

# Smart Learning Planner

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**Abstract-** Effective study planning is important for academic success, yet students who manage multiple subjects, assignments, and examinations often find it difficult to monitor their progress consistently using manual methods. This paper presents the Smart Learning Planner, a web-based system that provides a centralized platform for academic activities. The system supports structured learning plans, task management, examination preparation using priority calculations, progress tracking, and analytics. It is developed using React, Vite, and Tailwind CSS for the frontend, Flask for the backend, and SQLite with SQLAlchemy for data storage, with the modules communicating through a REST API. The system helps students compare estimated and actual study time and review their learning progress in one place.

**Keywords-** Study planning, examination priority, task management, progress tracking, learning analytics, web application.

## I. INTRODUCTION

Effective study planning is important for academic success. Students often manage multiple subjects, assignments, and examinations at the same time, and manual planning makes it difficult to monitor progress consistently.

The Smart Learning Planner provides a centralized platform for academic activities. It supports structured study plans, task management, examination preparation, and progress analytics, so that students can organize their study time and review their learning progress from a single application.

## II. PROBLEM STATEMENT

Students face difficulties in managing study time, prioritizing subjects, completing academic tasks, and preparing for examinations. Traditional methods may require students to maintain separate timetables, task lists, and progress records.

The problem addressed in this work is: *to develop a web-based system that simplifies academic planning, supports examination prioritization, and tracks student learning progress through a centralized application.*

## III. OBJECTIVES

- To develop a centralized academic planning platform.
- To create structured learning plans and study tasks.
- To support examination preparation using priority calculations.
- To monitor task completion and study hours.
- To compare estimated and actual study time.
- To provide analytics for reviewing learning progress.
- To improve study organization and time management.

## IV. EXISTING SYSTEM

At present, students use paper timetables, notebooks, and basic digital calendars for planning. The existing approach has the following limitations:

- Study tasks are often managed separately from examination schedules.
- Progress tracking may require manual calculations.
- Prioritizing subjects can be difficult when multiple examinations are approaching.
- Comparing planned study hours with actual effort may be inconvenient.

## V. PROPOSED SYSTEM

The proposed Smart Learning Planner overcomes these limitations by providing one platform for academic study planning. The system:

- Allows students to create and manage learning plans.
- Organizes study activities into smaller tasks.
- Calculates examination priorities using academic information.
- Records task status and actual study hours.
- Provides progress analytics and planned-versus-actual comparisons.

## VI. LITERATURE SURVEY

Existing research in personalized education, learning analytics, self-regulated learning, and adaptive scheduling was

studied before designing the proposed system. Table 1 summarizes the key findings of each research area, the gap or limitation identified, and how the present project addresses it.

**Table 1: Literature Survey Summary**

| SL No. | Research Area                                | Key Findings                                                                             | Research Gap / Limitation                                                                            | Our Project                                                                               |
|--------|----------------------------------------------|------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| 1      | Personalized Education                       | Uses student data and preferences to provide personalized learning experiences.          | Many systems use complex learner models and recommendation algorithms.                               | Uses marks, credits, and examination dates for simple and explainable personalization.    |
| 2      | Educational Data Mining & Learning Analytics | Analyzes educational data to support decision-making and understand student progress.    | These systems may require large datasets and complex analysis.                                       | Provides simple analytics such as completion percentage, study hours, and study timeline. |
| 3      | Self-Regulated Learning                      | Highlights the importance of planning, monitoring, and managing learning activities.     | Students may understand the importance of planning but struggle to create practical daily schedules. | Converts student inputs into a structured daily study plan.                               |
| 4      | Adaptive Scheduling                          | Allocates study time based on factors such as weakness, urgency, and subject importance. | Complex scheduling approaches can be difficult to understand and explain.                            | Uses a simple and explainable priority-based scheduling method.                           |

## VII. SYSTEM REQUIREMENTS

### A. Hardware Requirements

- Computer or laptop
- Modern Intel or AMD processor
- Minimum 4 GB RAM; 8 GB recommended
- Sufficient storage space

### B. Software Requirements

- **Operating system:** Windows or compatible OS
- **Programming languages:** Python and JavaScript
- **Frontend:** React, Vite, Tailwind CSS
- **Backend:** Flask
- **Database:** SQLite
- **ORM:** SQLAlchemy
- **Communication:** REST API
- **Browser:** Chrome or another modern browser

## VIII. SYSTEM ARCHITECTURE

The overall architecture of the Smart Learning Planner is shown in Fig. 1. A student interacts with the system through a web interface built with React (Vite) and Tailwind CSS. The frontend provides the Dashboard, Add Subjects, View Schedule, Study Tracker, and Analytics screens.

The frontend communicates with a Flask (Python) backend through a REST API. The backend contains the User Management, Plan Generation Engine, Priority Calculation Algorithm, Schedule & Tasks, and Progress & Reports components. All data, namely users, subjects, plans, tasks, and study logs, is stored in an SQLite database accessed through SQLAlchemy.

The core algorithm takes the input data (internal marks, maximum marks, credits, and dates), performs the

priority calculation ( $\text{credits} \times \text{weakness} \times \text{urgency}$ ), and then prepares a smart schedule based on the available hours and deadlines. The output of the system is a personalized study plan, a daily/weekly schedule, a task list with reminders, progress tracking, and performance insights.

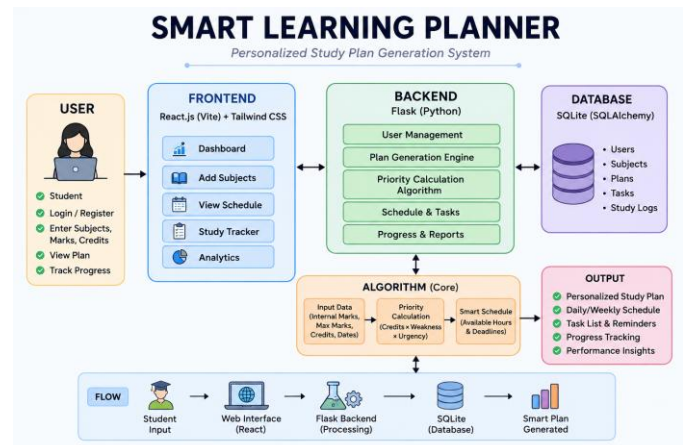


**Fig. 1: System Architecture of the Smart Learning Planner**

## IX. MODULES OF THE SYSTEM

- **Learning Plan Management:** Creates study plans with titles, descriptions, difficulty levels, daily hours, and duration.
- **Task Management:** Organizes learning goals into tasks with durations and completion status.
- **Exam Planner:** Stores subject details, internal marks, credits, examination dates, and available study hours.
- **Priority Calculation:** Calculates scores to help organize examination preparation.
- **Progress Tracking:** Records task completion, actual study hours, and notes.
- **Analytics:** Displays completion rates, time comparisons, and progress trends.

## X. METHODOLOGY

The system was developed in the following stages:

1. Requirement analysis
2. System architecture design
3. Frontend development
4. Backend API development
5. Database design and integration
6. Implementation of study planning and priority calculations
7. Integration of all modules
8. Functional testing
9. Result analysis and evaluation

The working of the system is shown in the flowchart in Fig. 2. The student enters the planning information, which is validated; an error message is shown if the input is not valid. For valid input, the system analyzes the academic information, calculates the weakness and exam urgency, and then calculates the priority weight of each subject. Daily study hours are allocated and a study schedule is generated. The student then tracks tasks and study logs, and the system displays progress and analytics.

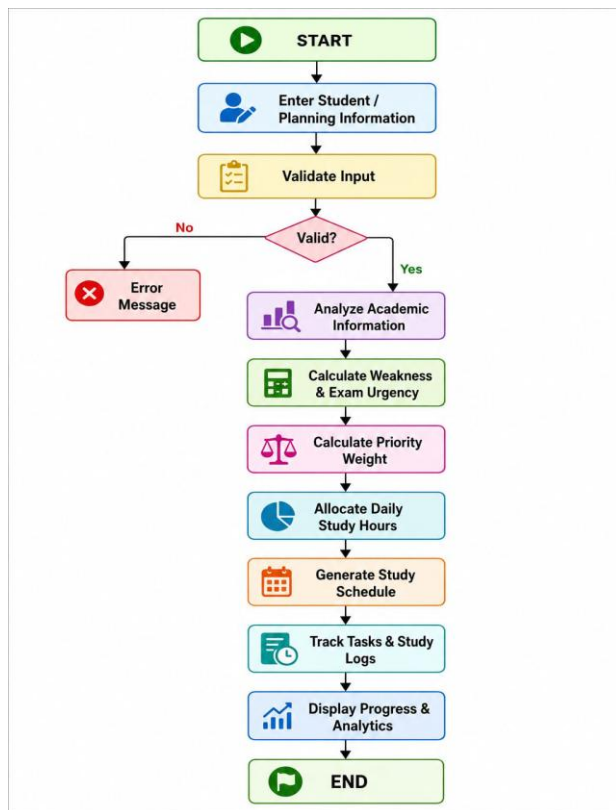


Fig. 2: Flowchart of the Smart Learning Planner

## XI. RESULTS AND DISCUSSION

The developed Smart Learning Planner provides a centralized interface for study planning. The results observed from the system are as follows:

- It provides a centralized interface for study planning.
- It organizes academic tasks into manageable activities.
- It supports examination preparation using calculated priorities.
- It tracks task completion and study-hour records.
- It helps students compare estimated and actual study time.
- It provides a basis for reviewing study progress.

Fig. 3 shows the Exam Study Planner screen. For the sample entry, the date was 25/08/2026 with 4 study hours available per day. Two subjects were added: data structures (internal marks 50 out of 100, 4 credits, exam on 01/09/2026) and computer network (internal marks 70 out of 100, 3 credits, exam on 03/09/2026). After the study schedule was generated, the Subject Overview showed 22 hours planned for data structures and 10 hours for computer network, and the Day-by-Day Schedule for Tuesday, 25/08/2026 allotted 2.96 hours to data structures and 1.04 hours to computer network.

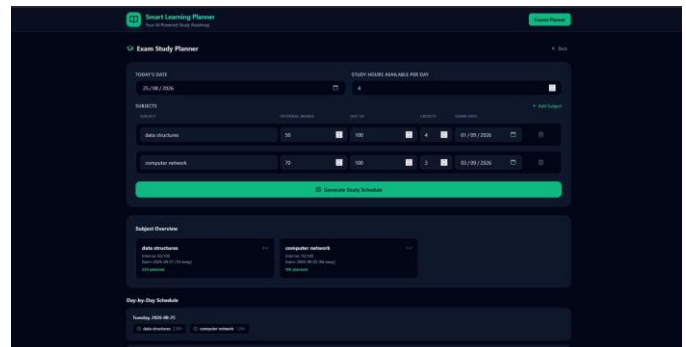


Fig. 3: Exam Study Planner – Generating the Study Schedule

## XII. CONCLUSION

The Smart Learning Planner provides an integrated platform for study planning, task management, examination preparation, and learning progress tracking.

The system combines web technologies, database management, rule-based priority calculations, and analytics to help students organize their academic activities. It offers a foundation for more personalized and adaptive study planning in the future.

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