

SMARTTUTOR: An Offline Adaptive Study Planner Platform

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ABSTRACT: The rapid growth of digital learning platforms has transformed the way students access educational resources. However, most existing systems follow a uniform learning approach that does not consider individual learning pace, understanding level, or available study time. This lack of personalization often leads to inefficient learning, poor time management, and reduced student engagement. To address these challenges, this project proposes SMARTTUTOR Offline Study Planner, an intelligent and adaptive learning system designed to provide personalized study planning without relying on internet connectivity. The system allows users to upload textbook PDF documents, from which important topics are extracted using Natural Language Processing(NLP) techniques such as tokenization and TFIDF. Based on the extracted content, a smart scheduling algorithm generates structured daily and weekly study plans tailored to the learner's preferences and available time. In addition, the system includes features such as topic based quiz generation, performance tracking, and a reward mechanism using badges to enhance motivation and consistency. The offline functionality ensures accessibility for users in low-connectivity areas, making the system practical and widely usable. Overall, SMART TUTOR improves self-paced learning by combining intelligent content analysis, adaptive scheduling, and performance evaluation, providing an efficient and user-friendly solution for modern education.

I. INTRODUCTION

In the present educational environment, digital learning platforms play an important role in supporting students' academic growth. Many students rely on online resources, e- books, and digital study materials for exam preparation and skill development. However, most traditional digital learning systems follow a common study pattern for all learners. This uniform approach does not consider individual learning speed, understanding level, or personal academic goals. As a result, students may feel less engaged and struggle to follow a fixed study schedule. Every learner has a different pace of learning. Some students require additional time to understand certain topics, while others can complete lessons quickly. A personalized learning system is therefore necessary to improve effectiveness and motivation. There is a need for an intelligent system that can automatically organize study materials and generate structured plans based on a learner space and available time. To address this issue, SMARTTUTOR–Offline Study Planner is proposed as an offline adaptive learning system. The system allows users to upload textbook PDF documents, from which important content is extracted using Natural Language Processing(NLP) techniques such as tokenization and TF-IDF.

Based on the extracted topics, a smart scheduling algorithm prepares daily and weekly study plans. In addition to schedule generation, the system also creates topic- based quizzes, tracks user performance, and awards badges to encourage continuous learning. A major advantage of SMARTTUTOR–Offline study Planner is its complete offline functionality, making it suitable for students in low connectivity areas. By integrating intelligent content analysis, adaptive scheduling, and motivational features, SMARTTUTOR–Offline Study Planner enhances self-paced learning and provides an efficient and accessible study solution.

II. EXISTINGSYSTEM

In the current educational environment, students mainly depend on traditional digital learning platforms, online courses, and manual study planning methods. Although these systems provide access to learning materials, they have several limitations. Most existing systems follow a fixed study structure for all learners. They do not adapt to individual learning speed, performance level, or academic goals. Students are required to manually create their own schedules, which may not be structured or balanced. This often leads to improper time management and incomplete syllabus coverage. Another major limitation of existing systems is the lack of intelligent content extraction. When students upload or access study materials, the system does not automatically analyse or prioritize important topics. Learners must manually identify key concepts, which can be time-consuming and inefficient. Additionally, many digital learning platforms require continuous internet connectivity. Students in rural or low network areas face difficulty accessing these systems, which interrupts their learning process. Internet dependency becomes a major barrier to consistent study. Most platforms also provide limited performance tracking and motivational mechanisms. Without proper feedback, quizzes, or rewards, learners may lose engagement and fail to maintain regular study habits.

Limitations of Existing System

- Uniform study pattern for all learners.
- No personalized scheduling mechanism.
- Manual identification of important topics.

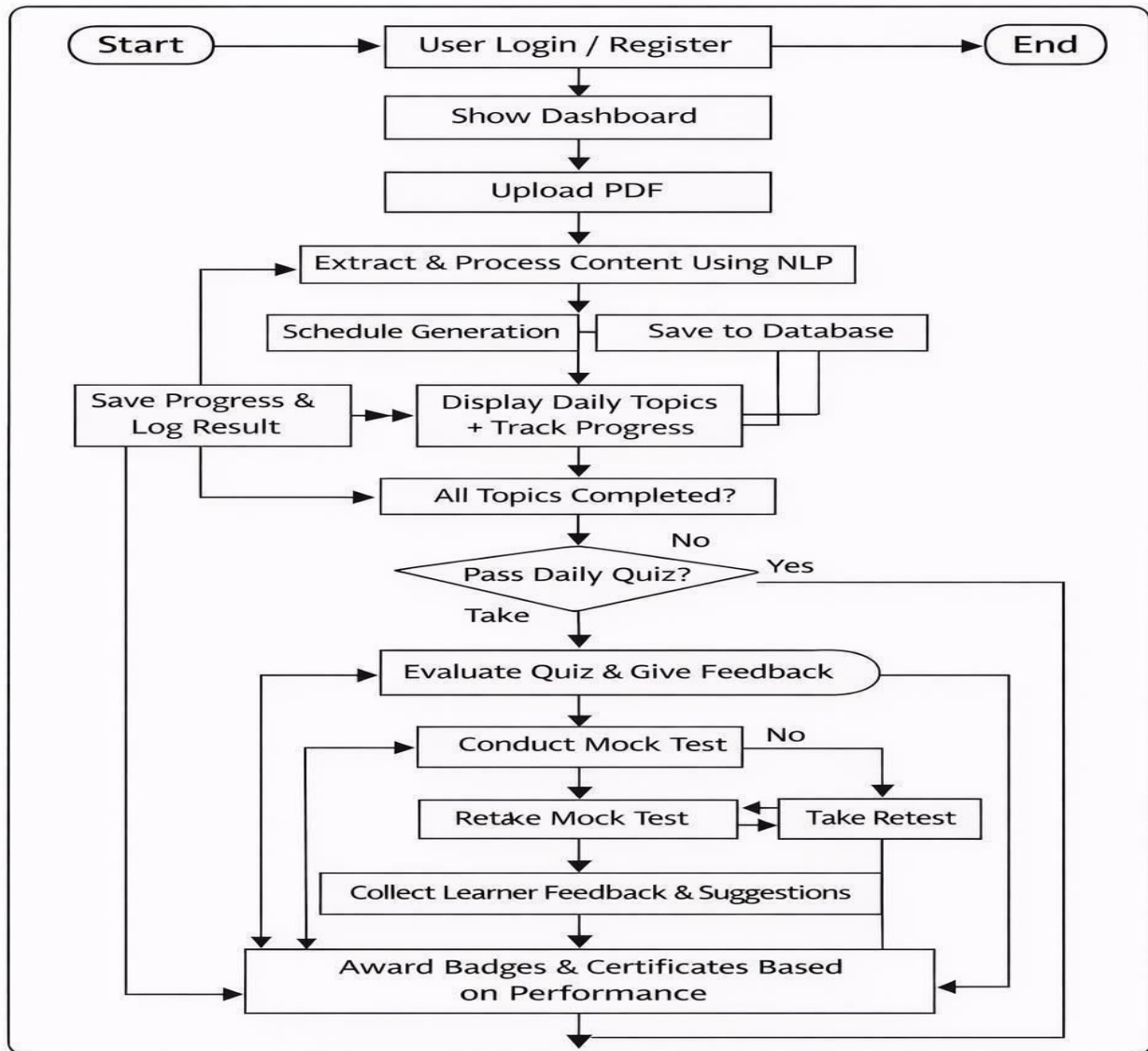
III. PROPOSEDSYSTEM

To overcome the limitations of existing systems, SMARTTUTOR – Offline Study Planner is proposed as an offline adaptive learning platform. The system is designed to provide personalized study plans and intelligent content processing. SMART TUTOR allows users to upload textbook PDF documents. Using Natural Language Processing (NLP) techniques such as tokenization and TF-IDF, the system extracts key topics and organizes them efficiently. A smart scheduling algorithm then distributes these topics into structured daily and weekly study plans based on the learner's available time and goals. The system also includes topic-based quiz generation to evaluate learner understanding. Performance tracking features allow Students to monitor their improvement over time. To enhance motivation, a badge-based reward system is integrated. A major advantage of the proposed system is its complete offline functionality. It works without requiring continuous internet access, making it suitable for rural and low-connectivity environments.

Advantages of proposed system

1. Personalized and adaptive study planning.
2. Automatic content extraction using NLP techniques
3. Smart scheduling algorithm for balanced study plans.
4. Quiz generation and performance monitoring
5. Offline accessibility for un interrupted learning

IV. SYSTEMARCHITECTURE



Modules

The SMART TUTOR system is divided into the following functional modules:

1. User Authentication Module
2. Dashboard Module
3. Course Management Module
4. PDF Upload and Processing Module
5. Schedule Generation Module
6. Daily Learning Module
7. Quiz Module
8. Mock Test Module
9. Feedback Module
10. Reward and Badge Module.

V. MODULE DESCRIPTION**1. User Authentication Module**

This module manages user registration and login functionality. New users can create an account by providing necessary details such as name, email, and password, while existing users can log in securely to access their personalized dashboard. The module ensures proper input validation and basic password verification to maintain secure access. It also maintains individual user data separately so that personalized schedules, quiz scores, and progress records are stored uniquely for each user.

2. Dashboard Module

After successful login, users are directed to the dashboard, which acts as the central control panel of the system. It displays ongoing courses, newly uploaded courses, and completed courses in a structured manner. The dashboard provides quick navigation to upload, schedule, and quiz sections while also showing overall progress status and completion percentage. It dynamically updates based on user activity.

3. Course Management Module

This module manages the life cycle of each course from upload to completion. It categorizes courses as new, ongoing, or completed based on user progress. The system automatically updates course status after daily task completion and maintains a history of completed courses for future reference and review.

4. PDF Upload and Processing Module

In this module, users upload textbook PDF files for study planning. The system extracts textual content from the PDF and applies NLP techniques such as tokenization and TF-IDF to identify important topics and keywords. It also performs text cleaning by removing stop words and irrelevant symbols to ensure accurate topic extraction. The processed content is then organized for schedule generation.

5. Schedule Generation Module

After processing the uploaded content, the system asks the user to enter the number of study days and available daily study time. Based on this input, a smart scheduling algorithm distributes topics evenly across the selected days. The system ensures balanced workload distribution and prevents topic overloading by considering time allocation and topic difficulty.

6. Daily Learning Module

For each scheduled day, the system displays the assigned topics based on the generated study plan. Learners can go through the content in a structured manner and mark the day as completed after finishing the topics. The module tracks daily study consistency and maintains a study streak record to encourage regular learning habits. It also ensures that incomplete topics can be revisited before moving to the next day, thereby maintaining learning continuity. Progress is automatically updated in the dashboard to reflect real-time course completion status.

7. Quiz Module

At the end of each learning day, the system generates topic-based quizzes to evaluate user understanding. The questions are derived from the extracted content to ensure relevance to the studied material. The module automatically calculates quiz scores and provides instant feedback to the learner. It highlights correct and incorrect answers to improve conceptual clarity. Quiz performance data is stored systematically to analyse progress trends over multiple days and identify weak areas for improvement.

8. Mock Test Module

On the final scheduled day, the system conducts a comprehensive mock test covering all previously learned topics. The test is designed to simulate real examination conditions with a structured format and time based assessment. This module evaluates overall knowledge retention and application ability. After completion, a detailed performance summary is generated, including total score, accuracy percentage, and topic-wise analysis. The mock test results contribute significantly to final performance evaluation and reward allocation.

9. Feedback Module

After completing the mock test, users are prompted to provide feedback regarding their learning experience, system usability, and difficulty level of the course. This module collects qualitative inputs such as ratings and suggestions for improvement. The feedback data is securely stored and can be used to enhance future versions of the system. It also helps in understanding user satisfaction and identifying areas where the learning flow can be optimized.

10. Reward and Badge Module

Based on quiz performance, mock test results, daily consistency, and overall completion, the system awards digital badges and achievement certificates to learners. The module recognizes milestones such as completing all scheduled days without interruption or scoring above a certain percentage. This reward mechanism enhances motivation and encourages continuous engagement. It also visually represents achievements within the dashboard, reinforcing a sense of accomplishment and boosting learner confidence.

VI. RESULT

1. Login Page

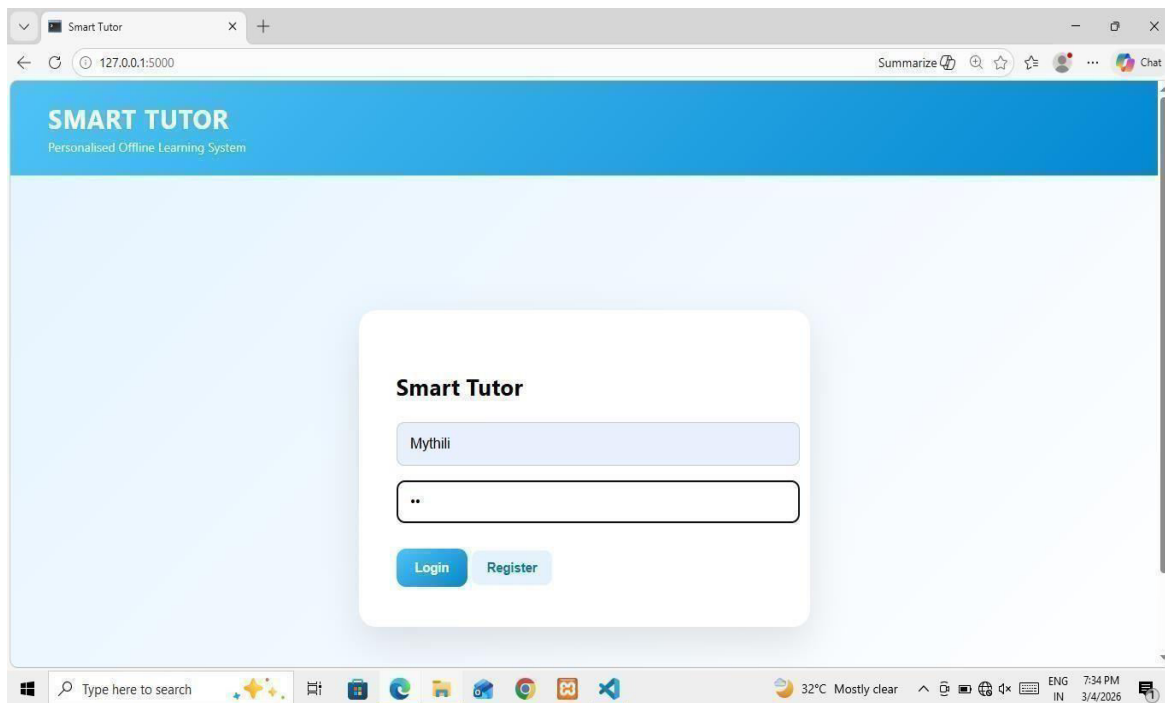


Fig No: 6.1

2. Schedule page

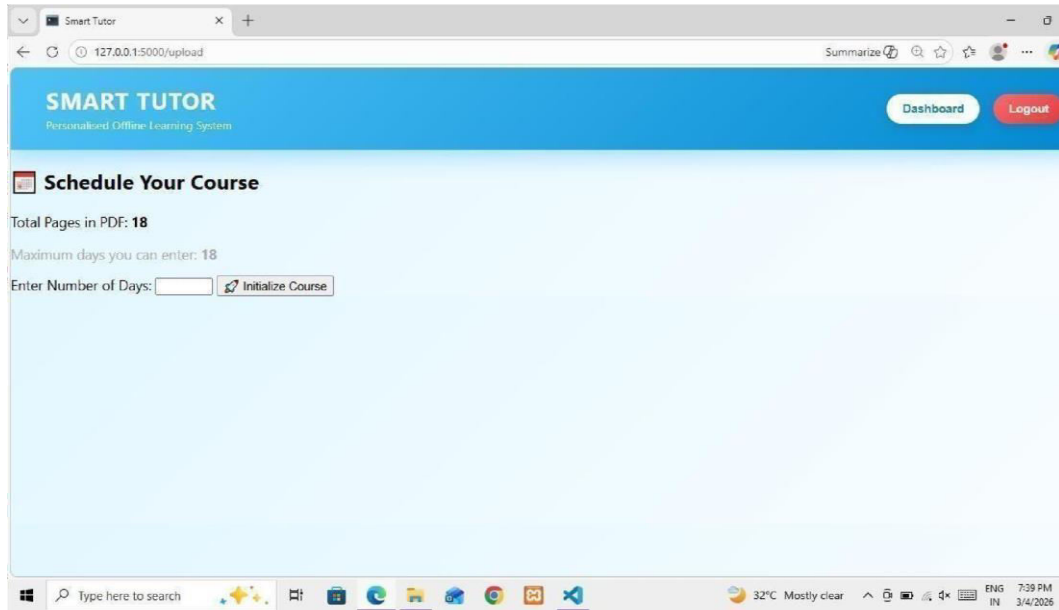


Fig No: 6.2

3. Overall Report

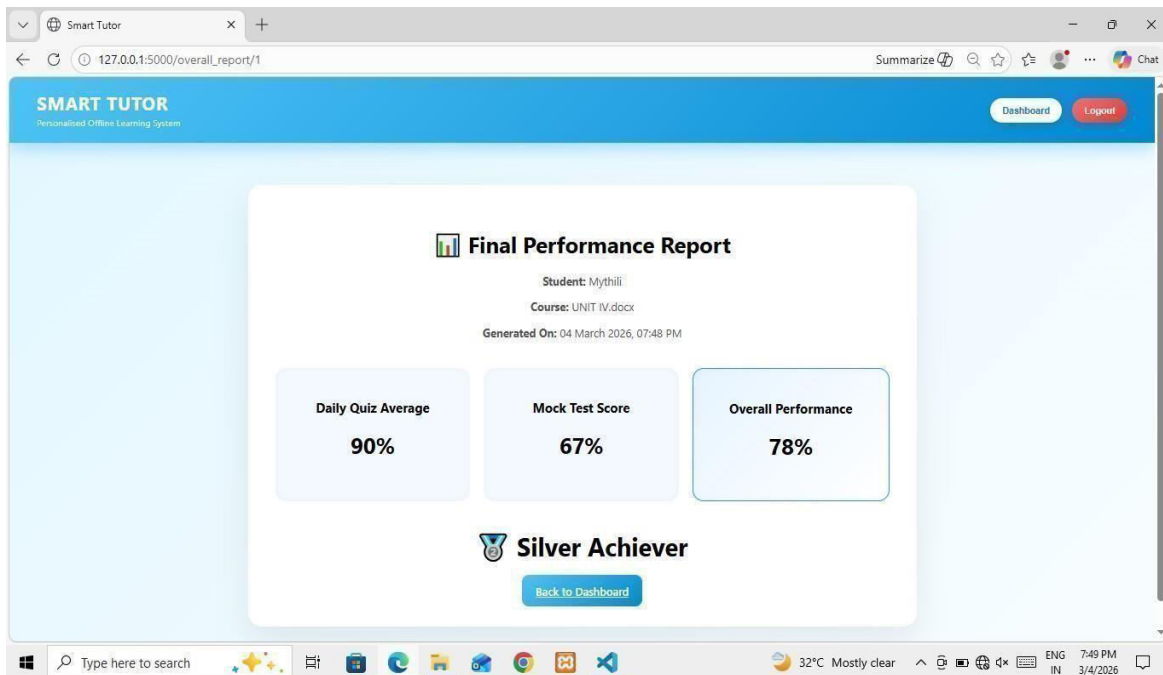


Fig No : 6.3

VI. CONCLUSION

The SMART TUTOR system is developed to provide a structured and intelligent learning environment for students. The system helps learners organize their study materials and generate personalized study schedules based on the uploaded content. By using Natural Language Processing techniques such as tokenization and TF-IDF, the system extracts important topics from PDF documents and distributes them into a day-wise learning schedule. The system also includes daily quizzes and a final mock test to evaluate learner understanding and track performance. In addition, the reward and badge mechanism encourages learners to stay motivated and maintain consistency in their study routine. The user-friendly interface allows learners to easily upload study materials, follow learning schedules, and monitor their progress. Overall, SMART TUTOR provides an effective solution for improving self-learning and study management.

VII. FUTURE ENHANCEMENT

In the future, the SMART TUTOR system can be improved by integrating advanced artificial intelligence techniques for better content analysis and personalized learning recommendations. Cloud integration can also be implemented to allow users to access their study data from multiple devices. Additional features such as teacher dashboards, real-time progress monitoring, mobile application support, and notification reminders can further enhance the usability of the system. With these improvements, SMART TUTOR can evolve into a more advanced and comprehensive adaptive learning platform.

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