



UNIVATE

UNIVATE

Project Proposal

Project details for website design

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Problem Statement

Many Computer Science and Engineering (CSE) students struggle to choose the right stream that fits their interests and career goals. With options like Data Science, Cybersecurity, and Integrated Computer Engineering, it can be hard for students to know which path to take. They often lack clear guidance on which stream is best for them based on their strengths and career opportunities.

Additionally, students have limited access to tools that help them track their grades, plan their studies, and understand job market trends. This leads to students making poor stream choices and feeling unsatisfied with their academic journey. Educational institutions also face challenges in understanding student needs and planning resources effectively. There is a need for a platform that helps students make informed decisions about their streams, tracks their academic progress, and provides career advice to help them succeed.



Objectives

1

Provide Stream Selection Guidance:

Help students discover their strengths, interests, and align them with the most suitable CSE streams (Data Science, Cybersecurity, Integrated Computer Engineering, or General Stream).

2

Support Academic Planning:

Enable students to track their academic performance, calculate SGPA/CGPA automatically, and make data-driven decisions regarding their education.

3

Deliver Career Insights:

Equip students with detailed knowledge about career paths, job opportunities, and industry demands related to each stream.

4

Create an Interactive Learning Experience:

Engage students with tools like quizzes, data visualization, and dynamic content to simplify decision-making.

5

Streamline Information Access:

Digitalize the key content of the CSE handbook and present it in a user-friendly and visually appealing manner.

Proposed Solution

Develop a web application that serves as an interactive platform to assist CSE undergraduates in selecting their streams. Key features of the solution include:



Stream Selection Quiz:

A personalized quiz to evaluate students' interests and recommend the best-matching stream.

Academic Performance Tracker:

A user account system where students can input module grades for each semester, automatically calculate SGPA/CGPA, and display updated results on their profiles.

Stream Information Hub:

A comprehensive guide with detailed descriptions, core subjects, skills, and career opportunities for each stream.

Career Guidance Section:

Provide curated information on job roles, industry trends, and emerging opportunities related to each stream.

Dynamic and Engaging UI:

Incorporate visually appealing designs and interactive elements to create an enjoyable and seamless user experience.

Tech Stack

FRONTEND

1. React.js

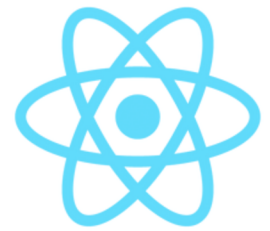
- For building an interactive and dynamic user interface.
- Provides component-based architecture, making the application modular and scalable.

2. CSS Framework

- **TailwindCSS**: For creating a modern, responsive, and visually appealing design.
- Offers utility-first styling for rapid development.

3. State Management

- **Redux (or Context API)**: To manage global states like user authentication and profile data efficiently.



BACKEND

1. Java Spring Boot

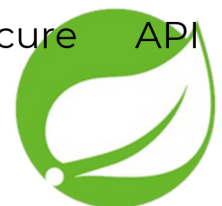
- For building a robust and scalable REST API.
- Handles business logic like CGPA/SGPA calculation, user authentication, and profile management.

2. Security

- **Spring Security**: For implementing secure login, user authentication, and role-based access control.

3. JSON Web Tokens (JWT)

- For user session management and secure API communication.



DATABASE

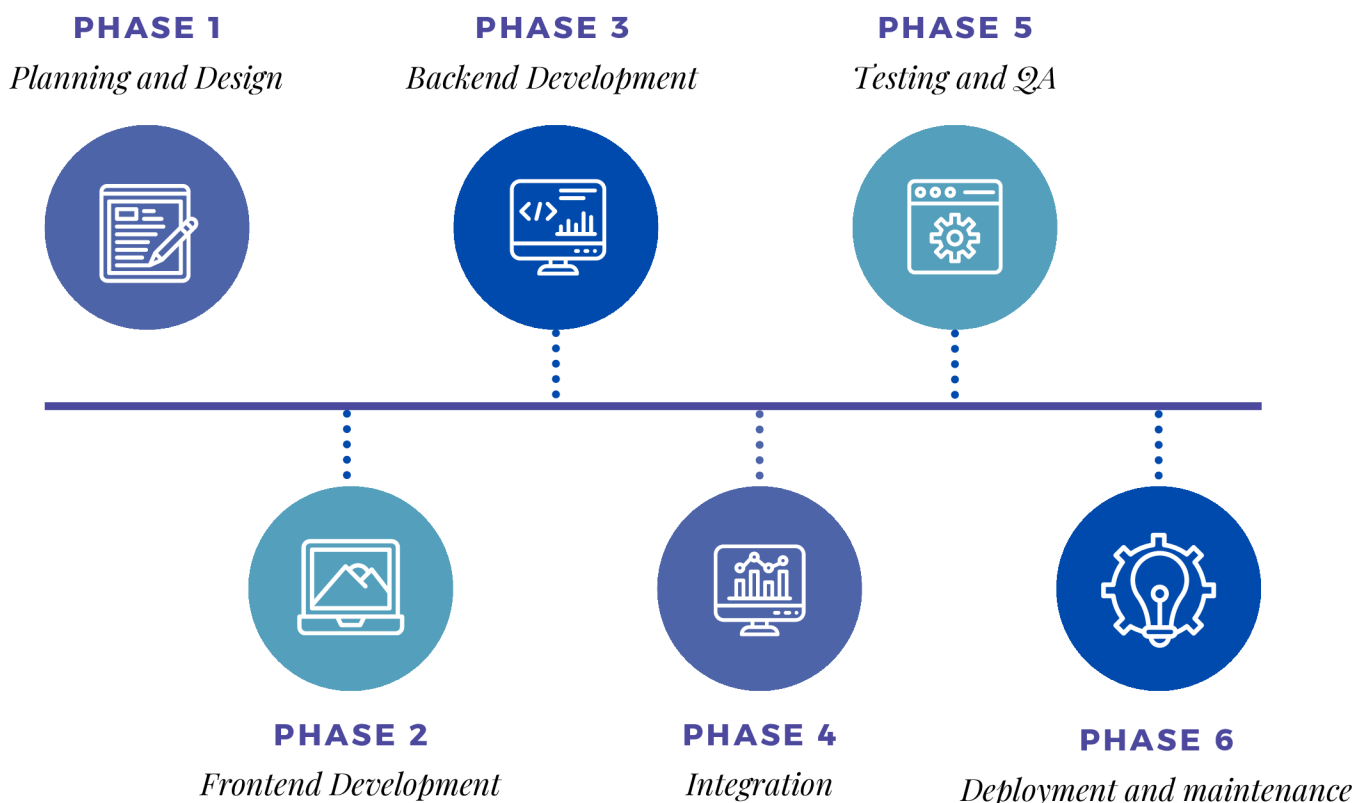
1. MySQL

1. Relational database to store structured data like user accounts, grades, streams, and career details.
2. Advantages: Strong consistency, reliable transactions, and compatibility with Java.



Implementation Plan

The "Univate 1.0 - CSE Stream Guidance System" development will be done in several steps. First, we'll plan and gather requirements by defining the problem, objectives, and user needs. In the design phase, we'll create wireframes for the platform's pages and design the database structure. Next, in frontend development, we'll build the user interface using React and TailwindCSS, and manage state with Redux. On the backend, we'll set up Spring Boot with MySQL to handle user login, GPA calculations, and stream recommendations. Then, we'll integrate the frontend and backend, test the platform, and gather user feedback. Afterward, we'll deploy the system to cloud services like AWS and Vercel. Finally, we'll monitor user feedback and plan future improvements, such as adding AI-based suggestions and gamified features.





National Impact

The Stream Selection Project aims to address the challenges faced by undergraduate students in selecting their academic paths within Computer Science and Engineering (CSE). Its implementation can have the following significant impacts on a national level:

- **Enhanced Education System Efficiency:** The platform enables informed decision-making, reducing dropouts, and helps institutions allocate resources effectively.
- **Bridging the Skills Gap:** The platform aligns education with industry needs, producing career-ready graduates who contribute to the workforce.
- **Promoting Innovation and Research:** It fosters specialization in key areas, enhancing national competitiveness in global technological advancements.
- **Equitable Access to Guidance:** The platform democratizes stream selection, offering equal access to guidance for students from all backgrounds.
- **Fostering Lifelong Learning:** It motivates students to pursue lifelong learning and provides reskilling opportunities for graduates.

Expected outcomes

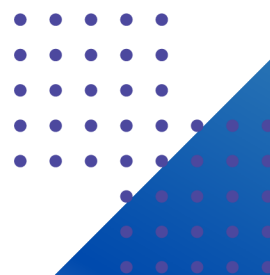
- **Improved Stream Selection for Students:** Tailored stream recommendations and informed decision-making enhance alignment with career goals and academic interests.
- **Academic Performance Monitoring:** Automatic GPA calculation and data-driven planning help students track progress and plan future academic choices.
- **Enhanced Career Guidance:** Clear career path awareness and informed decisions align stream selection with job opportunities and market trends.
- **Increased Student Engagement:** Interactive UI/UX and real-time updates make the platform engaging, motivating students to improve performance.
- **Academic Performance Insights for Institutions:** Student data helps institutions make data-driven decisions on resource allocation and curriculum improvements.
- **Bridging the Skills Gap:** The platform aligns academic paths with industry needs, preparing career-ready graduates with market-relevant skills.
- **Promoting Lifelong Learning:** The platform encourages continuous learning and reskilling for students and graduates.
- **Enhanced Student Support and Access:** Equitable access to resources and 24/7 availability reduces disparities in academic and career planning.

Conclusion

Univate 1.0 - CSE Stream Guidance System is designed to help Computer Science and Engineering students make better decisions about their academic journey. It offers personalized guidance to help students choose the right stream that matches their interests and career goals, while also tracking their academic performance and providing career insights.

The interactive and data-driven platform allows students to monitor their progress and stay motivated. By digitizing the CSE handbook and providing career advice, it makes valuable resources easily accessible. **Univate 1.0** also helps educational institutions by offering insights for better resource allocation and adjusting their programs to meet industry needs. This ensures that students are well-prepared for the job market.

The platform ensures that all students, regardless of their background, have equal access to guidance and resources. This makes **Univate 1.0** a tool that not only benefits individual students but also contributes to the education system, workforce development, and national economic growth. Ultimately, it helps students make informed academic choices, prepare for successful careers, and support the development of a competitive and tech-savvy society.





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