Introduction to Software Engineering ECCE 336

Online Software System for Movies

Software Requirements Specification

Version 1.0

Prepared by: **Alanood Alqaydi 100060365**

Sultan Alshehhi 100060746

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Introduction

Purpose

The purpose of this document is to outline the software requirements for an online movie information system. This document contains the scope of the product, all necessary features, functionalities, and interfaces. Its goal is to fulfill the client's objectives of creating a comprehensive online system for movie information and sales.

Document Conventions

- ***Font Styles:*** Standard font styles, such as Times New Roman, Calibri or Arial, have been used throughout the document for readability.
- ***Section Headings:*** Section headings are formatted in bold or underlined to distinguish them from the rest of the content.
- ***Priority:*** Each requirement statement is assigned its own priority to indicate its level of importance. Priorities can be indicated using a numeric scale (e.g., 1, 2, 3) or descriptive terms (e.g., High, Medium, Low).

Intended Audience and Reading Suggestions

This SRS is for developers, project managers, testers, documentation writers, and stakeholders involved in software development. It provides functional and non-functional requirements for developers and helps project managers plan resources and track progress. Testers can derive test cases from this document.

The document is organized into various sections, including an overview, functional requirements, non-functional requirements, system interfaces, and constraints. It is recommended to begin reading the overview sections to gain a high-level understanding of the software system and its purpose. Afterward, readers can focus on sections that are most pertinent to their roles or areas of interest.

Product Scope

The software being specified is an online movie information system that provides details about movies, actors, actresses, and movie studios. The primary purpose of this system is to offer customers access to information on movies available for sale. The system will allow users to search for movies based on various criteria such as title, genre, and year of release. It will provide comprehensive details about each movie, including its title, year of release, genre, running time, director, and actors/actresses involved. The system will also support the association of actors/actresses with specific roles in movies, designating lead actors, and providing information about the movie studios and producers associated with each movie.

The software system aims to streamline the process of accessing movie information, enabling customers to make informed decisions when browsing movies. It provides a user-friendly interface, efficient search functionality, and comprehensive data to enhance the movie browsing and selection experience. The software aligns with the client's goal of offering an online platform that serves as a reliable source of information for customers interested in purchasing movies.

Overall Description

Product Perspective

The software system being developed in this project is an online platform that provides information on movies available for sale to customers. It is a new, self-contained product designed to meet the client's primary goal of creating a user-friendly and accessible online system for movie enthusiasts.

This software system will serve as a centralized hub for movie-related information, including details about movies, actors, and actresses. Users will be able to browse through a collection of movies and obtain information such as the title, year of release, genre, running time, and the name of the movie's director. The system will also feature information about the movie studios involved in the production process.

The software system will be independent and not a replacement for any existing systems. It will provide a unique and comprehensive platform for customers to explore and discover movies they are interested in purchasing. It will facilitate the process of finding relevant information about movies, such as their cast, crew, and production details, all in one place.

From a larger system perspective, this software system can be considered a component within the broader entertainment industry. It may interact with external systems or services, such as online movie marketplaces or streaming platforms, to provide additional functionality or enable seamless integration. Overall, the product perspective of this software system revolves around creating a dedicated online platform that consolidates movie information and serves as a valuable resource for customers interested in exploring and purchasing movies.

Product Functions

major functions that the product must perform:

1. **Movie Information:**
   - Provide details about movies, including titles, release years, genres, running times, and directors.
   - Allow users to search for movies based on various criteria, such as title, genre, or director.
2. **Actor and Actress Information:**
   - Store information about actors and actresses, including names, dates of birth, and filmography.
3. **Movie Studio Information:**
   - Maintain a database of movie studio details, including names and addresses.
4. **Producer Information:**
   - Store information about movie producers.
5. **Director Information:**
   - Maintain records of movie directors.
6. **User Interactions:**
   - Provide a user-friendly interface for seamless navigation and interaction with the software system.
   - Allow users to personalize their experience, such as saving favorite movies.
7. **Search and Filtering:**
   - Enable advanced search and filtering options for users to find specific movies based on various criteria.

User Classes and Characteristics

The following user classes are anticipated to use this product:

1. Regular Users:
- Frequency of Use: Frequent users access the web frequently for movie information, searches, and interaction.
- Technical Expertise: They have varying levels of technical proficiency.
- Educational Level: No specific educational requirements.
- Experience: Different levels of experience with movie-related platforms.

2. Administrators:
- Frequency of Use: Administrators regularly use the product for system management.
- Functions Used: They have additional functions for administration and content management.
- Technical Expertise: They possess higher technical expertise in system administration.
- Security/Privilege Levels: Administrators have advanced privileges.
- Experience: Experience in managing similar systems.

3. Developers:
- Frequency of Use: Developers use the product during development and maintenance.
- Functions Used: They require access to codebase, tools, and documentation.
- Technical Expertise: Advanced technical skills in development, programming, and databases.
- Security/Privilege Levels: Developers may have advanced access for code modification.
- Experience: Experience in software development and similar systems.

Regular users are essential to the product's success, while administrators and developers play important roles in managing and maintaining the system.

Operating Environment

The software system will operate within a web-based environment. It will be accessible online through a web browser, and users will interact with the system through a graphical user interface (GUI). The software will be designed to run on various hardware platforms, including desktop computers, laptops, tablets, and smartphones. It should be compatible with popular operating systems such as Windows, macOS, and Linux, as well as mobile platforms like iOS and Android.

To ensure compatibility and performance, the software system will require a modern web browser that supports HTML5, CSS3, and JavaScript. It should also be designed to coexist peacefully with other software components or applications that users may have installed on their devices, such as antivirus software, firewalls, and ad-blockers.

Design and Implementation Constraints

The development of the software system must adhere to certain constraints and considerations. These include:

Technology Stack: The software system should be developed using appropriate technologies, tools, and frameworks that support web development, such as HTML, CSS, JavaScript, and a backend programming language like Python, Java, or Ruby.

Database: A database management system (DBMS) will be required to store and retrieve movie, actor, and studio information. The specific DBMS to be used should be determined based on the project requirements and compatibility with the chosen programming language and frameworks.

Security Considerations: The software system should incorporate appropriate security measures to protect user data and prevent unauthorized access. This may include encryption of sensitive information, secure communication protocols (such as HTTPS), and implementing user authentication and authorization mechanisms.

User Interface Guidelines: The software system should follow user interface design conventions and standards to ensure a consistent and intuitive user experience. The client's organization may have specific design guidelines that need to be followed.

User Documentation

The following user documentation components will be delivered along with the software system:

User Manuals: Comprehensive manuals will be provided to guide users on how to navigate and use the various features and functionalities of the software system. The manuals will include step-by-step instructions, screenshots, and explanations.

Online Help: An online help system will be included, accessible from within the software, providing context-sensitive assistance and guidance to users.

Tutorials: Interactive tutorials or video guides may be provided to assist users in getting started with the software system and to demonstrate key features and workflows.

The user documentation will be delivered in digital formats, such as PDF files or online documentation accessible through the software system's interface. It will conform to standard documentation practices and may follow specific industry or organizational standards, if applicable.

Assumptions and Dependencies

The following assumptions and dependencies are identified for the software system:

- **Third-party APIs:** The software system may rely on third-party APIs or services to retrieve additional movie-related information, such as movie ratings, reviews, or movie trailers. The availability and compatibility of these APIs need to be confirmed.

- **Internet Connectivity:** The software system assumes that users will have a stable internet connection to access and use the online features and data. Offline functionality may be limited or not available.

- **Movie Data Accuracy:** The software system assumes that the movie data, including details about actors, actresses, directors, and movie studios, will be provided accurately and reliably. The system's functionality and correctness depend on the accuracy of this data.

- **Scalability and Performance**: The software system assumes a moderate number of concurrent users and a reasonable amount of movie data. If the number of users or the volume of data increases significantly, the system's performance and scalability may need to be reassessed.

- **No Existing Legacy Systems:** The project assumes that there are no existing legacy systems or software components that need to be integrated or migrated with the new software system.

External Interface Requirements

User Interfaces

1. User Interface Design: The user interface is designed with modern design principles, emphasizing simplicity, ease of use, and visually appealing layouts.

2. Standard Buttons and Functions: The user interface includes standard buttons and functions that ensure consistent navigation and user experience across different screens.

3. Error Message Display: Error messages are displayed in a clear and concise manner, offering helpful information to users in case of input validation errors, system failures, or other issues.

4. Keyboard Shortcuts: The user interface may support keyboard shortcuts to enhance navigation and interaction speed for users who prefer or rely on keyboard-based input methods.

Hardware Interfaces

Logical characteristics:

- The software system will interact with the hardware through a web browser.
- The web browser will send requests to the software system, and the software system will send responses back to the web browser.
- The data and control interactions between the software and the hardware will be in the form of HTTP requests and responses.

Physical characteristics:

- The software system will be hosted on a web server.
- The web server will be connected to the internet.
- The web browser will be used to access the software system from a client computer.

Supported device types: The hardware interfaces for the movie software system will support the following device types:

- Personal computers
- Laptop computers
- Mobile devices
- Any smart device that has internet connection

The following communication protocols will be used by the hardware interfaces:

- **HTTP:** The software system will use the HTTP protocol to communicate with web browsers.
- **TCP/IP:** The software system will use the TCP/IP protocol to communicate with the internet.

In addition to the above, the hardware interfaces for the movie software system will also need to support the following:

- **Security:** The hardware interfaces will need to be implemented in a secure manner to protect the confidentiality, integrity, and availability of the data.
- **Scalability:** The hardware interfaces will need to be scalable to support a large number of users.
- **Reliability:** The hardware interfaces will need to be reliable to ensure that the software system is available 24/7.

The hardware interfaces for the movie software system are designed to be as flexible and scalable as possible. The software system can be hosted on any web server that is connected to the internet. The web browser can be any major web browser. The hardware interfaces are also designed to be secure. The data that is transmitted between the software system and the web browser is encrypted using SSL.

Software Interfaces

Database Interface:

The software system will require a connection to a database management system (DBMS) to store and retrieve movie information, including details about movies, actors, actresses, directors, producers, and movie studios. The specific DBMS and version will depend on the client's requirements, but common examples include MySQL, PostgreSQL, or Oracle Database. The software will utilize structured query language (SQL) to interact with the database, executing queries to retrieve and update data as necessary.

Operating System Interface:

The software system will be developed to run on a specific operating system, such as Windows, macOS, or Linux. The choice of the operating system will depend on the client's preferences and requirements. The software will utilize the operating system's APIs (Application Programming Interfaces) to perform various operations, such as file handling, network communication, and process management.

Web Interface:

As the software system is intended to be accessible online, it will require a web interface to provide users with access to movie information. The web interface will be developed using web technologies such as HTML, CSS, and JavaScript. It will support standard web browsers, including Chrome, Firefox, Safari, and Edge, ensuring compatibility across different platforms. The web interface will facilitate user interactions, such as searching for movies, viewing movie details, and managing user accounts.

API Interfaces:

To facilitate integration with other software components or external services, the software system may provide application programming interfaces (APIs). These APIs will define protocols and methods for exchanging data and functionality with other systems. For example, an API could be created to allow third-party applications to retrieve movie information or perform specific actions within the system. The API interfaces will be documented in detail, including specifications for data formats, authentication mechanisms, and supported operations.

Data Sharing:

The software components within the system will share data through the database interface. Information about movies, actors, actresses, directors, producers, and movie studios will be stored and retrieved from the database. The data will be structured in a way that allows efficient querying and retrieval based on various criteria, such as movie titles, genres, or actor names. The sharing mechanism will rely on the consistency and integrity of the database, ensuring that all components access and update the shared data accurately.

Communications Interfaces

HTTP(S) Protocol:

The web interface of the software system will utilize the Hypertext Transfer Protocol (HTTP) or its secure variant, HTTPS, for communication between the web server and clients (web browsers). HTTP/HTTPS will handle requests for movie information, search queries, and user interactions. The software system will comply with the HTTP standards, ensuring proper message formatting, status codes, and request/response handling.

Network Protocols:

The software system may require communication with external services or systems through network protocols such as File Transfer Protocol (FTP) or other custom protocols. These protocols will enable the transfer of data files or integration with external systems, as needed. The specific protocols and their implementation details will depend on the client's requirements.

Data Security:

To ensure secure communication, the software system may implement encryption mechanisms, such as Secure Sockets Layer (SSL) or Transport Layer Security (TLS), when transmitting sensitive data over the network. The system will follow industry best practices for data encryption and take appropriate measures to protect user information and maintain confidentiality.

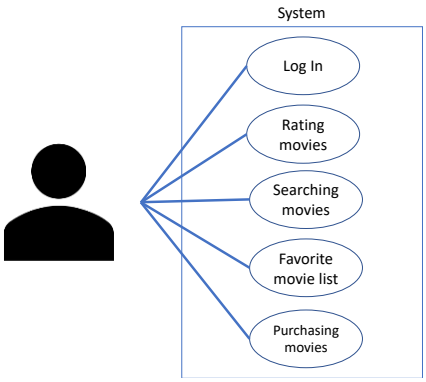
Synchronization Mechanisms:

If the software system involves distributed components or multiple instances running concurrently, synchronization mechanisms may be required. These mechanisms will ensure that data remains consistent across different components or instances. Techniques like locks, semaphores, or distributed consensus algorithms may be used to coordinate data access and updates, depending on the specific implementation requirements.

System Features

User Requirements

User case Diagram



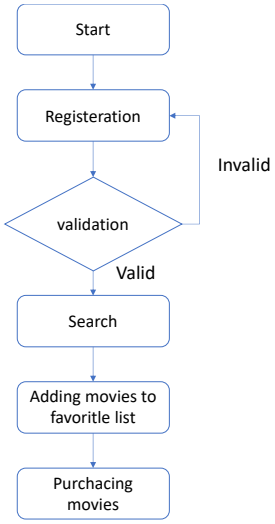
REQ-1: User Registration and login (H): there will be a login page where they can enter their login information, which includes their email address and password. Additionally, users will have the option to log in using their Google account.

REQ-2: Searching functionality (H): users can search for a movie using a variety of parameters, such as movie title, genre, actor and actress name.

REQ-3: Adding the movie to the favorite list (M): users can add the movies they like to a favorite list so they can find them easily.

REQ-4: Adding the movie to the cart and purchase it (M): users can add the movies to the cart and purchase them.

Activity Diagram for the user:



User Interface Specifications:

Main Dashboard:

The main dashboard serves as the primary interface for users after logging into the system.

It displays relevant information and options for navigation to different sections.

The dashboard may include a search bar to quickly find movies or actors.

Movie Details:

This interface component shows comprehensive information about a selected movie.

It includes details like title, year of release, genre, running time, director, and the list of actors.

Users can also see the role assigned to each actor in the movie.

Actor Details:

This interface component provides extensive information about a selected actor.

It includes details such as the actor's name, date of birth, and a list of movies they have acted in.

Users can also see the role assigned to the actor in each movie.

Studio Details:

This interface component provides comprehensive information about a selected movie studio.

It includes details like the studio's name, address, and a list of movies they have produced.

Search Interface:

The search interface allows users to search for movies or actors based on specific criteria.

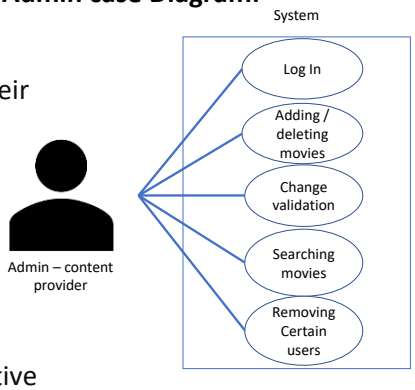
Users can input search keywords, such as movie titles or actor names, to find relevant results.

Admin (Content Provider) Requirements:

BRIEF-DESCRIPTION:

Content providers can add movies to the platform, along with their related information

Admin case Diagram:



REQ-1: Admin login (H):

there will be a login page where the admin can log in.

REQ-2: Adding/ removing & managing movies (H):

After a successful log in, the admin can add a movie with its relative information and remove movies as well.

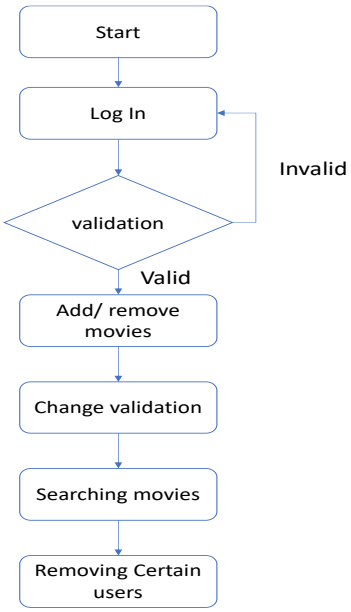
REQ-3 Changes Validation(H):

The system shall validate the changes made by administrators to movie details or actor information to ensure data integrity and consistency.

REQ-4 Searching functionality (H): The system shall provide a search functionality to allow administrators to find specific movies or actors based on their attributes (e.g., title, year, actor's name).

REQ-5 Removing Certain users (M): The system shall provide the ability to remove a user as an option in cases where the user violates the Terms of Service, exhibits account inactivity, maintains multiple accounts under a single customer, or upon customer request.

Activity Diagram for the Admin:



Other Nonfunctional Requirements

Performance Requirements

Software performance requirements focus on delivering an efficient and seamless user experience. Performance requirements are as follows:

1. **Response Time:** Web pages and search results should load quickly, minimizing delays.

2. **Scalability:** A database should be scalable to accommodate growing traffic, allowing multiple users to access it without affecting performance.

3. **Database Optimization:** Movie-related data should be retrieved and stored efficiently using database queries and operations.

4. **Concurrent User Support:** Multiple users should be able to access the system at the same time without noticeable performance issues.

5. **Search Efficiency:** Users should be able to find movies using the search functionality, even with a large dataset.

6. **System Availability:** Maintenance and upgrades should be performed with minimal user downtime, ensuring uninterrupted access.

7. **Performance Monitoring:** It is important to monitor performance metrics, including response times, server load, and database performance.

Safety and Security Requirements

- The software must not allow users to enter invalid data, such as negative movie running times or dates before the movie was released.
- The software must not allow users to delete or modify important data, such as the title or year of release of a movie.
- The software must be designed to prevent unauthorized access to sensitive data, such as the personal information of actors or actresses.
- The software must be backed up regularly to prevent data loss in the event of a system crash.
- The software must use strong passwords and encryption to protect sensitive data.
- The software must require users to authenticate themselves before they can access sensitive data.
- The software must log all user activity to track any unauthorized access attempts.
- The software must be compliant with all applicable privacy regulations.

External Policies and Regulations

- The software must comply with the General Data Protection Regulation (GDPR).
- The software must comply with the California Consumer Privacy Act (CCPA).

Safety Certifications

- The software must be certified by a reputable security organization, such as the International Organization for Standardization (ISO).

Software Quality Attributes

Availability: The system aims to include a wide range of movies. While it may not have every movie, efforts will be made to provide as many movies as possible. When a user searches for a specific movie, it should be available for them to access.

Correctness: When users search for movies using keywords such as genres or movie names, the system should recommend accurate and relevant movies.

Maintainability: Continuous integration will be employed in the application to enable seamless deployment of features and bug fixes without causing downtime.

Usability: The user interface should be intuitively designed, allowing users to navigate and accomplish their goals without the need for a tutorial. The system should facilitate a user-friendly experience, minimizing errors and ensuring ease of learning and usage.

Business Rules

Users:

- Users must create an account before they can access the system.
- Users must provide their name, email address, and password when creating an account.
- Users can reset their password if they forget it.

Roles:

- There are three roles in the system: user, administrator, and moderator.
- Users can view movie information, search for movies, and add movies to their favorites.
- Administrators can create and delete movies, actors, and directors. They can also add and remove users from the system.
- Moderators can approve or reject new movies that are submitted by users.

Permissions:

- Each role has a set of permissions that determine what they can do in the system.
- For example, users can view movie information, but they cannot create or delete movies.
- Administrators can do everything that users can do, plus they can create and delete movies, actors, and directors.
- Moderators can do everything that users can do, plus they can approve or reject new movies that are submitted by users.

Concurrency:

- The system must be able to handle multiple users accessing the system at the same time.
- The system must ensure that data remains consistent even when multiple users are editing the same data.

Security:

- The system must be secure to protect user data.
- The system must use encryption to protect sensitive data, such as passwords.
- The system must have a login mechanism to prevent unauthorized users from accessing the system.