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Research Paper

NEXTGEN CAREERS: AI-DRIVEN RESUME BUILDER AND CAREER PATH ADVISOR

Dr. M. G. Vara Prasad ¹, N. Sri Charishma ², R. Vijay ³, P. Yashwanth Kumar ⁴,
S. Venkata Anil Kumar Reddy ⁵

¹Assistant Professor, Department of CSE, NSRIT, Vishakhapatnam, India

^{2,3,4,5} Student of Department of CSE, NSRIT, Vishakhapatnam, India

Abstract

NextGen Careers is a cutting-edge, AI-based system designed from the ground up to transform student employability through a new paradigm of bridging the gap between theory and practice in a rapidly changing industry landscape. Unlike other tools, which are often designed to concentrate on visual formatting, NextGen Careers uses sophisticated semantic analysis to review and assess student resume content, ensuring alignment with recruiter expectations and Automated Tracking Systems (ATS). The underlying AI and machine learning models use a modular framework, incorporating a powerful FAISS-based vector index, allowing for rapid and efficient similarity searches on student data and complex job-role vectors, thereby allowing for accurate skill gap identification and alignment score calculations, ensuring a student is adequately prepared for a variety of different career paths. To address skill gaps, a sophisticated rules-based recommendation algorithm has also been incorporated, allowing for structured learning pathways, certification, and project ideas, effectively turning career preparation into a measurable and quantifiable exercise. To further improve the overall user experience, a conversational AI-based chatbot has also been integrated, allowing for real-time, interactive mentoring and complex career question and answer resolution, ensuring that each and every student has the tools and skills necessary to successfully navigate a rapidly changing global marketplace with confidence and accuracy. Experimental results confirm the effectiveness and superiority of this new paradigm, ensuring rapid response times, broader recommendation sets, and enhanced profile optimization, effectively turning intelligent resume auditing and proactive career analytics into a powerful new career preparation and advancement platform.

Keywords

Artificial Intelligence, Career Guidance System, Placement Preparation, Recommendation System, Resume Builder, Job Matching, Educational Technology, Data Analytics, Skill Development, MCQ Practice System.

1. Introduction

In today's highly competitive job market, students face increasing challenges in identifying suitable career paths and preparing industry-ready resumes. Rapid technological advancements have created new job roles that require specialized and evolving skill sets. However, many

students lack structured guidance and clarity regarding required competencies. Traditional resume-building platforms primarily offer templates without intelligent feedback mechanisms. As a result, resumes often fail to meet Applicant Tracking System (ATS) standards and do not effectively align with job descriptions. Furthermore, students may be unaware of skill gaps that prevent them from qualifying for targeted roles. Personalized career counselling services are limited and not always scalable. To address these issues, NextGen Careers introduces an AI-driven framework that integrates resume parsing, semantic similarity matching, and recommendation modelling. The system evaluates user profiles against dynamic job-market data and computes alignment scores. It identifies missing skills and suggests curated learning resources and projects. By leveraging embedding-based comparison instead of keyword matching, the system improves recommendation accuracy. The platform also includes an AI chatbot mentor for interactive career guidance. Gamified tracking mechanisms encourage consistent progress and skill development. The system also includes a placement preparation module where students can explore IT, Non-IT, and Core company hiring patterns along with aptitude and coding practice questions. This helps students understand recruitment processes and improve their readiness for campus placements. The objective is to create a comprehensive digital ecosystem that supports students from resume creation to career readiness. Through automation and intelligent analytics, the system reduces uncertainty and enhances employability outcomes.

2. Contributions of the Work

This work makes the following contributions:

1. Proposes a unified platform that combines career guidance and placement preparation in a single system.
2. Develops a resume builder that helps students create structured and professional resumes.
3. Implements a recommendation system that suggests courses and career paths based on user inputs.
4. Provides a placement preparation module with company-specific information and MCQ-based practice.
5. Introduces an AI-based advisor to assist students with career-related queries.
6. Includes a feedback mechanism to improve system performance and user experience.
7. Designs a modular architecture that allows easy expansion of features in the future.

3. Methodology

3.1. AI-Based Career Path Recommendation

The NextGen Careers platform initiates its workflow by collecting detailed input from users regarding their interests, skills, educational background, and career preferences. This data is

processed using intelligent recommendation techniques that map user attributes with predefined career domains. The system evaluates similarities between user profiles and domain requirements to generate accurate and personalized career suggestions. By leveraging this approach, the platform minimizes ambiguity in career selection and helps users identify fields that align with both their interests and skill sets. This not only improves decision-making but also ensures that users follow a career path that is sustainable and growth-oriented. Additionally, the system can refine its recommendations over time as more user data is collected, thereby improving accuracy and relevance.

3.2. Course Recommendation and Learning Path

Once a suitable career path is identified, the platform recommends a set of relevant courses that are essential for skill development in that domain. These courses are organized into a structured learning path, ensuring a logical progression from basic concepts to advanced topics. The system allows users to enroll in courses and tracks their progress continuously through completion metrics and performance indicators. This structured approach helps users maintain consistency in learning and prevents them from feeling overwhelmed by unorganized content. Furthermore, the platform encourages self-paced learning, enabling users to progress according to their individual speed and understanding. By aligning course recommendations with career goals, the system ensures that users acquire industry-relevant skills in an efficient and systematic manner.

3.3. AI Advisor

To provide continuous guidance, the platform integrates an AI-based advisor that acts as a domain-specific chatbot. This advisor interacts with users by understanding their queries and providing relevant suggestions based on their selected area of interest. Unlike general-purpose chatbots, this system restricts its responses to the user's chosen domain, ensuring focused and meaningful interactions. It assists users in identifying required skills, recommending additional learning resources, and clarifying doubts related to career progression. The AI advisor also adapts to user behavior and preferences over time, thereby enhancing the personalization of responses. This feature significantly improves user engagement and acts as a virtual mentor, guiding users throughout their learning and career development journey.

3.4. Resume Builder with ATS Optimization

The resume builder module is designed to help users create professional resumes that meet industry standards and are compatible with Applicant Tracking Systems (ATS). The system provides predefined templates with structured sections such as personal details, education, skills, projects, and certifications. Users can input their information in an organized manner, ensuring clarity and completeness. The platform emphasizes keyword optimization and proper formatting, which are essential for passing ATS screening processes. Additionally, users can customize their resumes based on job requirements and download them in suitable formats for submission. This feature simplifies the resume creation process and enhances the chances of shortlisting in recruitment procedures.

3.5. Job Recommendation System

The job recommendation system plays a crucial role in connecting users with relevant employment opportunities. It analyzes user profiles, including their skills, completed courses,

certifications, and selected career paths, and compares them with job requirements. Based on this comparison, the system generates a list of suitable job roles that match the user's qualifications. This targeted approach reduces the effort required to search for jobs and increases the likelihood of finding appropriate opportunities. Furthermore, the system can be updated regularly to reflect current market trends, ensuring that users receive up-to-date job recommendations. By aligning job suggestions with user capabilities, the platform enhances employability and career success.

3.6. Certification Management System

The certification management system allows users to upload, organize, and maintain a record of their academic and professional achievements. This centralized storage ensures that users can easily access their certifications whenever required. The system also supports integration with the resume builder, enabling users to include their certifications seamlessly in their resumes. This feature not only enhances the credibility of user profiles but also simplifies documentation during job applications. By maintaining a structured record of achievements, the platform helps users showcase their qualifications effectively to potential employers.

3.7. Placement Preparation Module

In addition to career guidance and learning, the platform includes a dedicated placement preparation module to help users succeed in recruitment processes. This module provides a wide range of multiple-choice questions covering aptitude, logical reasoning, and technical topics. Each question is accompanied by a detailed explanation, enabling users to understand the underlying concepts and improve their problem-solving skills. The system encourages regular practice and helps users assess their performance through continuous evaluation. By combining theoretical knowledge with practical problem-solving, this module ensures comprehensive preparation for competitive exams and interviews.

3.8. Feedback System

The feedback system is an essential component that enables users to share their experiences and opinions about the platform. After using different modules, users can provide ratings and detailed comments, highlighting both strengths and areas for improvement. This feedback is collected and analyzed to identify patterns and user preferences. By incorporating user suggestions, the platform can continuously evolve and enhance its features. This user-centric approach ensures that the system remains relevant, effective, and aligned with user expectations.

3.9. Admin Dashboard and Analytics

The platform includes a secure admin dashboard that provides detailed insights into system usage and user behavior. Administrators can monitor the number of active users, analyze course enrollment trends, and evaluate overall engagement levels. The dashboard presents data in a clear and organized manner, enabling easy interpretation and decision-making. By analyzing this data, administrators can identify popular features, improve less-used modules, and optimize the overall performance of the platform. This data-driven approach ensures efficient management and continuous improvement of the system.

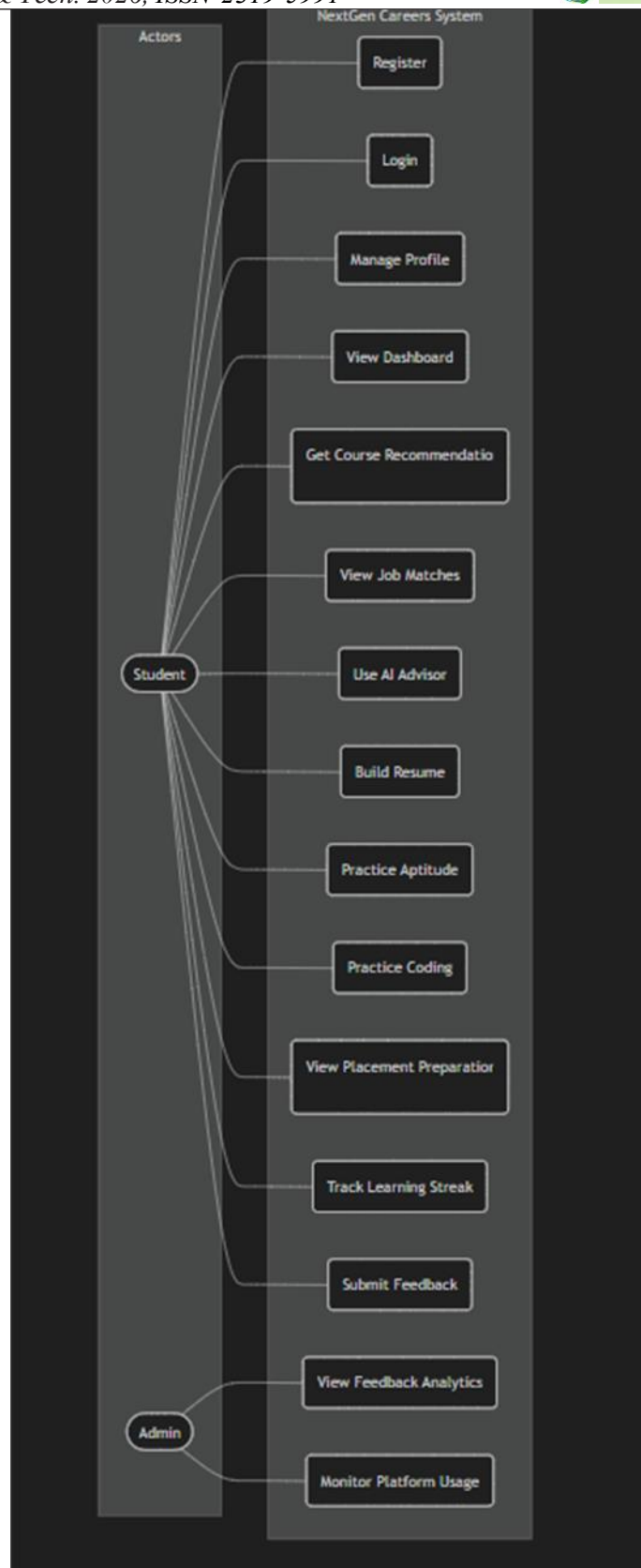


Fig.3.1. Flow Chart of NextGen Careers System

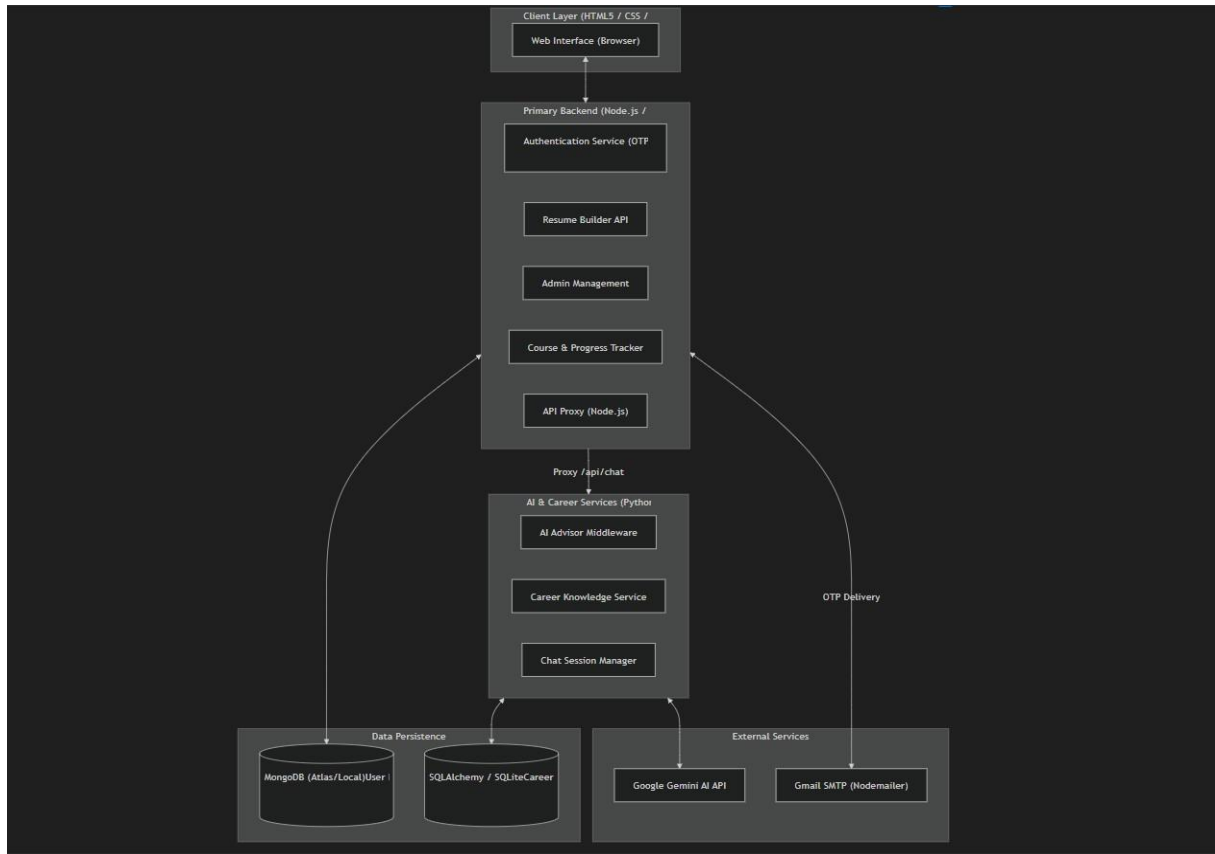


Fig.3.2. System Architecture of NextGen Careers

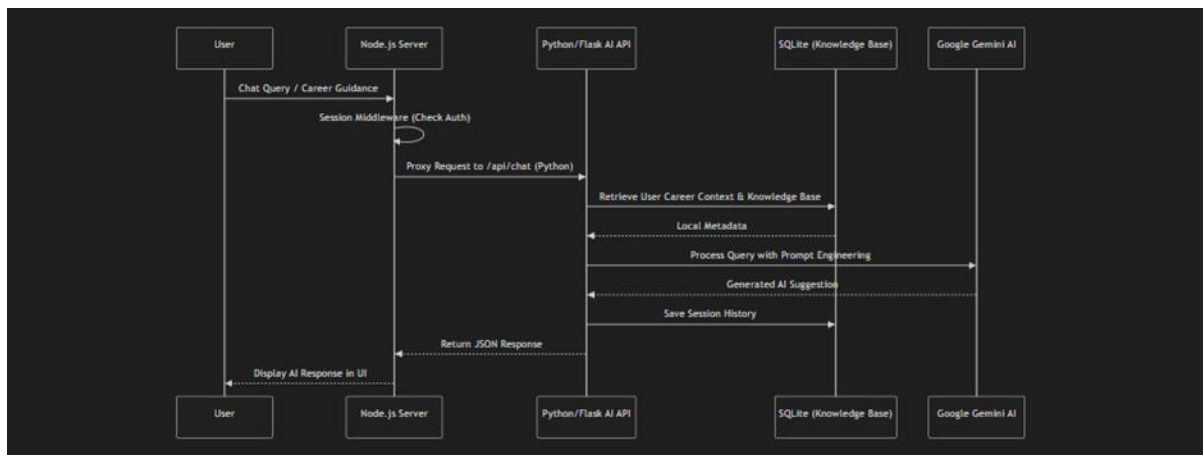


Fig.3.3. Flow Chart of AI Advisor

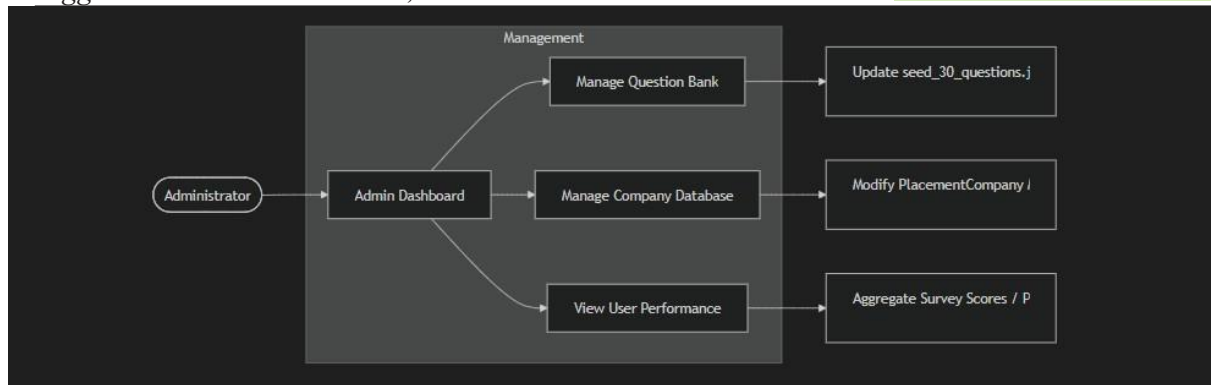


Fig.3.4. Flow Chart for Placement Preparation

4. Abbreviations

- AI** – Artificial Intelligence
- ATS** – Applicant Tracking System
- UI** – User Interface
- DB** – Database
- API** – Application Programming Interface

5. Summary of Algorithms and Formulas:

5.1. Recommendation Algorithm (Content-Based Filtering): The platform uses a content-based filtering algorithm to recommend career paths and courses by comparing user interests and skills with available options. A similarity score is calculated based on matching features, ensuring personalized and relevant suggestions.

5.2. Job Matching Algorithm: The job matching algorithm compares user skills and qualifications with job requirements to generate a match score. This score, usually expressed as a percentage, helps in recommending jobs that best fit the user's profile.

5.3. Learning Progress Tracking Algorithm: The system tracks user progress by calculating the percentage of completed modules in a course. This helps users monitor their learning and stay consistent.

5.4. AI Advisor Logic (Rule-Based and Context Filtering): The AI advisor uses rule-based logic and filters responses based on the user's selected domain. This ensures that all suggestions and guidance remain relevant to the user's interests.

5.5. Resume Scoring Algorithm (ATS Optimization): The resume scoring algorithm evaluates resumes based on keywords, structure, and completeness to ensure ATS compatibility. This improves the chances of selection during recruitment.

5.6. Feedback Analysis Algorithm: User feedback is analyzed by calculating average ratings and reviewing comments. This helps in identifying areas for improvement in the platform.

5.7. Admin Analytics Algorithm: The system analyzes user activity and course enrollments to determine trends. Metrics like course popularity help administrators improve platform performance.

6. Preventions and Solutions:

6.1. Applicative Solutions: Enhancing Career Guidance and Platform Effectiveness

The NextGen Careers platform incorporates multiple solutions to address challenges related to career confusion, lack of guidance, and inefficient preparation methods. The system applies a combination of intelligent algorithms, structured learning, and user-centered design to provide effective solutions.

6.1.1. Personalized Recommendation System:

The platform reduces the problem of unclear career direction by providing personalized recommendations based on user interests and skills. By analyzing user input, the system suggests suitable career paths and courses, ensuring that users receive relevant and meaningful guidance. This minimizes confusion and helps users focus on well-defined goals.

6.1.2. Structured Learning Approach:

To overcome unorganized learning, the platform introduces a structured learning path where courses are arranged in a logical sequence. This allows users to build their knowledge step by step, starting from basic concepts and progressing to advanced topics, thereby improving learning efficiency and retention.

6.1.3. AI-Based Career Advisor:

The AI advisor acts as a focused guidance system that responds only within the user's selected domain. This prevents information overload and ensures that users receive accurate suggestions, skill recommendations, and career-related insights that are directly relevant to their interests.

6.1.4. ATS-Friendly Resume Builder:

Many candidates face rejection due to poorly structured resumes. The platform addresses this by providing ATS-friendly resume templates that ensure proper formatting, keyword optimization, and completeness. This increases the chances of passing automated screening systems used by recruiters.

6.1.5. Progress Monitoring and Analytics:

The system tracks user performance and learning progress, enabling users to identify weak areas and improve continuously.

6.1.6. Feedback-Driven Improvement:

The feedback module allows users to share their experiences, helping developers enhance platform features and usability.

6.2. Platform Optimization Techniques

6.2.1. Database Optimization:

Efficient database management techniques are implemented to handle large volumes of user data, course information, and analytics. This ensures fast data retrieval and smooth system performance even with increasing users.

6.2.2. Secure Authentication System:

The platform incorporates a secure server-side login system to protect sensitive user and admin data. This prevents unauthorized access and ensures that only authorized personnel can manage administrative functions.

6.2.3. Scalable Backend Architecture:

The backend is designed using scalable technologies that allow the system to handle multiple users simultaneously. This ensures that the platform remains stable and responsive even during high usage.

6.2.4. Responsive User Interface:

A responsive design is implemented to ensure accessibility across different devices such as desktops, tablets, and mobile phones. This enhances usability and provides a consistent experience for all users.

6.3. User-Centric Solutions for Better Engagement

6.3.1. Interactive Learning and Practice:

The platform includes MCQ-based practice with detailed explanations, which helps users understand concepts more effectively. This interactive approach improves problem-solving skills and prepares users for real-world assessments.

6.3.2. Progress Tracking System:

Users can monitor their learning progress through completion percentages and performance insights. This motivates them to stay consistent and achieve their learning goals.

6.3.3. Certification Management:

The certification module allows users to upload and manage their achievements in a single place. This helps in maintaining a professional profile and simplifies the process of showcasing qualifications.

6.3.4. Feedback Mechanism:

The feedback system enables users to provide ratings and comments on different modules. This helps developers understand user needs and continuously improve the platform based on real user experiences.

6.4 Admin-Level Solutions and Data Management

6.4.1. User Analytics Dashboard:

The admin dashboard provides a clear overview of user activity, including the number of registered users and their engagement levels. This helps in monitoring platform growth and performance.

6.4.2. Course Trend Analysis:

Administrators can analyze which courses are most frequently selected by users. This information helps in updating and improving course offerings based on demand.

6.4.3. Data-Driven Decision Making:

By analyzing collected data, administrators can make informed decisions to enhance platform features, optimize performance, and improve user satisfaction.

6.5 Future Enhancements

6.5.1. Advanced AI Integration:

Future improvements may include advanced machine learning models to provide more accurate and dynamic recommendations based on user behavior and trends.

6.5.2. Real-Time Job Integration

Integrating real-time job data from external platforms can provide users with updated and relevant job opportunities.

6.5.3. Mobile Application Development

Developing a mobile application will increase accessibility and allow users to learn and manage their profiles on the go.

6.5.4. Gamification Features

Introducing gamification elements such as badges, rewards, and leaderboards can increase user engagement and motivation.

6.6 Results

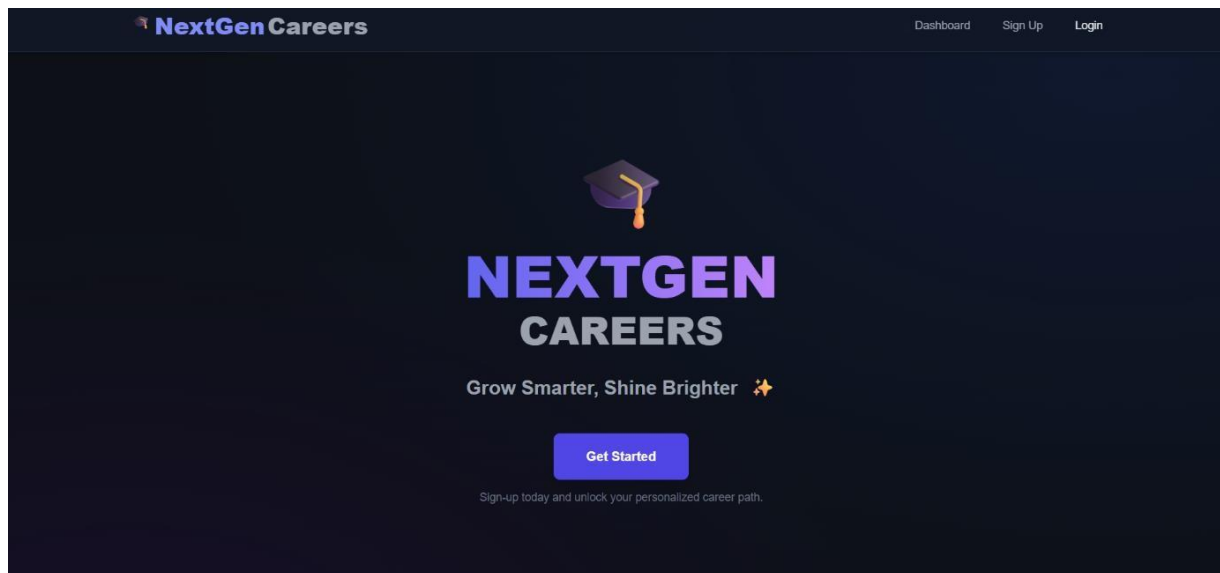


Fig.6.6.1. NextGen Careers Index Page

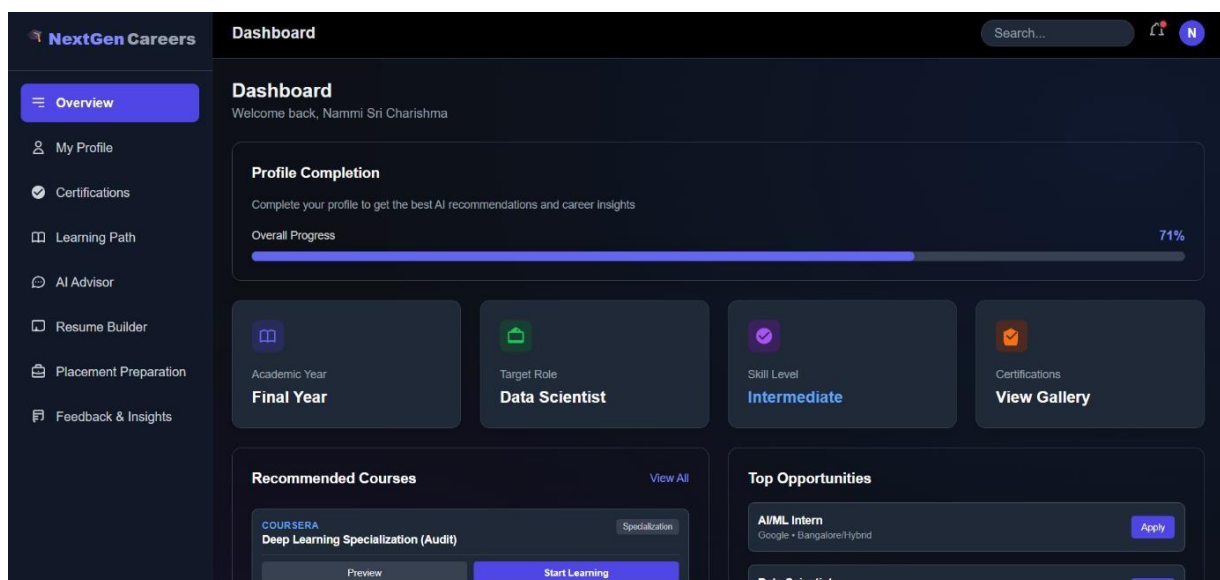


Fig.6.6.2. Dashboard Page

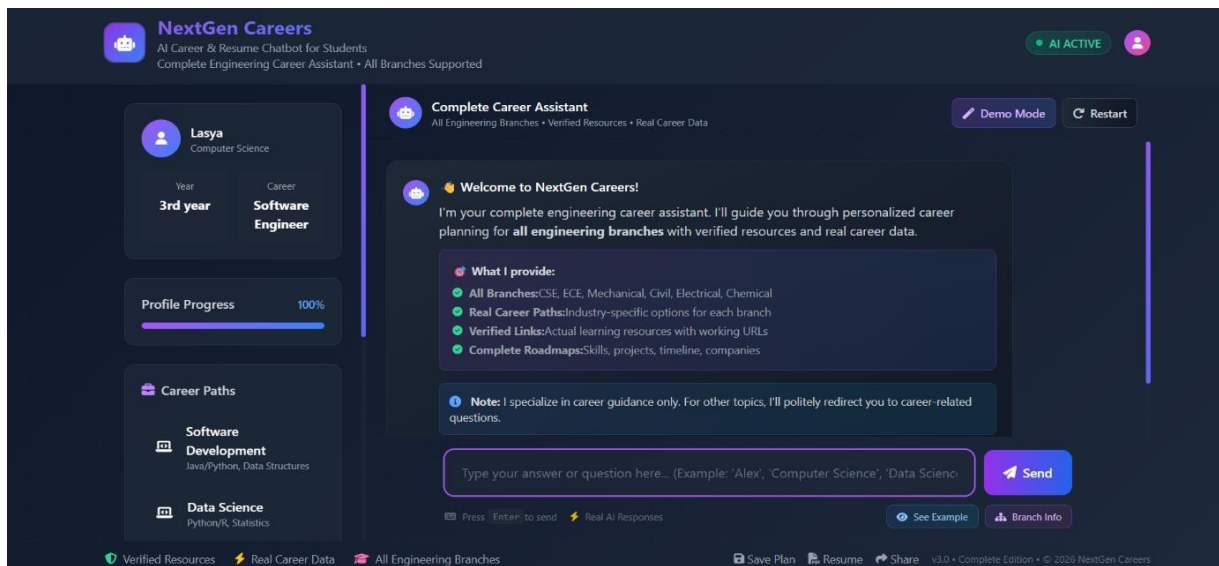


Fig.6.6.3. AI Advisor

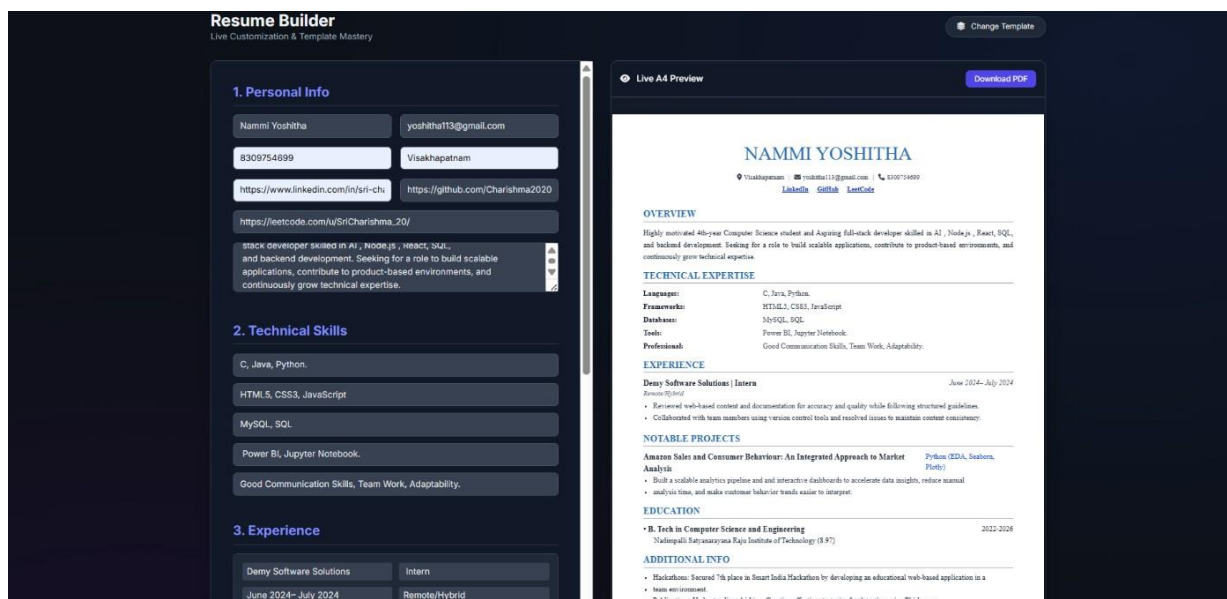


Fig.6.6.4. Resume Builder

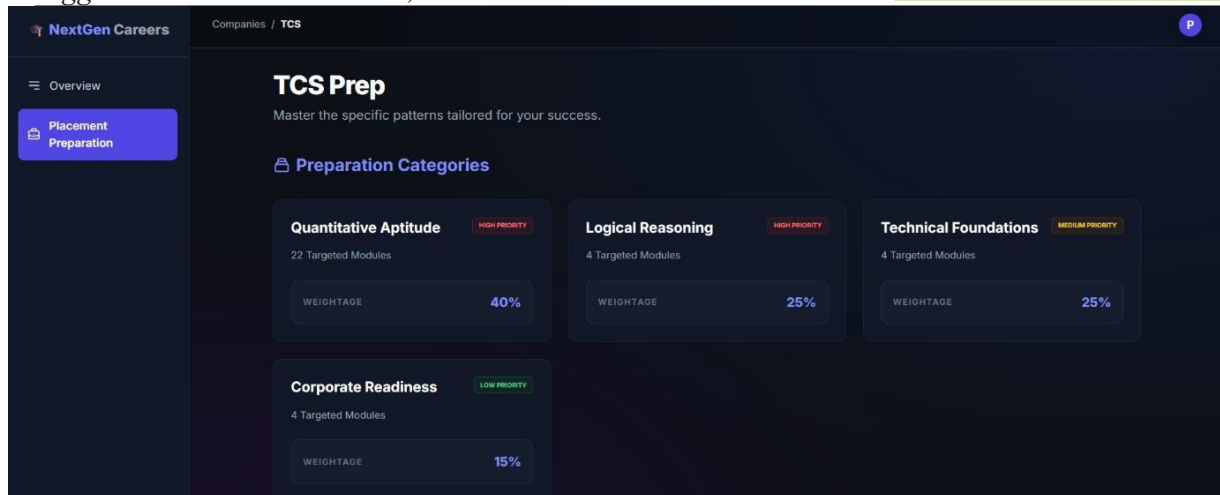


Fig.6.6.5. Placement Preparation Modules

7. Conclusion

The **NextGen Careers** platform provides a comprehensive and integrated approach to career development by combining artificial intelligence, structured learning, and professional tools within a single system. It effectively addresses the challenges faced by students and job seekers in choosing the right career path, building industry-ready skills, and preparing for job opportunities. By analyzing user interests and skills, the platform offers personalized career recommendations, relevant course suggestions, and job matching, ensuring that users receive meaningful and targeted guidance. The inclusion of an AI-based advisor enhances user experience by delivering domain-specific support, while the structured learning paths and progress tracking features promote continuous skill development. Additionally, the ATS-friendly resume builder improves employability by helping users create professional resumes that meet industry standards. The feedback system and admin analytics further contribute to the platform's improvement by enabling data-driven decision-making. Overall, the system simplifies the career planning process and empowers users with the necessary tools to succeed in a competitive environment, with future enhancements expected to make it even more dynamic and effective.

8. Acknowledgment

We express our sincere gratitude to our respected faculty members and mentors for their continuous guidance, encouragement, and valuable suggestions throughout the development of this project, which played a crucial role in shaping our ideas and improving the quality of our work. We are also thankful to our institution for providing the necessary resources and support required to successfully complete this project. We extend our appreciation to all team members for their dedication, cooperation, and consistent efforts in designing and implementing the NextGen Careers platform, as their teamwork was essential in achieving the project objectives. Furthermore, we acknowledge the contribution of various research papers, online resources, and technical documentation that enhanced our understanding and helped in the successful execution of this project. Finally, we are grateful to all users and well-wishers who provided valuable feedback and suggestions, which contributed significantly to refining the platform and improving its overall effectiveness.

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