

Career Verse

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Abstract—Career Verse is an AI-driven career guidance application that leverages machine learning and natural language processing to support students and early-career professionals. The platform brings together four key modules: Smart AI Resume Builder, AI Career Analytics, Strategic Roadmap Generator, and Campus Hub. These components work jointly to help users create ATS-friendly resumes, understand their career fit, plan targeted upskilling, and stay informed about relevant campus opportunities. The system aims to offer a unified, data-driven environment for more informed and confident career decisions.

Index Terms—Artificial Intelligence, Machine Learning, Natural Language Processing, Smart AI Resume Builder, AI Career Analytics, Strategic Roadmap Generator, Campus Hub, Career Guidance.

I. INTRODUCTION

In today's competitive job market, students and early-career professionals struggle to build strong profiles, identify suitable roles, and keep up with fast-changing opportunities. Traditional support such as one-time counselling, generic aptitude tests, and static job portals rarely provides continuous, personalised guidance. As a result, many candidates submit resumes that fail applicant tracking systems, follow unplanned learning paths, and overlook valuable hackathons, workshops, and placement activities that could enhance their careers. Career Verse is proposed as an AI-driven career guidance platform that leverages machine learning and natural language processing to address these issues. The Smart AI Resume Builder converts user inputs into ATS-compatible resumes and evaluates existing profiles to surface strengths, missing skills, and alignment with target roles.

The AI Career Analytics module behaves like an interactive assistant, answering career and interview

queries while estimating domain suitability from a learner's skills and interests. The Strategic Roadmap Generator then creates time-bound learning plans that prioritise required competencies and recommend appropriate online resources.

Finally, the Campus Hub aggregates institutional events—including hackathons, quizzes, seminars, and recruitment drives—into personalised feeds for students and management views for administrators, creating a connected digital environment that supports continuous career development.

II. PROPOSED SYSTEM

A. System Overview

The proposed system is a web-based AI career guidance platform completely designed to support students comprehensively, integrating four key features in one place: Smart AI Resume Builder, AI Career Analytics, Strategic Roadmap Generator, and Campus Hub. The architecture consists of four main layers. The Frontend Layer provides an interactive user interface developed using Streamlit, ensuring a simple and responsive user experience for all student features. The Backend Layer handles all core operations such as resume processing logic, career analytics workflows, roadmap generation, and data management using Python with integrated ML/NLP models. The API Integration Layer connects the system with external services for job data, learning resources, and campus information feeds. Finally, the Database Layer utilizes MySQL for secure storage of user profiles, resumes, analytics results, roadmaps, and campus resources. The system ensures seamless communication between all layers, enabling real-time AI processing and smooth student interactions. This integrated architecture makes the platform scalable, allowing future expansion for additional career tools.

B. System Architecture

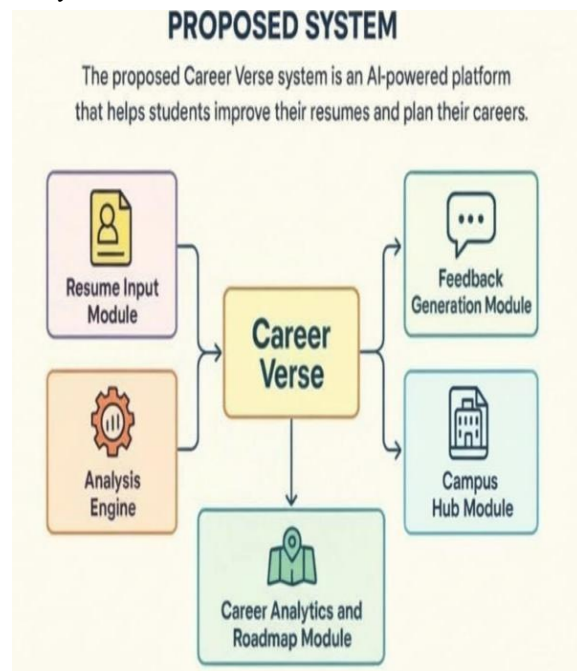


Fig: 1 The system architecture illustrates a Streamlit-based web app where students log in, enter their details, and access all Career Verse features through a single interface. User inputs are processed by Python-driven ML and NLP services in the backend to generate resume scores, career insights, and personalized roadmaps.

C. Modules of the System

The Career Verse platform consists of multiple integrated modules that collectively support intelligent career guidance. The User Authentication Module enables secure registration and login, ensuring that only authorized users access personalized features. After authentication, the Dashboard Navigation Module provides a centralized interface where users can easily explore all available functionalities. The AI Resume Builder and Analyzer Module allows users to upload or enter resume details, where NLP techniques evaluate resume quality, detect missing skills, and generate improvement suggestions. The AI Career Bot Module interacts with users to answer career-related queries and provides personalized recommendations such as suitable roles, required skills, and industry demands. The AI Roadmap Generator Module creates a tailored learning path aligned with the user's target career, proposing essential courses, certifications, and project ideas.

The Campus Hub Module keeps users updated with real-time job openings, internships, workshops, and hackathons. Finally, the Central Database Module securely stores user information, resume data, roadmaps, chatbot interactions, and applied opportunities for continuous career progress tracking.

D. Methodology

The proposed Career Verse system adopts a structured AI-driven methodology, as illustrated in Fig. 2. The workflow is organized into multiple sequential stages to ensure intelligent career guidance and a seamless user experience. In the initial User Authentication phase, users securely register or log in to access personalized services. Once authenticated, the Dashboard Interface provides an organized environment where users can navigate to various functional modules. The AI Resume Builder applies Natural Language Processing (NLP) techniques to evaluate resume content, detect missing competencies, analyze formatting standards, and generate improved resume versions. The AI Career Bot further interacts with users, assesses their career aspirations, analyzes their skill set against market requirements, and suggests appropriate career tracks. The Roadmap Generator then creates a customized learning roadmap aligned with the selected job role, highlighting essential courses, certifications, and practical project recommendations. The Campus Hub module aggregates and presents relevant career opportunities such as internships, workshops, placement drives, and hackathons to support immediate employability.

Additionally, a centralized database securely stores user information, resume analytics, chatbot interactions, and roadmap history for continuous progress monitoring. A dynamic feedback mechanism is incorporated to refine prediction accuracy and improve system responsiveness based on user validation. Continuous updates on industry trends ensure that recommendations stay current with evolving skill demands. Performance optimization techniques are applied throughout the pipeline to maintain efficient processing and reliable output. Thus, the methodology establishes a comprehensive, adaptive, and data-driven framework for AI-powered career development and decision-making.

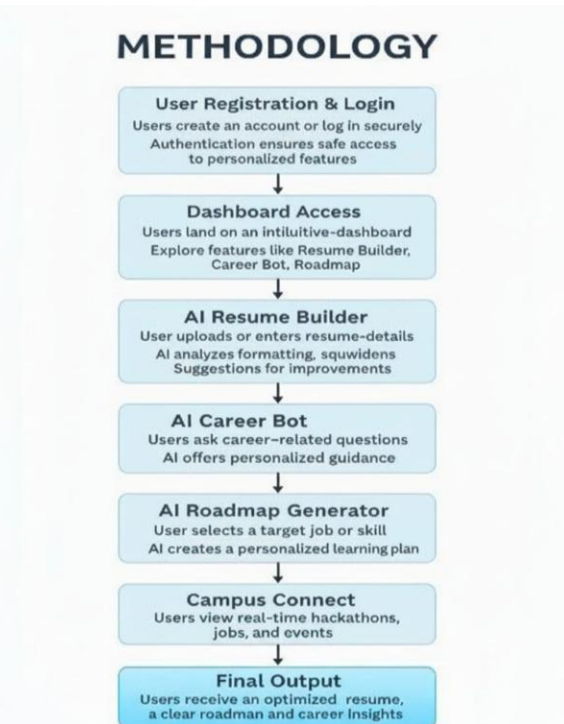


Fig 2: As shown in Fig. 2, the methodology progresses sequentially from user login to dashboard navigation, followed by AI-enabled resume evaluation, career analytics, roadmap generation, and real-time opportunity integration, ensuring a complete AI-powered career support pipeline.

III. RESULTS

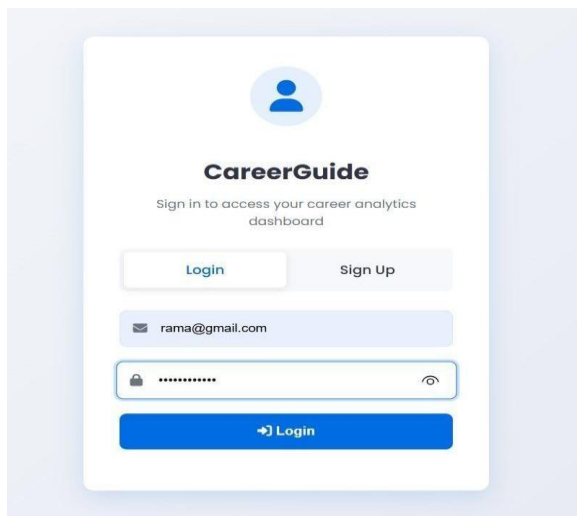


Fig 3: The figure displays the user login interface of the Career Verse platform. The page includes email & password input fields along with Login & Signup.

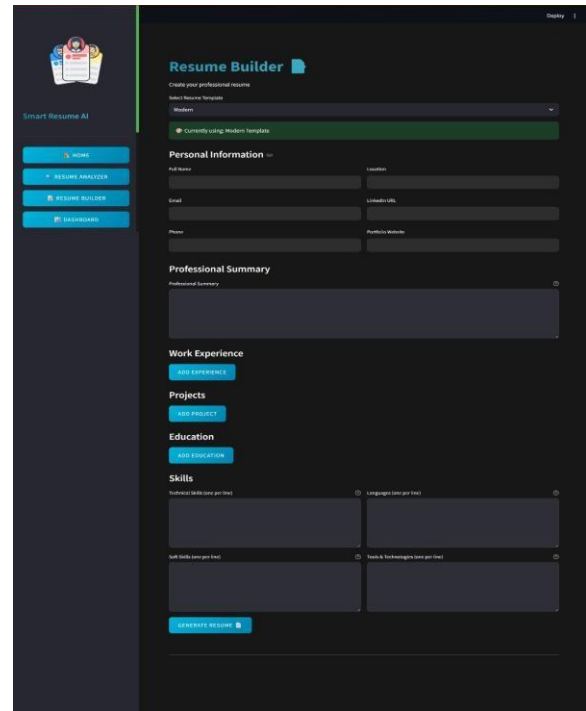


Fig 4: The figure shows the Resume Builder interface of the Career Verse platform, where users create professional resumes by selecting a template and entering key details such as personal information, summary, experience, projects, education, and skills.

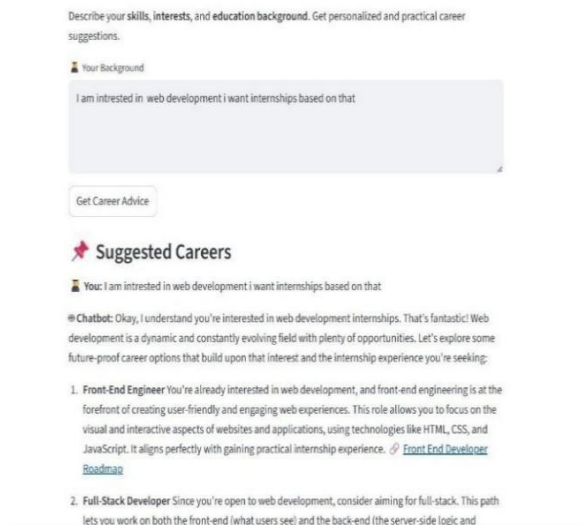
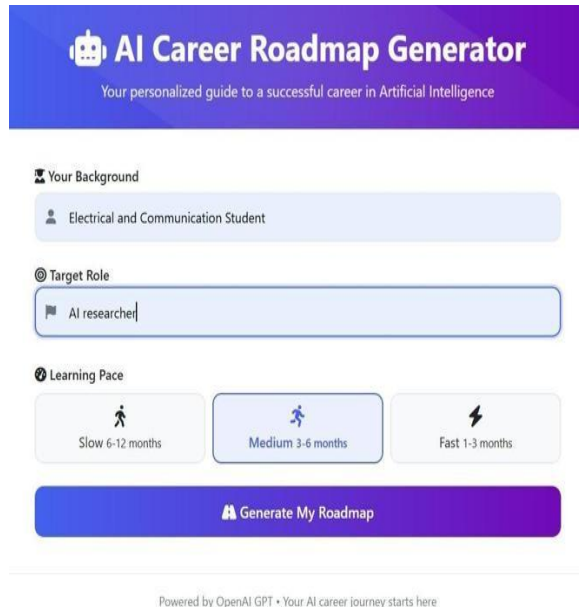


Fig 5: The figure illustrates the Career Analytics module of the Caree Verse platform, featuring an AI-powered career guidance chatbot. Users input their background, interests, and goals to receive personalized career suggestions.



AI Career Roadmap Generator
Your personalized guide to a successful career in Artificial Intelligence

Your Background
Electrical and Communication Student

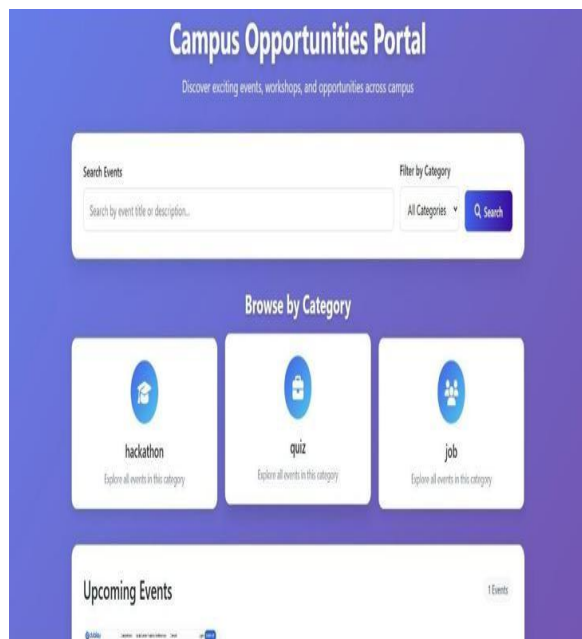
Target Role
AI researcher

Learning Pace
 Slow 6-12 months
 Medium 3-6 months
 Fast 1-3 months

Generate My Roadmap

Powered by OpenAI GPT • Your AI career journey starts here

Fig 6: The figure shows the Strategic Roadmap Generator of the Career Verse platform, which creates a personalized career roadmap based on the user's background, target role, and learning pace.



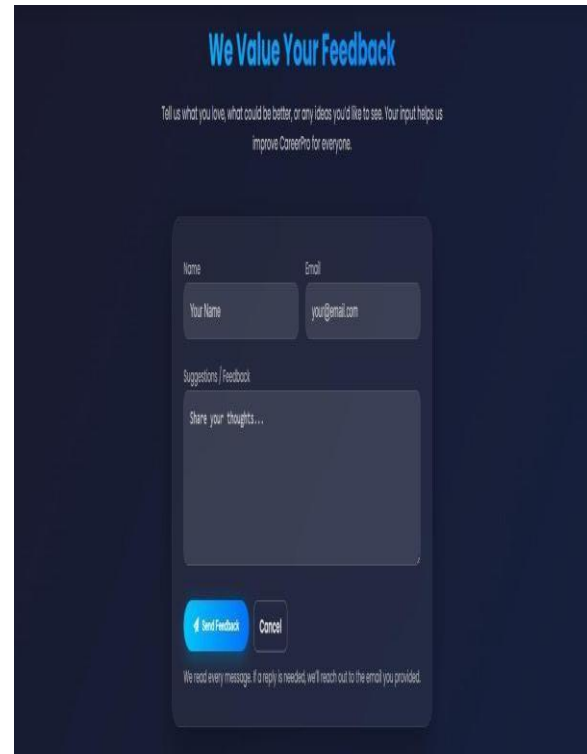
Campus Opportunities Portal
Discover exciting events, workshops, and opportunities across campus

Search Events
Search by event title or description...
Filter by Category: All Categories [Search]

Browse by Category
 hackathon
 quiz
 job

Upcoming Events
1 Events

Fig 7: The figure depicts the Campus Intelligence Hub interface of the Career Verse platform. This module serves as a centralized portal where users can explore campus-related opportunities such as hackathons, quizzes, and job openings



We Value Your Feedback
Tell us what you love, what could be better, or any ideas you'd like to see. Your input helps us improve CareerPro for everyone.

Name
Your Name

Email
your@email.com

Suggestions / Feedback
Share your thoughts...

Next Feedback **Cancel**

We read every message. If a reply is needed, we'll reach out to the email you provided.

Fig 8: The figure shows the Career Verse feedback interface, allowing users to submit their name, email, and suggestions to help improve the platform.

IV. CONCLUSION

Career Verse provides an intelligent all-in-one platform that bridges the gap between academic learning and professional readiness. It simplifies resume building through a Smart AI Resume Builder, analyses user skills via AI Career Analytics, generates structured learning paths with the Strategic Roadmap Generator, and keeps users informed about hackathons, quizzes, workshops, and placement events through the Campus Hub. By offering personalised AI-based support instead of one-time counselling and static portals, the system helps students and job seekers become truly career-ready, improving employability and confidence in today's competitive job market. The current implementation demonstrates that unifying resume intelligence, guided upskilling, and opportunity discovery in a single web application can significantly streamline the career-building process. Future enhancements can further extend this impact by adding AI-powered mock interviews with real-time feedback, integrating internship and job portals for direct applications, and introducing adaptive skill-assessment quizzes with

certification tracking. Developing a dedicated mobile app will provide seamless access from any location, while additional analytics for mentors and institutions can support better decision-making at the campus level. Together, these improvements position Career Verse as a scalable, data-driven ecosystem for continuous and holistic career development.

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