Project Requirements Document (PRD)

Project Name: Placement & Internship Trend Analyzer (PITA)

Target Audience: B.Tech Students

Document Version: 1.0

1. Project Overview

The Placement & Internship Trend Analyzer is a data-driven web application designed specifically for B.Tech students. It aims to bridge the gap between academic preparation and industry expectations by analyzing historical placement data, extracting actionable insights, recommending personalized learning paths, and facilitating networking with alumni for guidance and referrals.

2. Core Objectives

- To provide transparent and actionable insights into campus and off-campus placement trends.
- To map the direct correlation between specific technical skills and offered salary packages.
- To curate personalized learning roadmaps and video resources based on real-time industry demand.
- To create a dedicated ecosystem for junior-senior interactions regarding interview experiences and referrals.

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3. Functional Requirements

3.1 Data Analytics Module

This module handles the ingestion and processing of placement data.

- **Company Profiles:** Track recruiting companies, their sectors (IT, Core, Consulting), and hiring frequency.
- **Package Tracking:** Record Base Pay, CTC, bonuses, and stipends for internships.
- **Skill Extraction:** Parse job descriptions or placement records to identify required technical and soft skills (e.g., React, Python, AutoCAD, System Design).

3.2 Insights & Visualization Module

This module converts raw data into easily digestible visual formats for students.

- **Skill vs. Salary Correlation:** An analytical engine that calculates and displays which skills yield the highest average packages.

- **Year-Wise Trends:** Line graphs showing the rise or fall in demand for specific roles, skills, or overall hiring volume over the years.
- **Package Distribution:** Histograms or box plots showing the spread of salary packages (e.g., mass recruiters vs. dream/super-dream companies).
- **Skill Demand Charts:** Dynamic bar charts and pie charts highlighting the most frequently requested skills by top recruiters.

3.3 Stream-Specific Customization (B.Tech Focus)

The platform must filter all data, insights, and roadmaps based on the user's specific B.Tech branch.

- **Branch Filtering:** Seamless toggle between streams like Computer Science (CSE), Electronics (ECE), Mechanical (ME), Civil (CE), etc.
- **Contextual Analytics:** Displaying IT/Software trends for CSE/IT students, and Core industry trends (e.g., VLSI, CAD, Manufacturing) for ECE/ME students.

3.4 Learning & Recommendation Engine

This module acts as the career preparation hub.

- **Dynamic Roadmaps:** Step-by-step career path generation (e.g., "Roadmap to Full Stack Developer" or "Roadmap to Embedded Systems Engineer") based on the current highest-paying skills.
- **Video Lecture Recommendations:** Integration with platforms like YouTube to embed or link top-rated tutorials and lectures specific to the user's identified skill gaps.

3.5 Community & Networking Hub

A dedicated space for peer-to-peer and alumni-to-student interaction.

- **Experience Sharing:** A forum or blog section where seniors can post their interview experiences, rounds, and questions asked.
- **Referral System:** A portal where seniors can post referral opportunities, and eligible students can request referrals by submitting their platform-generated skill profile.
- **Direct Messaging/Q&A:** A lightweight communication tool to ask seniors specific questions.

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4. Non-Functional Requirements

- **User Interface (UI):** Must be intuitive, dashboard-oriented, and mobile-responsive, prioritizing data readability.
- **Performance:** Data visualizations and charts must load quickly without lagging, even with large datasets.
- **Security:** Ensure user data privacy, especially regarding personal contact information and academic records. Implement secure authentication (e.g., Google OAuth).

- **Scalability:** The database architecture must be designed to accommodate adding new colleges, branches, and thousands of new placement records annually.

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5. Suggested Technology Stack

- **Frontend:** React.js or Next.js (for dynamic charting and responsive UI), Tailwind CSS.
- **Data Visualization:** Chart.js, D3.js, or Recharts.
- **Backend:** Node.js with Express, or Python (Django/FastAPI) which is excellent for handling data analysis and ML models.
- **Database:** PostgreSQL (for structured placement data and user profiles) or MongoDB (for flexible interview experience posts).
- **Data Processing:** Python (Pandas, NumPy) for calculating correlations and trends before sending them to the frontend.