MAHATMA EDUCATION SOCIETY'S

PILLAI COLLEGE OF ARTS, COMMERCE & SCIENCE
(Autonomous)

NEW PANVEL

PROJECT REPORT ON

BOOK APPLICATION
IN PARTIAL FULFILLMENT OF

BACHELOR OF SCIENCE IN **INFORMATION TECHNOLOGY**

SEMESTER VI – 2023-24

PROJECT GUIDE
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1. Introduction

1.1 Purpose:

The purpose of the book application is to provide a platform for users to discover, read, and manage books digitally. It aims to offer a convenient and efficient way for users to access a wide range of books, both fiction and non-fiction, on their mobile devices. The scope of the application includes the following key features:

1. **User Registration and Authentication**: Users can create an account and log in securely to access the application's features.

2. **Book Browsing and Search**: Users can browse through a vast collection of books categorized by genre, author, and other criteria. They can also search for specific books using keywords.

3. **Book Details and Reviews**: Users can view detailed information about each book, including the title, author, description, and reviews from other users.

4. **Reading Options**: Users can choose to read books online or download them for offline reading. The application will provide a user-friendly reading interface with options to customize the reading experience.

5. **Bookmarking and Favourites**: Users can bookmark pages and add books to their list of favourites for easy access later.

6. **Social Sharing**: Users can share their favourite books or reading progress on social media platforms.

7. **Recommendations**: The application can suggest books based on the user's reading history and preferences.

8. **User Profile**: Users can manage their profile information, including their reading preferences and history.

9. **Accessibility Features**: The application will include features to enhance accessibility for users with disabilities, such as screen readers and adjustable font sizes.

10. **Security and Privacy**: The application will prioritize user security and privacy, ensuring that personal information and reading habits are protected.

Overall, the book application aims to provide a seamless and enjoyable reading experience for users, encouraging them to explore new books and authors while managing their reading preferences effectively.

1.2 Intended Audience and Reading Suggestion:

Our book application is for anyone who loves reading! It's perfect for:

1. **Readers:** If you enjoy books, whether it's fiction, non-fiction, or anything in between, this app is for you.

2. **Students:** If you're studying and need access to textbooks or reference materials, our app has you covered.

3. **Teachers and Librarians:** If you're looking for books to recommend to your students or library patrons, you'll find plenty of options here.

Reading Suggestions:

1. **Fiction:** Dive into exciting stories and make-believe worlds with our fiction books. From classic tales like "Alice in Wonderland" to modern adventures like "Harry Potter," there's something for everyone.

2. **Non-Fiction:** Learn new things and explore real-life topics with our non-fiction books. Whether you're interested in history, science, or self-help, you'll find interesting reads to expand your knowledge.

3. **Academic and Reference:** Students and researchers can find textbooks and reference materials for their studies. Whether it's math, science, or literature, we have resources to help you learn.

4. **Self-Help:** If you're looking to improve yourself or learn new skills, check out our self-help books. From tips on mindfulness to guides for personal development, you'll find helpful advice to reach your goals.

5. **Genre-specific Recommendations:** If you have a favourite genre like romance, mystery, or fantasy, we have curated suggestions just for you. Discover new books that match your interests and preferences.

1.3 Project Scope:

- **Inclusions:**
    1. **User Authentication:** Implement secure login and registration functionalities for users.
    2. **PDF Viewer Integration:** Incorporate a PDF viewer within the application to enable users to read books directly without downloading them separately.
    3. **Admin Panel:** Create an administrative interface with privileges to manage the book CatLog, including adding new books, editing existing entries, and organizing categories.
    4. **User Interaction Features:** Implement features for users to interact with books, such as liking, commenting, and sharing. Additionally, provide a rating system for users to provide feedback on books.
    5. **User Profiles:** Develop user profiles where individuals can manage personal information, preferences, and view their reading history and bookmarks.

- **Exclusions:**
    1. **Payment Functionality:** The application will not include features for purchasing books. All content will be freely accessible.
    2. **Social Media Integration:** Integration with external social media platforms for sharing content will not be included in the initial release.

- **Constraints:**
    1. **Timeframe:** The project must be completed within a specified timeframe, potentially impacting the depth and complexity of features implemented.
    2. **Budget:** Limited resources are available for development and testing, which may affect the scale of the project.

- **Assumptions:**
    1. Users will have consistent access to a stable internet connection for using the application.
    2. The application will primarily target desktop and mobile web platforms for accessibility.

- **Risks:**
    1. Technical challenges, such as implementing the PDF viewer or user authentication, may pose risks to the project's success.
    2. Uncertain user adoption and engagement levels could impact the application's popularity and usage.

- **Dependencies:**
    1. Availability of PDF book files for upload is crucial for populating the book CatLog.
    2. Compliance with legal requirements regarding copyright and intellectual property is essential to avoid legal issues related to content distribution.

1.4 Reference:

Software Requirement Specification

1. www.Microsoft.com

2. Software Testing Dorothy Graham book pdf

2. Overall Description

2.1 Product Perspective:

The book application operates as a stand-alone digital platform, providing users with easy access to a wide range of PDF books. It integrates seamlessly with existing authentication systems, offers scalability to accommodate growth, and ensures compatibility across various devices. While prioritizing user experience, it includes an administrative interface for managing content and user accounts. Overall, it serves as a versatile and user-friendly solution for discovering, reading, and interacting with books digitally.

1.2 Product features:
1. **User Authentication:** Secure login and registration.
2. **PDF Viewer:** Integrated reading of books.
3. **Admin Panel:** Management of books and categories.
4. **User Interaction:** Liking, commenting, and sharing.
5. **User Profiles:** Personalized settings and history.
6. **Search Functionality:** Finding specific books easily.
7. **Rating and Review System:** User feedback on books.
8. **Accessibility Options:** Adjustments for special needs.
9. **Offline Reading:** Download books for offline access.

1.3 User Classes and Characteristics:
- **Admin Function:**
    1. Login
    2. Add Category
    3. Add book pdf
    4. Edit Category
    5. Edit books pdf
    6. Edit description of book
- **User Function:**
    1. Login
    2. Search books
    3. Read books
    4. Download books
    5. Like books for giving reviews

1.4 Operating Environment:
- **Front End -** Xml
- **Back End -** Koltin
- **Database -** Firebase
- **Platform - Android** Studio

1.5 Design and Implementation Constraints:

- **Platform Compatibility:** Ensure the application works seamlessly across different devices and screen sizes.
- **PDF Viewing Limitations:** Address challenges in rendering large PDF files and ensure performance on various devices.
- **Security Requirements:** Implement robust user authentication and data security measures.
- **Data Storage and Management:** Develop scalable solutions for managing books, user accounts, and metadata.
- **Third-party Integrations:** Consider dependencies and potential limitations when integrating with external services.
- **Legal Compliance:** Adhere to copyright laws and licensing agreements for distributing digital content.
- **Performance Optimization:** Optimize performance through caching, lazy loading, and asynchronous processing.
- **Localization and Internationalization:** Support multilingual and localized content for users from different regions.

2. System Feature

3.1 Functional Requirements:

- **User Authentication:** Allow users to register and login securely. Provide password reset functionality.

- **Book CatLog:** Fetch book data from Firebase. Categorize books by genre, author, etc.

- **PDF Viewer:** Integrate a PDF viewer for reading books. Support zooming, scrolling, and bookmarking.

- **Admin Panel**: Enable admins to manage books and categories.

- **User Interaction:** Allow users to like, comment, rate, and share books.

- **User Profiles:** Provide personalized profiles for users.

- **Search Functionality:** Implement a search feature for finding books.

- **Accessibility Options:** Support adjustable font sizes and screen reader compatibility.

- **Offline Reading:** Allow users to download books for offline reading.

- **Social Sharing:** Enable sharing books on social media platforms.

- **Bookmarking and Note-taking:** Allow users to bookmark pages and add notes.

3. External interface Requirements

4.1 User Interfaces:

- **Login/Register Screen:** This screen allows users to either log in with their existing credentials or register for a new account. Fields for email address, password, and options for password recovery are provided.
- **Home Screen:** Upon successful login, users are greeted with the home screen. The home screen displays featured books, popular categories, and options for browsing the book CatLog.
- **Book CatLog Screen:** This screen presents users with a grid or list view of available books. Each book item includes the title, author, cover image, and options for interaction such as liking, commenting, and sharing.
- **Book Details Screen:** Users can access detailed information about a specific book by tapping on its title or cover image. This screen displays additional details such as the book description, rating, reviews, and options for reading or downloading the book.
- **Admin Panel:** Admins have access to a separate interface for managing books and categories. This panel includes forms for adding new books, editing existing entries, and organizing categories.
- **User Profile Screen:** Users can access their personalized profile screen to manage their account settings and preferences. This screen may include options for editing profile information, viewing reading history, managing bookmarks, and accessing purchased books.
- **Search Screen:** Users can utilize the search functionality to find specific books by title, author, or category. The search screen displays search results in real-time as users type their query.
- **Reading Interface:** When users select a book to read, the application opens the PDF viewer interface. The reading interface provides controls for zooming, scrolling, bookmarking, and navigating through pages.
- **Settings Screen:** Users can access a settings screen to customize app preferences such as font size, theme, and notification settings. Admins may also have access to additional settings related to content management and user permissions.

4.2 Hardware Interface:

- **Screen Display:** Utilizes the device's screen for UI.
- **Touchscreen Input:** Users interact via touch gestures.
- **Device Sensors:** Utilizes sensors for specific functions**.**
- **Storage Access:** Accesses device storage for book storage.
- **Network Connectivity:** Relies on network for data retrieval.
- **Battery Usage:** Optimizes battery consumption**.**
- **Camera Access:** Optional for specific functionalities.
- **Audio Output:** Uses device's audio capabilities.

4.3 Software Interface:

- **Android OS:** Runs on Android devices, utilizing Android APIs.
- **Android Studio IDE:** Developed using Kotlin and XML in Android Studio.
- **Firebase SDK:** Integrates Firebase services for authentication, database, and storage.
- **PDF Rendering Library:** Displays books using third-party PDF rendering libraries.

4.4 Communication Interfaces:

- **Firebase Authentication:** Enables secure authentication between the application and Firebase Authentication service. Handles user login, registration, and password reset operations securely.
- **Firebase Database:** Facilitates real-time data synchronization between the application and Firebase database. Allows for seamless retrieval and storage of book CatLog data, user profiles, and interaction data (likes, comments, ratings).
- **Firebase Storage:** Manages communication for uploading and downloading book files between the application and Firebase Storage. Ensures efficient storage and retrieval of PDF book files for users to read.

4. Nonfunctional Requirements

5.1 Performance Requirements:
- **Responsiveness:** The application should respond promptly to user actions, ensuring smooth navigation and interaction with minimal delays.
- **PDF Rendering Speed:** Pages in the PDF viewer should load quickly and smoothly, allowing users to read books without interruptions or lags.
- **Network Performance:** Network requests for fetching book data and files should have low latency, providing a seamless browsing experience. The application should hand intermittent connectivity by gracefully managing offline scenarios and caching data efficiently.
- **Offline Support:** Downloaded books should be accessible offline without significant delays, with seamless synchronization when the device reconnects to the internet.
- **Scalability:** The application should scale effectively as the user base and content library grow, maintaining consistent performance even with increased load.
- **Battery Efficiency:** The application should optimize battery consumption to ensure extended usage without draining the device's battery excessively.
- **Memory Management:** Efficient memory usage is crucial to prevent crashes and maintain performance, requiring careful management of resources and avoiding memory leaks.
- **Compatibility:** The application should be compatible with a wide range of Android devices, adapting to different screen sizes and resolutions while delivering consistent performance.

4.2 Security Requirements:
- **User Authentication:** Secure handling of user credentials with encryption and 2FA options.
- **Data Encryption:** Encryption of sensitive data during storage and transmission.
- **Authorization Controls:** Role-based access control for user permissions and admin-exclusive features.
- **Secure Data Storage:** Implementation of strict access controls and encryption for stored data.
- **Secure Communication with Firebase:** Utilization of Firebase security features to prevent unauthorized access.
- **Data Backup and Recovery:** Regular backups and disaster recovery procedures to prevent data loss.
- **User Privacy Protection:** Compliance with privacy regulations and minimal collection of personal data.

4.3 Software Quality Attributes:

- **Reliability:** Ensure the application functions correctly without unexpected crashes or errors. Maintain consistent performance under varying conditions**.**
- **Usability:** Provide an intuitive and user-friendly interface for easy navigation and interaction. Ensure accessibility features for users with different abilities.
- **Performance:** Optimize speed and responsiveness for smooth operation, including fast loading times and quick response to user inputs. Efficiently utilize device resources to minimize battery usage and memory consumption.
- **Security:** Implement robust authentication and authorization mechanisms to protect user data and prevent unauthorized access. Encrypt sensitive information and ensure compliance with privacy regulations.
- **Scalability:** Design the application to handle increasing user load and data volume without sacrificing performance. Scale resources dynamically to accommodate growth in user base and content.
- **Maintainability:** Write clean, modular, and well-documented code to facilitate ease of maintenance and future enhancements. Regularly update dependencies and address technical debt to keep the application up-to-date.
- **Testability:** Develop comprehensive test suites for automated testing to ensure the application functions as intended. Conduct thorough testing across different devices, screen sizes, and operating system versions.
- **Portability:** Design the application to be compatible with various Android devices, screen resolutions, and operating system versions. Ensure consistent performance and functionality across different platforms and device configurations.

❖ BOUNDARY VALUE ANALYSIS:

Case: - In the Book Application, the password for logging in must consist of numerical characters and have a minimum length of 8 digits and a maximum length of 12 digits. This requirement has been subjected to Boundary Value Analysis (BVA).

➢ Just below minimum value -7
➢ Minimum value -8
➢ Just above the minimum -9
➢ Nominal Value -10
➢ Just below Max value-11
➢ Max value -12
➢ Just above Max value -13

Test Scenario Expected Outcome:

Input	Expected Output	Actual Output	Result
7	Not Allowed	-	-
8	Allowed	-	-
9	Allowed	-	-
10	Allowed	-	-
11	Allowed	-	-
12	Allowed	-	-
13	Not Allowed	-	-

❖ **EQUIVALENCE PARTITIONING (EQP):**

Case: In the Book Application, the password for logging in must consist of numerical characters and have a minimum length of 8 digits and a maximum length of 12 digits. So, making 3 classes for that.

Length of password	Test Result
8 < Password < 12	Valid
Password>12	Invalid
Password<8	Invalid

Input	Expected Output	Actual Output	Result
123456789	Valid	-	-
2456	Invalid	-	-
99878719509276	Invalid	-	-

❖ **EQUIVALENCE PARTITIONING (EQP):**

❖ **DECISION TABLE:**

Case: - In our application, the process of uploading a PDF file requires the following information from the admin: book title, book description, book category, and the PDF file itself. Only when all of these required elements are provided can the PDF file be successfully uploaded. Failure to provide any of these elements will result in an unsuccessful upload of the PDF file.

Book Title	Book Description	Book Category	Book pdf	Uploading Pdf
Present	Present	Present	Present	Successful
Absent	Present	Present	Present	Unsuccessful
Present	Absent	Present	Present	Unsuccessful
Present	Present	Absent	Present	Unsuccessful
Present	Present	Present	Absent	Unsuccessful
Present	Present	Absent	Absent	Unsuccessful
Present	Absent	Present	Absent	Unsuccessful
Present	Absent	Absent	Present	Unsuccessful
Absent	Present	Present	Absent	Unsuccessful
Absent	Present	Absent	Present	Unsuccessful
Absent	Absent	Present	Present	Unsuccessful
Absent	Absent	Absent	Present	Unsuccessful
Present	Absent	Absent	Absent	Unsuccessful
Absent	Present	Absent	Absent	Unsuccessful
Absent	Absent	Present	Absent	Unsuccessful
Absent	Absent	Absent	Absent	Unsuccessful

No. of rules: -16

Conditions	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R 12	R 13	R 14	R 15	R 16
C1: Book Title is present	T	F	T	T	T	T	T	T	F	F	F	T	F	F	F	F
C2: Book description is present	T	T	F	T	T	T	F	F	T	T	F	F	T	F	F	F
C3: Book Category is present	T	T	T	F	T	F	T	F	T	F	T	F	F	T	F	F
C4: Book Pdf is present	T	T	T	T	F	F	F	T	F	T	T	F	F	F	T	F
A1: Uploading Successful	✓															
A2: Uploading Unsuccessful		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

❖ STATE TRANSITION TESTING:
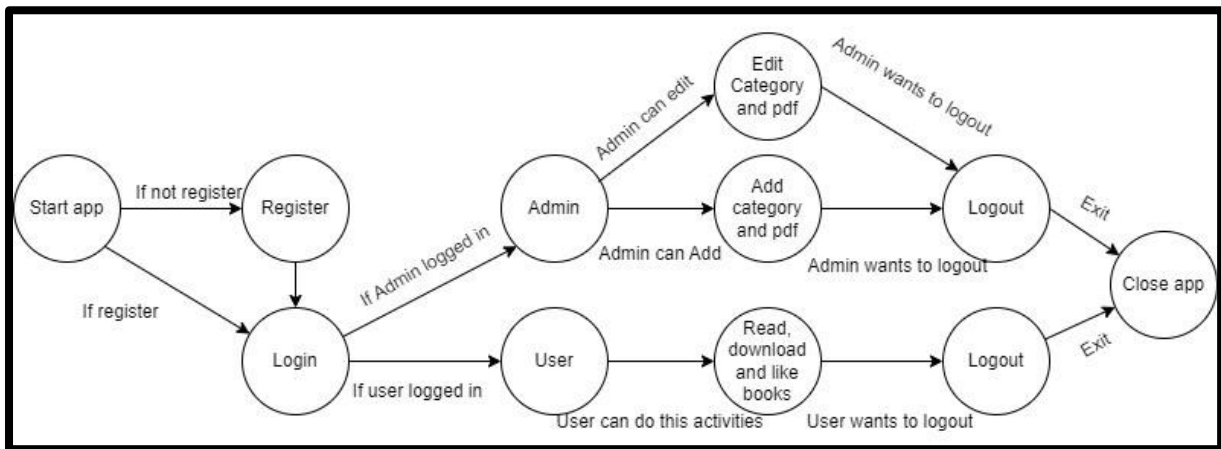
	Valid	**Invalid**
S1) Start App	S2	-
S2) Register	S4, S5	S3
S3) Login	-	S2
S4) User	S8	S3
S5) Admin	S7, S6	S3
S6) Edit Category and pdf	S5	-
S7) Add category and pdf	S5	-
S8) Read, Download and like	S4	-
S9) Logout	S1	-
S10) Close App	S1 (If again open app)	-

❖ **USE CASE TESTING:**

Sr.No	Form name	Test Condition	Test	Input & data	Expected result	Actual Output	Pass/fail
1	Login	Verify that the user can login to the system with valid credentials	Correct name and password	Username: Admin Password: 180803	The user should be logged in to the system	The user should be logged in to the system	Pass
2	Login	Verify that the user cannot login to system with invalid credentials	Wrong username and password	Username: Admin Password: 123456	The user should see an error message indicating that their login information is incorrect	The user should see an error message indicating that their login information is incorrect	Pass
3	Admin	That admin can edit and add book pdf, category, title and description	Book titles, category, description and pdf can be edited and can be added as well	Book title: C++ Book desc: Programming book Book category: General Pdf: Attach pdf	The admin should get pop up message if any thing is left out to fill	The admin get message to see if any thing is left to fill	Pass
	Admin	That admin can edit and add book pdf, category, title and description	Book titles, category, description and pdf can be edited and can be added as well	Book title: C++ Book desc: Programming book Book category: General Pdf: Attach pdf	The admin should get successful message if he/she filled correct info	The admin get message of successful	pass