

Skillence – Job Quest

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ABSTRACT: Skillence–JobQuest is an all-inclusive interactive web-based tool that aims at equipping engineering students with all the requisites required by the industry. Acknowledging the difficulties faced by the students in managing the large amounts of unorganized content available for placements, Skillence provides the users with a very organized environment for preparation. The platform consists of an interactive four-month long roadmap called 'Aptitude Mastery', customized skill evaluation using diagnostic tests and curated resource libraries for some of the basic courses taught during the undergraduate programs like Operating Systems, Computer Networks, DBMS, and Computer Architecture. Moreover, the platform also consists of industry-level DSA preparation sheets and a CMS system for easy content management. With a futuristic approach of a responsive web framework, progressive difficulty levels, and progress tracking mechanisms, Skillence prepares students for competitive placement drives and software engineer interviews.

KEYWORDS: Placement Preparation, Aptitude Roadmap, Career Assessment / Diagnostic Quiz, Data Structures and Algorithms (DSA), Computer Science Core Subjects (OS, CN, DBMS, COA), Progress Tracking, EdTech Platform, Content Management System (CMS), Software Engineering Interviews, Interactive Learning.

I. INTRODUCTION

Getting a software engineering job right out of college is incredibly competitive, and it takes a lot more than just a good GPA. Today's interviews demand a mix of quick math and logic skills, deep knowledge of core subjects like Operating Systems, and heavy practice with Data Structures and Algorithms (DSA). While colleges do a great job teaching the theory, there's a huge gap when it comes to actually clearing these practical interview rounds. To make matters worse, students are constantly bombarded with "the best" resources online. Instead of being helpful, this massive overload of YouTube tutorials, courses, and coding websites leaves students feeling overwhelmed, confused, and prone to burnout.

Because of all this clutter, a student's preparation usually becomes a scattered mess. You'll often see them juggling a dozen different tabs: one website to practice aptitude quizzes, a messy Excel sheet to track which coding problems they've solved, another platform for mock tests, and a pile of handwritten notes for their core subjects. It's exhausting to keep switching between platforms, and there hasn't really been a single, clean workspace that brings all the best resources together and actually guides students on what to study next.

That's exactly why Skillence—JobQuest was built. It's an all-in-one preparation hub designed to take the chaos out of placement prep and replace it with a clear, step-by-step game plan. The platform features a structured 4-month aptitude roadmap, complete with a diagnostic quiz that figures out exactly where a student should start. It also brings together the best study materials for core computer science subjects and integrates popular DSA tracking sheets right into the website. With a clean dashboard to visualize their progress, Skillence—JobQuest helps students stop worrying about how to organize their prep and lets them focus purely on learning.

II. LITERATURE SURVEY

The research paper "Smart and Automated College Placement System" examines automated systems for college placements, including structured aptitude practice modules. However, the execution is often rigid and lacks adaptive difficulty levels or continuous ML-based skill gap tracking. [1]

The research paper "Learning Analytics for Personal Learning Environments: Determining Journal Publication Trends" examines and validates the need for unified Personal Learning Environments (PLEs) that track comprehensive skill

development. However, it has a broad bibliometric focus and doesn't provide a functional, unified technical framework for coding and behavioral assessments. [2]

The research paper “Adaptive Learning Using Artificial Intelligence in e-Learning: A Literature Review” examines the critical role of intuitive interfaces (UI/UX) for deploying complex AI educational analytics effectively. However, it focuses broadly on AI literature and lacks specific UI/UX implementation guidelines for dense, technical coding assessment platforms. [3]

III. METHODOLOGY

To bring Skillence—JobQuest to life, we approached the development step-by-step using a modern, full-stack setup: PostgreSQL, Express, React, and Node (the PERN stack), combined with Firebase to keep logins secure and simple. We wanted the student side to feel incredibly smooth and fast, so we built the frontend as a Single Page Application using React and Vite, dropping in Framer Motion for sleek micro-animations and Recharts to make the progress dashboards visually satisfying. Behind the scenes, the Express and Node backend runs the show, securely connecting to our PostgreSQL database to keep everyone's profiles, quiz scores, and study progress safely saved. To make sure everything stays organized and secure, we built strict "roles" into the system. This creates a clear dividing line between the engaging student experience—where you take diagnostic quizzes and check off items on your Aptitude or DSA roadmaps—and a hidden, secure admin dashboard where instructors can easily add new questions or update the curriculum without ever touching the code.

IV. SYSTEM ARCHITECTURE

When building Skillence—JobQuest, we cleanly divided the application into three interconnected layers—the visuals, the brain, and the memory—to keep the system fast, secure, and easy to maintain. The "visuals" are handled by our React frontend, which provides the incredibly smooth animations, interactive dashboards, and DSA tracking sheets you see on your screen, relying on Firebase to safely handle your user logins. Behind the scenes, our Express and Node.js backend acts as the "brain," catching the data sent from the frontend to calculate scores and ensure strict security rules, like stopping a regular student from accessing the Admin curriculum dashboard. Finally, our PostgreSQL database serves as the "memory," using a translator tool called Sequelize to permanently and securely save your user profile, quiz results, and roadmap progress so you can pick up exactly where you left off.

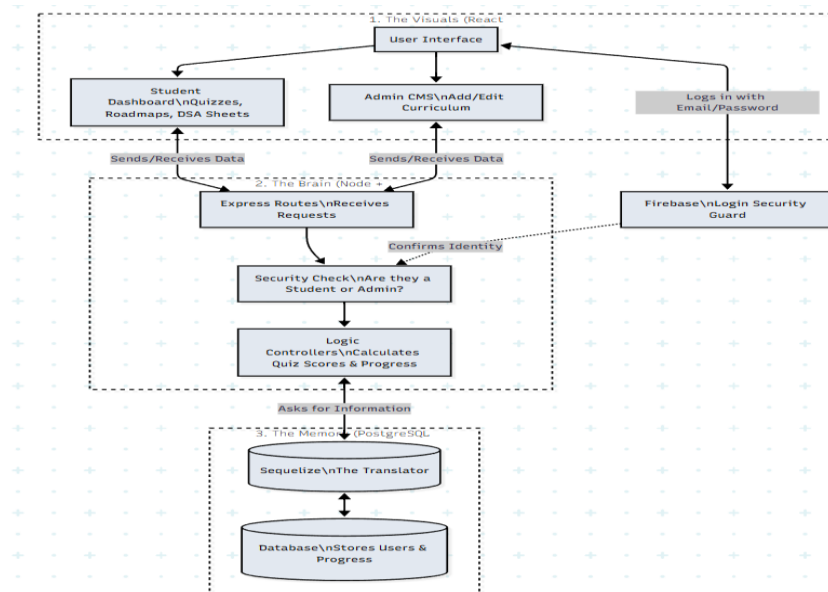


Fig 1.1 System Architecture

V. OUTPUT SCREENS

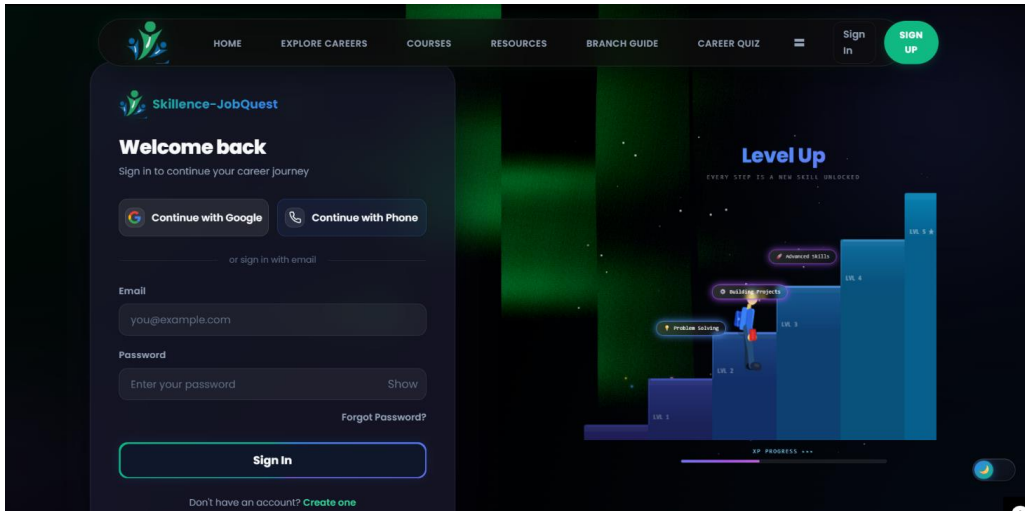


Fig 2.1 Login/Signup Interface

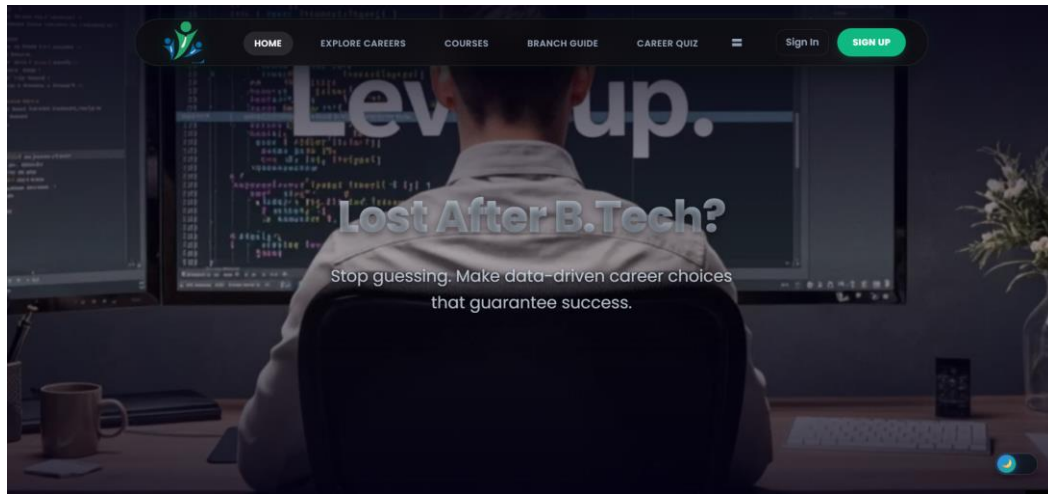


Fig 2.2 Home Interface

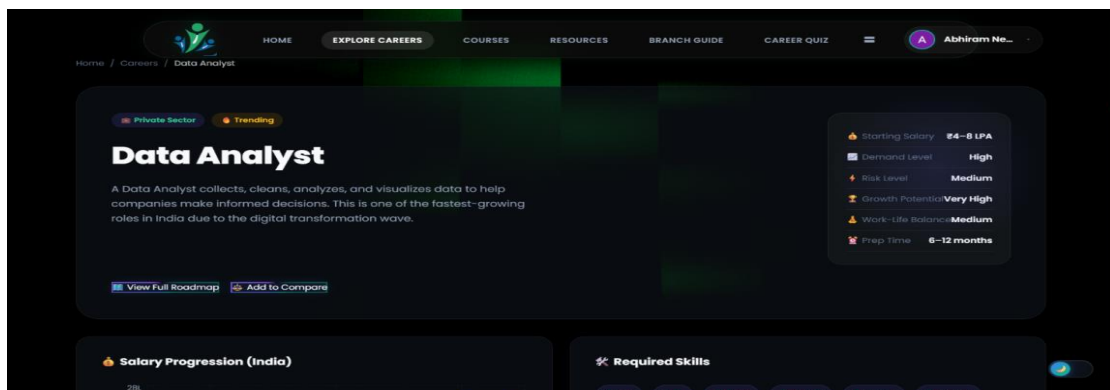


Fig 2.3 Careers Page



Fig 2.4 Resources Page

VI. CONCLUSION

In the end, Skillence—JobQuest successfully tackles one of the biggest headaches engineering students face today: the overwhelming, chaotic nature of placement preparation. By bringing together a structured aptitude roadmap, dynamic diagnostic quizzes, curated core subjects, and interactive DSA tracking sheets all under one sleek, easy-to-use platform, it completely removes the stress of figuring out "what to study next." Ultimately, this project proves that when students are given a clean, gamified, and highly organized track to run on—rather than a messy pile of random links and spreadsheets—they can stop worrying about organizing their resources and instead pour all their energy into mastering the actual skills they need to land their dream job.

VII. FUTURE SCOPE

Even though Skillence—JobQuest already does a fantastic job of organizing placement prep, there is so much room for it to grow into an even more powerful daily tool. Moving forward, we would love to integrate an AI-powered tutor directly into the dashboard. Alongside that, building a live code compiler directly into the platform is a massive next step. Instead of tracking their progress on our platform and then jumping over to an external site to actually write the code, students would be able to write, compile, and test their programming logic right inside our website. Beyond just the technical upgrades, we want to make the platform feel more alive and community-driven. We plan to add peer-to-peer mock interview scheduling and discussion forums, allowing students to share recent company interview experiences and actually practice speaking with one another. To keep motivation high during those long months of studying, introducing gamification features—like earning badges for daily study streaks or climbing a campus-wide leaderboard—would make the grueling prep process feel much more rewarding. Eventually, the platform could even use a student's quiz scores and study progress to act as an intelligent career counselor, offering predictive analytics to tell them exactly how ready they are to clear an interview at a specific company.

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