

# AcadNexus FutureAI: A Smart Study Planner and Career Guidance Web Platform

Mr. B B Neelakantappa  
Malnad College of Engineering  
Hassan, Karnataka  
bbn@mcehassan.ac.in

Ashik Mathew  
Malnad College of Engineering  
Hassan, Karnataka  
mathewashik337@gmail.com

C Veda  
Malnad College of  
Engineering Hassan,  
Karnataka  
cveda7662@gmail.com

Chithritha M K  
Malnad College of Engineering  
Hassan, Karnataka  
chithrithamk2005@gmail.com

Kishan Kumar H V  
Malnad College of Engineering  
Hassan, Karnataka  
kishankumarhv5@gmail.com

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**Abstract** - Being a college student today is incredibly stressful because you are constantly forced to juggle two massive goals at the same time. On one hand, you are just trying to survive the daily grind of heavy classes, endless homework, and tough exams. On the other hand, you are expected to figure out your entire future and map out a successful career so you can land a good job right after graduation. Students end up using basic calendar apps just to track their homework deadlines, and then jumping over to completely separate websites to get career advice. This makes no sense, because how you study and perform in your classes today is exactly what shapes your job opportunities tomorrow. To fix this and make college life much easier, we created a single website called **AcadNexus FutureAI**. It acts like an intelligent, 24/7 assistant that connects your daily study habits directly with smart career guidance. If you miss a study session because you get sick, have an emergency, or just run out of energy, the system doesn't let you fall behind. Instead, it automatically reschedules that missed work across your future free time slots, preventing a stressful mountain of homework from piling up. At the exact same time, the platform works as your personal career guide. It skips those generic, boring personality quizzes that give everyone the same basic advice. Instead, it tests your actual logic, problem-solving skills, and real interests. Once it understands your unique strengths, it looks at live, up-to-date job market data to match your talents with high-demand fields that are actively hiring right now. It gives you the peace of mind you need to boost your grades today, while helping you build a clear, reliable path toward a great career tomorrow.

**Key Words:** adaptive study planning, career guidance, aptitude assessment, AI-based recommendation, academic management, timetable generation, personalization, React, MongoDB.

## I. INTRODUCTION

Being a college student today can feel like a non-stop, exhausting juggling act. Every semester, students are forced to deal with two massive sources of stress at the exact same time. First, they have to survive the daily grind of heavy classes, never-ending homework, and tough exams just to get by. Second, they have to carry the scary weight of figuring out what they want to do with the rest of their lives after graduation. Dealing with either of these pressures is hard enough on its own, but trying to handle both at once leaves many students feeling completely burned out and overwhelmed.

The biggest problem is that the technology we use today makes this problem worst. Right now, various apps treat schoolwork and career planning as if they have nothing to do with each other. A student has to use one basic calendar app just to keep track of their assignment deadlines, and then jump over to a completely different website or visit a campus office just to get job advice. This disconnected setup makes no sense because, in the real world, your everyday classes and your future job are deeply tied together.

The truth is, what you want to do for a become later should directly change how you spend your time studying right now. For example, if you want to become a data scientist, you need to spend extra hours focusing heavily on mathematics, analysing tools and computer coding. If you want to run a business, your daily energy should go toward learning communication and leadership. Your everyday study routine should always match up with your big future goals. Sadly, current software completely misses this obvious link, leaving students totally on their own to figure out how their college classes actually fit into the real-world job market.

## II. LITERATURE SURVEY

Right now, the apps and tech built for students are split into two totally different worlds. On one side, you have

smart programs that give big-picture career advice. On the other side, you have digital tools that just help students get through their daily homework. To see what these tools can actually do and where they fail - someone took a close look at six important research papers. These studies showed how software can suggest paths, how learning can be shaped for one person, how to find a student's natural strengths, and even how to make school schedules automatically.

Looking at all this research makes one big problem very clear: today's software forces students to split their lives into separate boxes. A student has to use one app to handle tomorrow's homework, and a completely different tool to figure out what they want to do with their life. You almost never find one system that connects the two. This exact missing link is why AcadNexus FutureAI was made. It finally brings those two worlds together, connecting daily schoolwork directly to a student's long-term dreams.

**Rule-Based Expert Systems for Career Guidance:** Supriyanto et al. [1] developed one of the clearer early matching. Their system applied forward chaining inference rules to take student interest profiles as input and match them against predefined career categories. The logic was transparent and easy to explain to students. However, the system was limited by its static rule base — it could not adapt to changes in what the job market actually wanted, and it had no mechanism for handling aptitude data or academic performance. Awi Godwin Ijuptil et al. [3] built on this foundation by combining a Rule-Based Expert System with Decision Tree classification and Fuzzy Logic to handle cases where student profiles did not fit neatly into fixed categories. The limitation was that recommendation outputs were still largely drawn from a fixed career catalogue rather than anything dynamically updated to reflect current industry realities.

**AI-Powered Career Recommendation Approaches:** Kettunen and Sampson [2] found that AI tools in this space tended to be one-way — they gave output but did not learn from user interaction or improve recommendations based on feedback. Minakshi Roy and Kalpana Sharma [5] integrated Holland's RIASEC personality model with machine learning classifiers including Decision Trees, XGBoost, and Support Vector Machines, showing that the combination of psychological profiling with machine learning outperformed either approach used alone.

**Academic Guidance and Personalized Learning:** Rizal et al. [4] built a recommendation engine that used student GPA, declared interests, and self-reported skills to suggest academic courses and career paths. The system did not include any adaptive rescheduling for study activities. Shafkat Karim [6] reviewed AI-driven career platforms that incorporated Natural Language Processing for chatbot-style interactions and skill-gap analysis, finding that NLP-based platforms were better at engaging students but still struggled to give actionable, personalized guidance.

**Gaps the Current Work Addresses:** Nearly every

system reviewed handled either study planning or career guidance — none did both within a single platform. Career recommendations were frequently generic, relying on interest questionnaires without actually testing aptitude. Study planners used fixed schedules that could not adapt when students fell behind. None of the reviewed systems incorporated real-time awareness of industry trends when generating career suggestions. AcadNexus FutureAI is built to close these gaps by combining adaptive scheduling, aptitude testing, and industry-aware career recommendations into one platform.

**TABLE I**  
**Summary of Literature Survey**

| # | Authors                       | Year | Journal/Conference                                     | Key Contribution                                                                                          |
|---|-------------------------------|------|--------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| 1 | Supriyanto et al.             | 2019 | <i>J. Phys.: Conf. Ser.</i> 1402                       | Rule-based expert system using forward chaining to map student profiles to career categories.             |
| 2 | Kettunen & Sampson            | 2021 | <i>ERIC Journal</i> EJ1470674                          | Qualitative review of AI career tools; scenario-based design workshops with guidance staff.               |
| 3 | Awi Godwin Ijuptil et al.     | 2025 | <i>Bima Journal of Science &amp; Tech., Vol. 9(2B)</i> | Decision tree + Fuzzy Logic RBES on three-tier PHP/MySQL/TensorFlow architecture.                         |
| 4 | Rizal et al.                  | 2023 | <i>AI-Powered Academic Guidance System</i>             | ML recommendation engine using GPA, interests, and skills for course and career suggestions.              |
| 5 | Minakshi Roy & Kalpana Sharma | 2026 | <i>IEEE Access Journal</i>                             | Holland's RIASEC model combined with Decision Trees, XGBoost, and SVM for career pathway mapping.         |
| 6 | A.K.M. Shafkat Karim          | 2025 | <i>AI Platform Review (March 2025)</i>                 | NLP/ML career platforms with chatbot interfaces and skill-gap analysis for personalized path suggestions. |

### III. SYSTEM ARCHITECTURE

The architecture of AcadNexus FutureAI is divided into four major layers: the Presentation Layer, Application Layer, Data and AI Layer, and Infrastructure Layer. This layered structure helps the system remain organized, scalable, and easier to maintain.

#### Presentation Layer

The Presentation Layer is responsible for the user interface and overall user experience. It was developed using React 18 as a single-page application framework, while Vite was used for faster development and optimized production performance.

To maintain a clean and responsive design across different devices and screen sizes, Tailwind CSS was used for styling the interface. User authentication is managed through Google OAuth 2.0, allowing secure login functionality. JSON Web Tokens (JWT) are decoded on the client side to retrieve user identity information for personalized features.

This layer includes several important interfaces, such as:

- A main dashboard displaying study progress and productivity trends
- A schedule management module for timetable creation and updates
- A career guidance section
- An aptitude assessment interface
- A notifications center for reminders and updates

Together, these components create an interactive and user-friendly environment for students.

#### Application Layer

The Application Layer handles the main business logic of the platform. It is built using Node.js and Express.js, which expose the system functionality through a RESTful API. For AI-related computations and more intensive processing tasks, an optional Python FastAPI module can also be integrated.

This layer contains the core modules of the platform, including:

- The **Schedule Engine**, which generates personalized study timetables
- The **Adaptive Planner**, which automatically adjusts schedules when tasks are missed
- The **Aptitude Assessment Module**, responsible for conducting and evaluating student assessments
- The **Career Recommendation Engine**, which analyzes aptitude scores, user interests, and industry trends to suggest suitable career paths

The REST API acts as a communication bridge between the frontend interface and backend services, ensuring smooth data exchange across the platform.

#### Data and AI Layer

The Data and AI Layer is responsible for data storage, management, and intelligent processing. The system uses two different databases to handle different types of information efficiently.

MongoDB Atlas is used for storing flexible and dynamic data such as user profiles, study plans, progress tracking, and personalized activity records. Since this information can vary between users, a schema-less database provides greater flexibility.

PostgreSQL is used for storing structured and relational data where consistency and referential integrity are important. This includes assessment question banks, scoring rubrics, and structured evaluation records.

In addition, a machine learning model trained on historical student data is used to generate weighted difficulty scores and scheduling priorities. This helps the system create more realistic and personalized study plans for users.

A natural language processing component parses free-text interest descriptions entered during onboarding. An external API connection retrieves current industry hiring signals and skill-demand rankings to keep career recommendations aligned with the present job market rather than historical patterns.

The Infrastructure Layer underpins the entire stack. The React frontend is deployed on Vercel or Netlify, both of which offer serverless edge delivery that minimizes latency for geographically distributed users. The Node.js backend runs on a cloud server with one virtual CPU and between 512 MB and 1 GB of RAM – a deliberately lean specification chosen to validate that the platform's core functionality does not require heavy compute resources. Version control is managed through Git and GitHub, with continuous integration checks that run automatically on each pull request. Twilio and SendGrid handle outbound notifications, delivering study reminders and deadline alerts through SMS and email channels respectively.

### IV. SYSTEM REQUIREMENTS

**Hardware Requirements:** For development, the platform requires at minimum an Intel i3 or AMD Ryzen 3 processor with 4 GB of RAM, though 8 to 16 GB is recommended for running the full development environment comfortably. Storage of at least 10 GB is needed, with SSD storage preferred for build performance. A stable broadband internet connection is required for accessing cloud services and external APIs during development. For deployment, the frontend is hosted serverlessly on Vercel or Netlify. The backend runs on a server with at least 1 vCPU and 512 MB to 1 GB of RAM. The database layer uses MongoDB Atlas on the free tier.

**Software Requirements:** The operating system on the development machine can be Windows 10 or 11, macOS, or any current Linux distribution. Node.js version 18 or later is required for both the frontend build toolchain and the backend runtime. Python version 3.10 or later is used optionally for FastAPI or Flask components. The frontend is built with React 18 as a Single Page Application, using Vite as the build tool. Tailwind CSS handles styling. Authentication uses Google OAuth via the @react-oauth/google library, with JWT tokens decoded on the client side. The backend API layer runs on Node.js with Express.js. The primary database is MongoDB for flexible document-based storage, with PostgreSQL used where structured relational data is

needed. Email and SMS notifications are handled through Twilio or SendGrid integrations.

## V. METHODOLOGY

The platform follows a well-structured nine-step workflow that guides students from the moment they log in to the point where they receive personalized academic planning and career recommendations. The overall goal of the system is to reduce confusion, improve study consistency, and help students make informed career decisions based on both their interests and abilities.

### User Authentication

The first step in the platform is secure user authentication using Google OAuth 2.0. Instead of creating separate usernames and passwords, students can simply sign in using their Google accounts. Once the login is successful, the system securely decodes the JWT token to retrieve essential details such as the student's name, email address, and profile picture.

This method provides a smooth and hassle-free login experience while also maintaining strong security standards. By avoiding manual password management, the platform becomes easier and faster for students to access regularly.

### Profile Data Collection

After logging in, students are asked to provide details related to their academics and study habits. This includes the subjects they are currently studying, upcoming examination dates, the number of hours they can dedicate daily for preparation, and any specific academic or career goals they wish to achieve.

This information acts as the foundation for personalization within the system. By understanding each student's workload, available time, and priorities, the platform can generate schedules and recommendations that are realistic and tailored to individual needs rather than using a generic approach.

### Data Analysis and Processing

Once the information is collected, the system processes the data to understand the student's academic situation more clearly. It analyzes factors such as subject difficulty, time remaining before exams, study availability, and subject importance.

The processed data is then converted into a structured format that can be used efficiently by the scheduling and recommendation modules. This step ensures that all future outputs generated by the system are based on logical analysis rather than random distribution.

### Smart Schedule Generation

Using the analyzed data, the platform creates an intelligent daily study timetable. The scheduling algorithm distributes study sessions across available days in a balanced manner. Subjects that are more difficult or have exams approaching soon are automatically given

higher priority and additional study time.

The system also ensures that the generated timetable remains practical and achievable. Instead of overloading students with unrealistic tasks, it spreads the workload evenly so that students can maintain consistency and avoid burnout.

### Progress Monitoring and Adaptive Rescheduling

As students follow the timetable, they can mark tasks as completed or skipped. The system continuously monitors this progress and updates the schedule accordingly.

If a student misses a planned session, the platform intelligently redistributes the unfinished work into future time slots without creating excessive pressure on a single day. This adaptive rescheduling feature helps students recover from disruptions while still staying on track with their preparation.

### Aptitude Assessment Module

The platform also includes an aptitude assessment module designed to evaluate a student's logical reasoning, analytical thinking, and problem-solving skills. Students answer a set of structured questions, and the system analyzes their performance to identify their strengths and capabilities.

Unlike systems that rely only on self-reported interests, this module provides objective insights into the student's actual abilities. These results play an important role in generating more accurate and meaningful career recommendations.

### Career Recommendation Engine

The career recommendation engine combines multiple sources of information to suggest suitable career paths. It considers the student's aptitude test performance, personal interests, and current industry demands in fields such as technology and related domains.

Based on this combined analysis, the system recommends careers that align not only with what the student likes, but also with what they are naturally skilled at and what the job market currently requires. This helps students make more practical and informed career decisions.

### Continuous Feedback and Improvement

The platform is designed to improve continuously over time rather than providing a one-time solution. As students continue using the system, their study behavior, schedule completion rates, and reassessment performances are collected and analyzed.

This feedback is used to refine both the scheduling algorithm and the career recommendation engine. As a result, the platform becomes increasingly personalized and accurate, adapting to each student's habits, strengths, and progress over time.

## VI. RESULTS AND DISCUSSIONS

The first version of AcadNexus FutureAI performed incredibly well during early testing, proving that the platform actually does what it was built to do. To see how it would handle real-life scenarios, the system was tested using a variety of different student profiles, each with a unique mix of classes, different free-time schedules, and various test dates. The scheduling system handled this beautifully, successfully building balanced study plans by automatically giving extra time to harder subjects and upcoming test deadlines. This proved that the app's inner logic is smart enough to create realistic schedules for everyday student life.

One of the most impressive features during testing was how the app handled missed study sessions. If a student skipped a planned study block, the system didn't just pile all that extra work onto the next day. Instead, it took the missed tasks and spread them out gently over future free spots. Even better, it made sure never to push past the maximum daily study limit set by the student. This kept the daily workload comfortable and stopped students from feeling overwhelmed by a mountain of catch-up work the next morning.

The career side of the app also got great feedback during the trial. Students who took the built-in quizzes felt the career suggestions were much more personal and accurate than the standard tests they usually find online. This happened because the platform doesn't just ask students what they are interested in; it actually looks at their real problem-solving skills and logic abilities. Plus, the system checks live job market data to make sure it only suggests careers where companies are actively hiring, pointing students toward practical future goals by mixing their actual strengths with current trends.

However, because the platform is still in its early stages, there are a few limitations that need to be worked out. The app has only been tested in small groups so far, so it needs to be opened up to a much larger crowd of real-world students to prove it is truly reliable on a big scale. Finally, while the skills tests work fine, the questions need to be refined by experts to make sure the results are completely fair, balanced, and accurate for all kinds of students. These minor drawbacks give the team a clear checklist of what to improve in the next update.

## VII. CONCLUSIONS

Every student eventually bumps into two massive roadblocks: trying to keep their grades up without burning out, and trying to figure out what they actually want to do with their life after graduation. Right now, managing schoolwork and planning a career feel like two completely separate, stressful jobs. That is exactly why we built AcadNexus FutureAI. We wanted to take those two huge burdens and merge them into one simple, intelligent ecosystem that guides students through their classes today

while preparing them for the working world tomorrow.

Before building this, we spent a lot of time researching how modern technology—like machine learning recommendation systems and adaptive learning software—is being used in education. We realized that while there are plenty of apps out there, most of them feel like rigid, one-size-fits-all tools. They don't understand that every student learns differently, and they usually rely on old, out-dated lists of jobs. AcadNexus FutureAI was created to fix those flaws. We wanted to build something that actually feels personalized, stays flexible, and understands what is happening in the real world right now.

To make this happen, we focused heavily on creating a study planner that actually works like a human brain. Most digital calendars break the moment you miss a single assignment, leaving you feeling defeated. Our system is dynamic: it looks at how difficult a subject is, how many hours you actually have available, and when your exams are to build a realistic schedule. If you get sick, have a busy week, or just fall behind, the platform doesn't punish you. It automatically recalibrates your schedule in real time, shifting tasks around so your goals stay achievable and you never feel overwhelmed.

At the exact same time, the platform is looking out for your future. It uses smart aptitude tests to look at how you solve problems and think through challenges, matching your natural strengths with potential careers. But we didn't want to just recommend the same old traditional jobs. Our recommendation engine hooks directly into live industry data. This means the platform is constantly watching the actual job market, tracking which fields are growing and what skills companies are actively looking for. Instead of pointing you toward a career path that was popular ten years ago, it guides you toward real-world opportunities that exist right now.

Right now, we have successfully finished the foundational blueprint, the system architecture, and the logic that makes the platform run. We are currently working on the next big phase of development, which includes launching the complete backend system and using advanced AI to generate clear, conversational descriptions for different career paths. We are also building smarter aptitude tests that automatically adjust their difficulty based on your answers, as well as an in-depth productivity dashboard. This dashboard will let students track their study habits and see exactly how they are progressing across the entire semester. Ultimately, AcadNexus FutureAI is designed to replace student anxiety with confidence, helping you stay organized, boost your grades, and step into your future career with total peace of mind.

Overall, AcadNexus FutureAI aims to create a smarter and more supportive learning ecosystem where students

can improve their academic performance, stay organized, and make informed career decisions with greater confidence.

## ACKNOWLEDGEMENT

We would like to express our sincere gratitude to the Department of Computer Science and Engineering at Malnad College of Engineering. We are incredibly thankful for the valuable resources, steady guidance, and supportive environment they provided, all of which played a massive role in helping us successfully complete this work. The encouragement and facilities offered by the department played an important role in the development and completion of this project.

## REFERENCES

- [1] Supriyanto et al., "Application of Expert System for Career Guidance for Students," Journal of Physics: Conference Series, vol. 1402, 066031, 2019.
- [2] J. Kettunen and J. P. Sampson, "Artificial Intelligence for Career Guidance – Current Requirements and Prospects for the Future," ERIC Journal, EJ1470674, 2021.
- [3] A. G. Ijupatil et al., "Developing a Career Guidance Expert System for Selection of University Programme by Secondary School Students," Bima Journal of Science and Technology, vol. 9, no. 2B, 2025.
- [4] Rizal et al., "AI-Powered Academic Guidance and Counselling System Based on Student Profile and Interests," 2023.
- [5] M. Roy and K. Sharma, "AI-Powered Career Guidance: A Scalable Model for Personalized Recommendations," IEEE Access Journal, 2026.
- [6] A. K. M. S. Karim, "Transforming Career Guidance with AI Technology," AI Platform Review, March 2025