gateway concerns.

## **3.4 Classes / Objects**

### **3.4.1 Customer Class**

#### **3.4.1.1 Attributes**

Name

- Customer's full name

UserID

- User identification that is unique to the customer

Email

- E-Mail address of the customer

Password

- A unique password that adheres to requirements set by System Admin

#### **3.4.1.2 Functions**

RegisterAccount()

- Allows user to create an account

Login()

- Validates correct User Identification and password and logs the user in

Logout()

- Allows a logged in customer to safely end their session with the system

BookTicket()

- This function allows the customer to make a reservation for a specific showtime and obtain a ticket

CancelTicket()

- Allows the customer to cancel a ticket and request a refund or exchange

### **3.4.2 Ticket Class**

#### *3.4.2.1 Attributes*

TicketID

- A unique identification number for each ticket.

UserID

- The identification number of the user the ticket belongs to

SeatNumber

- The reserved seat number the customer purchased

BookingDate

- The date and time that the reservation was made

#### *3.4.2.2 Functions*

ProduceTicket()

- Upon confirmation of payment, it produces a new ticket

ChecksTicket()

- Validates that the ticket barcode is valid

CancelTicket()

- This function cancels the ticket through user initiation

RefundTicket()

- This function processes the refund to the customer

PrintTicket()

- This function uses a uniform layout to print the ticket

### **3.4.3 Payment Class**

#### *3.4.3.1 Attributes*

PaymentID

- A unique identification number for each payment transaction

UserID

- The identification number of the customer who made the payment

TicketID

- Unique identifier generated

Total

- The total amount of the purchase

PaymentMethod

- States which method of payment was used

TransactionDate

- The date and time that the transaction was made

Status

- States whether the method of payment is successful, declined, pending, or failed

PaymentSummary

- Summarizes the amount, method of payment, etc.

#### 3.4.3.2 Functions

ProcessPayment()

- This function initiates the payment process

RefundPayment()

- This function handles refunds when initiated

GetPaymentStatus()

- This function gives the status of the payment used

UpdatePaymentMethod()

- Allows users to choose an alternative payment method (i.e. first payment was declined)

GetPaymentHistory()

- Shows the history of all past payments and purchases made by the user

CancelPendingPayment()

- Cancels payments and only payments that are still pending

### 3.5 Non-Functional Requirements

*Non-functional requirements play a vital role in assessing the overall quality and performance of the Theater Ticketing System. They concentrate on characteristics that affect the system at a broader level, rather than delving into individual components or functions. These requirements are articulated using measurable criteria to guarantee a clear assessment and compliance with system-wide benchmarks.*

#### 3.5.1 Performance

- Clearly define specific response time objectives for activities like website loading or payment processing.
- Specify the number of transactions or operations that the system should handle within a given time frame.
- Detail how the system should adapt to accommodate increased user activity during peak periods while maintaining responsiveness
- Establish thresholds for the utilization of system resources such as CPU, memory, and bandwidth

#### 3.5.2 Reliability

- Define the expected duration of uninterrupted operation before a failure is anticipated.
- Explain how the system should manage errors and continue functioning in the presence of faults.
- Specify the percentage of time the system must be available for use

#### 3.5.3 Availability

- Establish the minimum acceptable uptime percentage, such as 99.9%
- Outline the maximum permissible downtime within a specified time frame, e.g., no more than one minute per day.

#### **3.5.4 Security**

- Specify the robustness of user authentication methods, such as password complexity or multi-factor authentication.
- Define the standards for encrypting data during transmission and storage
- Detail who can access specific system features and data, along with the associated conditions
- Ensure that the system adheres to pertinent data protection and privacy regulations

#### **3.5.5 Maintainability**

- Specify how easily the system can be altered to accommodate changes or incorporate new features.
- Define criteria for evaluating the system's components and functions during testing
- Describe the depth and comprehensiveness of system documentation designed to assist with maintenance

#### **3.5.6 Portability**

- The web-based interfaces of the system should seamlessly integrate with standard web browsers, such as Google Chrome, Mozilla Firefox, Microsoft Edge, and Safari. The system must remain agile in accommodating shifts in browser technologies and versions to sustain its portability.
- The mobile applications associated with the system should demonstrate compatibility across a spectrum of mobile devices, encompassing varying screen sizes and resolutions. The system's ability to acclimatize to alterations and advancements in mobile device technologies is pivotal
- The system should facilitate the integration of third-party services, APIs, and components that are conventionally utilized within the industry. It should possess the flexibility to adjust to shifts in third-party interfaces and technologies.
- The system should be equipped with robust localization support, enabling its utilization across diverse regions and languages. It should possess the versatility to incorporate new languages and account for cultural nuances.
- Where applicable, the system must offer cross-platform functionality, affording users seamless access across a myriad of devices and platforms. Future-proofing considerations should encompass compatibility with emerging platforms and technologies.

### **3.6 Inverse Requirements**

- In cases where system updates or maintenance are necessary, the system should strive to minimize downtime to prevent disruptions to user services. Whenever feasible, downtime should be scheduled during off-peak hours.
- The system should be designed to avert the presentation of incorrect ticket prices to customers, assuring that they are accurately charged based on their selections.



- The system should implement safeguards to forestall data corruption, ensuring the accuracy and dependability of customer information, bookings, and transactions.
- The system should refrain from processing identical payment transactions more than once to avert potential overcharging of customers or financial discrepancies.
- The system should incorporate safeguards to avert overbooking of movie screenings, thereby ensuring that customers do not purchase more tickets than the available seating capacity permits.
- The system must establish robust measures to thwart unauthorized access to customer accounts and sensitive data, guaranteeing that only authenticated users can engage in actions like ticket booking and payment processing
- The system should take proactive measures to alleviate performance bottlenecks during peak hours or periods of high user traffic, ensuring that user interactions remain responsive.

### **3.7 Design Constraints**

- Ensuring strict compliance with data privacy regulations, such as GDPR or CCPA, stands as a paramount concern. This constraint significantly influences the handling, storage, and protection of customer data within the system. Non-compliance may result in legal repercussions and harm to the system's reputation
- Conforming to established industry standards governing ticketing and payment processing holds utmost importance for fostering interoperability and trust. Failure to meet these standards can lead to compatibility issues, which could, in turn, impact the system's ability to collaborate with other systems and services.
- Seamless integration with theater hardware components, including digital kiosks and ticket scanners, assumes critical significance in delivering a streamlined user experience. This constraint ensures that the software effectively communicates with theater equipment, enabling on-site ticket purchases and validation.

### **3.8 Logical Database Requirements**

- Prescribe distinct data formats for various categories of information to guarantee uniformity and precision in data storage. This encompasses formats for customer particulars, movie specifics, showtimes, and payment data.
- Institute regulations and restrictions to uphold data integrity within the database. This entails defining validation protocols, unique identifiers, and interrelationships among data tables to preclude erroneous or incomplete data from infiltrating the system.
- Enforce robust access control mechanisms to shield sensitive data. Specify user roles and permissions to manage who possesses the authority to view, modify, or delete data within the database, thus ensuring the security and confidentiality of data

- Lay out protocols for periodic database backups and data retrieval procedures. This is indispensable for shielding data against unforeseen disruptions or data loss, thereby guaranteeing data accessibility and the uninterrupted operation of business processes

### **3.9 Other Requirements**

- Detail the security requisites, encompassing authentication, authorization, encryption, and safeguards against common vulnerabilities like SQL injection and cross-site scripting.
- Precisely stipulate performance benchmarks, response times, and capacity requirements to assure the system's optimal performance under diverse circumstances
- Define the duration for which data will be retained, delineate archival or purging timelines, and take into account legal or compliance mandates concerning data retention.

## **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**