

SkillBridge

AI-Powered Career Navigation Platform

Java · Spring Boot · Microservices · Groq AI · MySQL · Docker · Railway

OVERVIEW

SkillBridge is a full-stack AI-powered career development platform. It analyzes a user's current skills, identifies skill gaps for their target role, generates a personalized 3-month week-by-week learning roadmap using Groq AI, builds an ATS-ready PDF resume, and connects users to real job opportunities — all in one place. The platform is built as a microservices system and deployed live on Railway.

ARCHITECTURE

The system is split into 4 independent Spring Boot microservices communicating over HTTP REST:

- ▶ **user-service** Handles user registration, login, and JWT authentication. The frontend (HTML, CSS, JavaScript) is bundled inside this service as static resources — so all UI is served from here.
- ▶ **ai-service** The core AI engine. Calls the Groq API (LLaMA 3.1) to generate roadmaps, performs skill gap analysis, calculates career readiness score, generates AI-written resume summaries, and builds PDF resumes using iText.
- ▶ **notification-service** Receives an HTTP POST from ai-service after roadmap generation and delivers the roadmap to the user's inbox via SendGrid's HTTP Web API.
- ▶ **job-service** Manages job trend data and powers the job search and internship finder features across multiple platforms.

All 4 services are deployed as separate Docker containers on **Railway** and share a single **MySQL database hosted on Aiven Cloud**.

HOW IT WORKS

- ▶ **Step 1:** User opens the website. The HTML page is served from user-service. User registers with their name, email, password, current skills, target role, education level, and country.
- ▶ **Step 2:** On login, user-service validates credentials and returns a JWT token. This token is attached to all subsequent API calls for authentication.
- ▶ **Step 3:** User enters current skills and target role in the dashboard. ai-service calls the Groq API (LLaMA 3.1), generates a full 3-month week-by-week personalized roadmap, and saves it to MySQL.
- ▶ **Step 4:** Immediately after roadmap generation, ai-service sends an HTTP POST to notification-service. notification-service calls the SendGrid HTTP API and delivers the roadmap to the user's email inbox.
- ▶ **Step 5:** The dashboard shows a career readiness score (percentage) and a radar chart comparing the user's skills against industry expectations — built with Chart.js.
- ▶ **Step 6:** In Resume Builder, the user fills in their details. ai-service returns an AI-written professional summary and certification suggestions. iText generates a clean, downloadable ATS-ready PDF resume.
- ▶ **Step 7:** In Job Search, the user enters a skill and selects a country. The platform returns filtered job links from LinkedIn, Naukri, Indeed, Glassdoor, and Wellfound. The Internship Finder covers Internshala, RemoteOK, and more.

TECH STACK

- ▶ **Language:** Java 17
- ▶ **Framework:** Spring Boot 3
- ▶ **Database:** MySQL 8 — Aiven Cloud
- ▶ **ORM:** Hibernate / Spring Data JPA
- ▶ **Security:** Spring Security + JWT
- ▶ **AI:** Groq API — LLaMA 3.1 8B Instant
- ▶ **Email:** SendGrid HTTP Web API
- ▶ **PDF Generation:** iText Library
- ▶ **Frontend:** HTML5, CSS3, JavaScript
- ▶ **Charts:** Chart.js (Radar Chart)
- ▶ **Containerization:** Docker
- ▶ **Deployment:** Railway

KEY FEATURES

- ▶ **AI Roadmap Generator** — Personalized 3-month, week-by-week learning plan generated by Groq AI based on skill gaps.
- ▶ **Skill Gap Analysis** — Identifies exactly which skills are missing for the user's target role before generating the roadmap.

- ▶ **AI Career Score** — A readiness percentage calculated from how much of the required skill set the user already has, with honest feedback.
- ▶ **Skill vs Industry Chart** — Radar chart built with Chart.js mapping the user's current skills against what the industry expects.
- ▶ **Resume Builder** — AI-generated professional summary and certifications, with live browser preview and iText PDF download.
- ▶ **Progress Tracker** — Check off completed weeks from the roadmap. A live progress bar updates in real time.
- ▶ **Job & Internship Search** — Filtered job links across LinkedIn, Naukri, Indeed, Glassdoor, Wellfound, Internshala, RemoteOK by skill and country.
- ▶ **Email Notification** — Full roadmap automatically delivered to the user's inbox via SendGrid after generation.
- ▶ **Dark / Light Mode** — Full theme toggle across the entire platform.

CHALLENGES & SOLUTIONS

- ▶ **SMTP Blocked on Railway:** Railway free tier blocks outbound SMTP ports 587 and 465. Solved by replacing JavaMail with SendGrid's HTTP Web API which runs over HTTPS — not blocked.
- ▶ **Kafka Without a Broker:** Kafka was not viable on Railway without a running broker. Solved by replacing Kafka event publishing with direct HTTP REST calls between services.
- ▶ **Groq Model Decommissioned:** The llama3-8b-8192 model was shut down. Solved by upgrading to llama-3.1-8b-instant.
- ▶ **Tables Not Auto-Creating:** Database tables were not being created on Railway. Solved by setting `spring.jpa.hibernate.ddl-auto=update` as a Railway environment variable.