**StudyTube Android Application**

Software Requirements Specification

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**1. Introduction**

The introduction section of the Software Requirements Specification (SRS) provides an overview of the complete document. The SRS outlines the requirements that will guide the design, development, and implementation of the StudyTube Android application. This section aims to provide a clear understanding of the purpose, scope, and organization of the SRS document.

**1.1 Purpose**

The purpose of this SRS is to define the requirements and specifications for the StudyTube Android application. This document serves as a comprehensive guide for software engineers and developers involved in the creation of the application. It outlines the features, functionalities, and constraints of the StudyTube app, ensuring a common understanding among all stakeholders, including developers, project leaders, and users.

**1.2 Scope**

The scope of the StudyTube Android application encompasses the development of a dedicated learning platform focused on Android development. The application will provide users with access to a curated collection of instructional videos, tutorials, study materials, quizzes, and interactive exercises related to Android development. The app's primary audience includes college students and individuals seeking to learn Android app development.

**1.2.1 Included Features and Functionalities**

The StudyTube app will include the following features and functionalities:

Video Content: The app will offer a wide range of instructional videos covering various aspects of Android development.

Tutorials: Users can access tutorials that provide step-by-step guidance on Android app development concepts.

Study Materials: Study materials such as lecture notes, code examples, and reference documents will be available for users.

Quizzes and Exercises: Interactive quizzes and exercises will help users assess their understanding of learned concepts.

User Profiles: Users can create personalized profiles to track their progress, save favorite content, and customize their learning experience.

Search Functionality: An efficient search feature will enable users to find specific topics, videos, or materials.

User Interaction: Users can engage with each other through comments, discussions, and collaborative learning.

Responsive Design: The app will be designed to ensure a seamless user experience across various Android devices.

**1.2.2 Excluded Features and Functionalities**

The StudyTube app will not include the following features:

- Social media integration for sharing content on external platforms.

- In-app purchases or premium content.

- Real-time video streaming (offline access to videos will be provided).

- User-generated content uploads.

**1.3 Definitions, Acronyms, and Abbreviations**

SRS: Software Requirements Specification

Android: An operating system developed by Google for mobile devices.

UI: User Interface

UX: User Experience

**1.4 References**

- [List any references or external documents that are relevant to this SRS]

**1.5 Overview**

The rest of the SRS is organized as follows:

- Section 2: General Description

- Section 3: Specific Requirements

- Section 4: Analysis Models

- Section 5: Change Management Process

- Appendix A: Appendices

The subsequent sections will provide detailed information about the general factors affecting the application, specific functional and non-functional requirements, analysis models, change management process, and any additional information provided in the appendices.

**2. General Description**

The general description section of the Software Requirements Specification (SRS) provides an overall understanding of the StudyTube Android application, its purpose, and the factors that influence its requirements.

**2.1 Product Perspective**

The StudyTube Android application is a standalone learning platform that operates independently on Android devices. It is not directly integrated with other software systems or applications. However, the StudyTube app may offer integration options for future versions, allowing users to link their accounts with external platforms for enhanced learning experiences.

**2.1.1 System Interfaces**

The StudyTube app interacts with the Android operating system, utilizing its interface elements and capabilities to deliver a seamless user experience. It will also interface with online servers to retrieve and update content, user data, and progress tracking information.

**2.1.2 User Interfaces**

The app will provide an intuitive and user-friendly interface that allows users to navigate through various sections, access content, and interact with learning materials. The user interface will adhere to Android's Material Design guidelines, ensuring consistency and familiarity for users.

**2.2 Product Functions**

The StudyTube Android application is designed to perform the following functions:

Access Learning Materials: Users can access a wide range of learning materials, including videos, tutorials, study guides, and quizzes, tailored specifically for Android development.

Interactive Quizzes:The app provides quizzes that allow users to test their knowledge of Android concepts and receive immediate feedback on their performance.

Personalized Learning Paths: Users can create customized learning paths by selecting topics, subjects, and modules of interest. The app will recommend relevant materials based on

**user preferences**

Progress Tracking:Users can track their learning progress, view completed modules, and monitor quiz scores.Community Interaction: The app fosters a sense of community by enabling users to engage in discussions, share insights, and collaborate on learning projects.Search and Navigation: An efficient search feature and intuitive navigation menus help users find specific content quickly.Offline Access:Users can download selected videos and materials for offline viewing, allowing learning even without an active internet connection.

**2.3 User Characteristics**

The StudyTube app is designed for the following categories of users:

College Students: The primary target audience, college students, are looking to enhance their understanding of Android development concepts for academic and personal growth.

Self-Learners: Individuals interested in learning Android app development on their own time and pace will benefit from the app's user-friendly resources.

Educators and Instructors: Educators and instructors seeking supplementary materials to support their Android development courses can find relevant content on the app.

**2.4 General Constraints**

The development of the StudyTube Android application is subject to the following constraints:

Platform Limitations: The app will be developed exclusively for Android devices, limiting its compatibility to devices running the Android operating system.

Content Availability: The availability of instructional videos, tutorials, and study materials is contingent on partnerships with content providers and creators.

Offline Access:While offline access to downloaded content is supported, interactive features such as quizzes and community interactions require an active internet connection.

**2.5 Assumptions and Dependencies**

The StudyTube app development assumes the availability of the Android SDK and development tools. It also depends on reliable internet connectivity for content synchronization and updates.

**3. Specific Requirements**

The specific requirements section outlines the detailed functional and non-functional requirements of the StudyTube Android application. These requirements serve as guidelines for the app's design, implementation, and testing phases.

**3.1 External Interface Requirements**

**3.1.1 User Interfaces**

The user interface of the StudyTube app should adhere to Android's Material Design principles for a consistent and visually appealing user experience. Key interface elements include:

Navigation Drawer: A navigation drawer providing access to different sections of the app, including Home, Videos, Quizzes, Community, and Settings.

Course Listings: Clear and organized listings of available courses, modules, and topics for users to choose from.

Video Player:A video player with playback controls, progress tracking, and full-screen viewing mode.

Quiz Interface:A user-friendly quiz interface for interactive quizzes, with multiple-choice questions and immediate feedback.

Search Bar:An integrated search bar enabling users to search for specific topics, courses, or materials within the app.

**3.1.2 Hardware Interfaces**

The StudyTube app requires standard hardware components available on Android devices, including a display for video playback, touch input for navigation, and internet connectivity for content synchronization.

**3.1.3 Software Interfaces**

The app will interact with the Android operating system to utilize system-level features such as notifications, storage access, and sharing options. It may also include integrations with third-party libraries for video streaming, quiz functionalities, and community engagement.

**3.1.4 Communications Interfaces**

The app will communicate with external servers to fetch content, user data, and progress tracking information. APIs and protocols such as HTTP will be used for data exchange between the app and the servers.

**3.2 Functional Requirements**

**3.2.1 Learning Material Access and Navigation**

**3.2.1.1 Introduction**

Users should be able to access learning materials and navigate through various sections of the app.

**3.2.1.2 Inputs**

User interaction with the navigation drawer, buttons, and menus.

Selection of courses, modules, and topics.

**3.2.1.3 Processing**

The app processes user inputs and retrieves relevant content based on their selections.

**3.2.1.4 Outputs**

Display of course listings, module details, and learning materials.

Presentation of video content, study guides, and tutorials.

**3.2.1.5 Error Handling**

The app should display appropriate error messages if the selected content is unavailable or if there are network connectivity issues.

**3.2.2 Interactive Quizzes**

**3.2.2.1 Introduction**

Users should be able to take interactive quizzes to test their understanding of Android development concepts.

**3.2.2.2 Inputs**

User selection of quizzes.

Submission of quiz answers.

**3.2.2.3 Processing**

The app evaluates user responses and calculates quiz scores.

**3.2.2.4 Outputs**

Display of quiz questions, options, and feedback.

Presentation of quiz scores and correct answers.

**3.2.2.5 Error Handling**

The app should handle cases where quiz answers are submitted incompletely or if there are technical issues during quiz submission.

**3.3 Use Cases**

The Use Cases section provides specific scenarios that describe how users interact with the StudyTube app and how the app responds to user actions.

**3.3.1 User Registration and Login**

**3.3.1.1 Description**

This use case outlines the process of user registration and login to the StudyTube app.

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**3.3.2.2 Actors**

User

**3.3.2.3 Preconditions**

The user is registered and logged into the app.

The user has selected a specific course or module.

**3.3.2.4 Flow of Events**

The user navigates to the "Courses" or "Modules" section of the app.

The user selects a specific course or module they want to study.

The app displays a list of available learning materials for the selected course/module.

The user chooses a specific material, such as a video tutorial or study guide.

The app loads and presents the selected learning material for the user to view.

**3.3.2.5 Postconditions**

The user can access and view the selected course material.

The user's progress may be tracked for future reference.

**3.4 Classes / Objects**

**3.4.1 User Account**

**3.4.1.1 Attributes**

Username: Unique identifier for the user's account.

Email: User's email address for communication and login.

Password: Securely stored user password.

Courses Enrolled: List of courses the user has enrolled in.

Progress: Tracking of the user's progress in various courses.

**3.4.1.2 Functions**

Register(): Creates a new user account based on provided details.

Login(): Verifies user credentials and grants access to the app.

EnrollCourse(course): Adds a new course to the user's enrolled courses list.

TrackProgress(course, module, content): Records the user's progress in different courses and materials.

**3.5 Non-Functional Requirements**

Non-functional requirements outline the qualities and characteristics of the StudyTube app that are not directly related to its functionality but contribute to its overall performance, security, and user experience.

**3.5.1 Performance**

The app should load course materials and videos within 3 seconds on a standard 4G network.

Response time for user interactions should be less than 0.5 seconds.

The app should support a minimum of 1000 concurrent users without significant performance degradation.

**3.5.2 Reliability**

The app should have a minimum uptime of 99.9%.

In case of app crashes, the user should be able to resume their session without data loss.

Data loss or corruption due to app failures should be minimized.

**3.5.3 Availability**

The app should be available for use 24/7.

Scheduled maintenance, if required, should be communicated to users in advance.

The app should support offline access to downloaded course materials.

**3.5.4 Security**

User passwords should be stored securely using encryption techniques.

User authentication should be implemented to prevent unauthorized access.

Data transmission between the app and server should be encrypted using HTTPS.

**3.5.5 Maintainability**

Code should be well-documented and organized for ease of maintenance.

Updates and bug fixes should be deployed without significant downtime.

Future enhancements should be easy to integrate without major codebase changes.

**3.5.6 Portability**

The app should be compatible with Android devices running Android 6.0 (Marshmallow) and above.

The user interface should adapt to different screen sizes and orientations.

**3.6 Inverse Requirements**

Inverse requirements state conditions under which the system should not perform certain actions or should behave differently.

The app should not allow unauthorized users to access course materials or quizzes.

User data should not be shared with third parties without user consent.

**3.7 Design Constraints**

The app's design should follow Material Design guidelines for a consistent and intuitive user experience.

The app should be developed using Java and Android Studio.

The app should be designed to minimize data usage, especially for users on limited data plans.

**3.8 Logical Database Requirements**

The app's database should store user account information, course details, module progress, and quiz results.

Data integrity and security should be maintained through appropriate database management techniques.

**3.9 Other Requirements**

The app should provide an option for users to provide feedback and report issues.

The app should support multiple languages, with English as the default language.

The app should be able to handle peak usage during exam seasons without performance degradation.

**4. Analysis Models**

This section presents the analysis models that were used during the development of the StudyTube app. These models help to visualize the behavior, interactions, and flow of the application's processes.

**4.1 Sequence Diagrams**

Sequence diagrams depict the interactions between various components of the system over a specific scenario or use case. They illustrate the order in which messages are exchanged between objects.

Sequence diagram illustrating the process of user registration and login.

Sequence diagram showing how a user navigates through the app to access course materials.

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

State-Transition Diagrams showcase the different states an object or system can be in and the events that trigger transitions between these states.

STD depicting the lifecycle of a user session, including login, active session, and logout states.

STD representing the progression of a user's progress through a course module, from not started to completed.

**4.3 Data Flow Diagrams (DFD)**

Data Flow Diagrams depict the flow of data within the system, showcasing how information is processed and transformed.

DFD illustrating the flow of user data during the registration process.

DFD showing the flow of course materials from the server to the user's device.

**5. Change Management Process**

This section outlines the process that will be followed to manage changes to the SRS document, project scope, or requirements.

Changes to the SRS can be proposed by any team member.

Proposed changes will be reviewed by the project leader and relevant team members.

Changes will be discussed and evaluated based on their impact on the project's goals and timeline.

Approved changes will be documented and updated in the SRS.

Updated versions of the SRS will be reviewed and approved by the project leader.

**A. Appendices**

Appendices provide additional information that supports the understanding and context of the SRS.

**Appendix 1: Sample user interface wireframes showcasing the app's design and layout.**

**Appendix 2: Detailed use cases for common user interactions within the app.**

**Appendix 3: Sample course curriculum and module breakdown.**