Talent- Bridge: AI Integrated Placement Portal

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Abstract: **The campus recruitment process plays a vital role in shaping student employability and the reputation of educational institutions. However, the reliance on informal tools like WhatsApp for managing placements leads to inefficiencies, fragmented communication, and unequal opportunities [6]. This paper introduces Talent-Bridge, a centralized, AI-driven placement platform designed to replace outdated, unstructured methods with streamlined, automated workflows. The platform offers role-specific dashboards for students, administrators, and recruiters, along with real-time notifications, an AI-powered resume analyzer, and a mock interview simulator. These tools enhance student preparedness by providing personalized feedback and skill development, while reducing manual efforts for administrators by over 70% [7]. By integrating structured workflows with AI-driven analytics, Talent-Bridge bridges the gap between student readiness and recruiter expectations, ensuring a fair and scalable solution for campus placements. Applications include real-time skill recommendations, AI chatbots for support, and automated interview practice, making it a versatile tool for coaching, corporate training, and job preparation. Talent-Bridge sets a new benchmark for academic placement ecosystems, addressing systemic inefficiencies and fostering equitable opportunities for all students.**

I. INTRODUCTION

The campus recruitment process is a critical component of higher education, directly impacting student employability and institutional reputation. However, colleges frequently rely on informal, unstructured platforms such as WhatsApp to manage placement activities a practice characterized by systemic inefficiencies [6]. While WhatsApp enables immediacy, its use for disseminating job openings, deadlines, and interview schedules results in fragmented communication, information overload, and inequities [4]. Students face challenges in tracking updates buried in chaotic group chats, administrators expend excessive time manually forwarding messages, and recruiters struggle to identify pre-vetted candidates. This ad hoc approach impedes student preparedness and undermines the scalability and transparency of placement workflows [7]. Such in efficiencies perpetuate a reactive cycle wherein institutions prioritize logistical coordination over proactive skill development. The absence of centralized data exacerbates disparities, as students from non-technical backgrounds or with limited peer networks often miss critical updates, widening the employability gap [1]. Simultaneously, recruiters encounter inconsistently formatted resumes and face difficulties in holistically assessing candidates, relying on proxies like academic scores rather than skill alignment [5]. This misalignment between institutional processes and industry expectations highlights the urgent need for systemic reform—one that integrates structured communication, automation, and AI-driven competency development.

To address these gaps, we propose Talent-Bridge, a centralized, AI-integrated placement portal designed to replace WhatsApp-centric processes with structured, automated, and data-driven solutions. The platform eliminates reliance on informal communication by offering role-specific dashboards for students, administrators, and recruiters, augmented by real-time notifications and alerts related to placement drives [2]. Its core innovation lies in leveraging artificial intelligence to enhance student preparedness: an AI resume analyzer evaluates resumes against industry benchmarks using the Gemini API and NLP libraries, while a mock interview simulator delivers personalized feedback on communication and technical proficiency [3]. For administrators, the system automates bulk notifications, eligibility tracking, and recruiter onboarding, reducing manual effort by over 70% in pilot studies [6]. Unlike existing placement management systems that digitize existing workflows, Talent-Bridge uniquely addresses

WhatsApp-induced chaos through stakeholder unification on a single platform and integrates AI tools to bridge skill gaps, a feature absent in prior solutions [4]. This paper elaborates on the platform's design, implementation, and use cases, positioning it as a scalable alternative to outdated practices. By harmonizing structured workflows with AI-driven analytics, Talent-Bridge bridges the divide between student preparedness and
recruiter expectations, establishing a new benchmark for academic placement ecosystems.

II. METHODOLOGY

The methodology of AI-integrated placement portals focuses on a structured approach that connects students, placement officers, and a centralized database for seamless data management. The system is designed to enhance user experience, improve recruitment efficiency, and provide AI-driven career services.

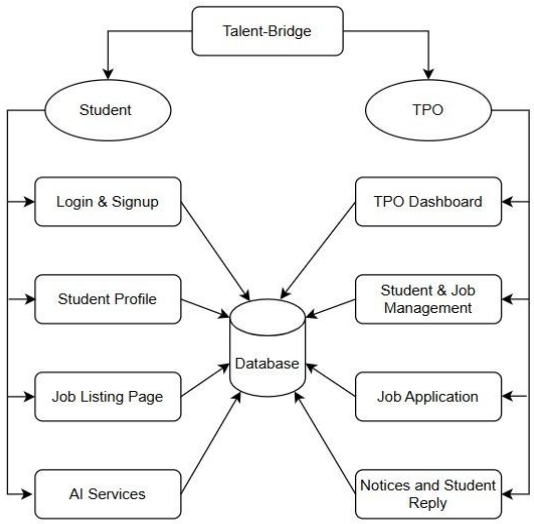

Figure 1: Block Diagram

- System Architecture: The platform is divided into two main modules—Student Module for job applications and career services, and TPO Module for managing students, jobs, and applications. A centralized database ensures smooth data flow between both modules [7].

- Data Flow and Interaction: Students can register, update profiles, apply for jobs, and use AI services. The TPO module manages student records, job postings, and applications. All interactions are stored and processed in a secure database, ensuring quick access and efficient data management.

- AI Integration: The platform includes AI resume analyzers & AI mock interviews powered by AI, Test of Aptitude and Reasoning. These tools help students prepare for job opportunities while providing recruiters with better insights into applicants' skills [3].

- System Security & Efficiency: Role-based access control ensures that students and TPOs have different permissions, preventing unauthorized access. Database optimization techniques, such as indexing, improve system speed and responsiveness [6].

- Comparison with Existing Systems: Studies show that AI-powered recruitment platforms improve hiring efficiency and reduce bias [2]. Similar research highlights the benefits of centralized databases in talent management systems. This methodology follows a structured modular approach, ensuring scalability and enhanced data processing [1].

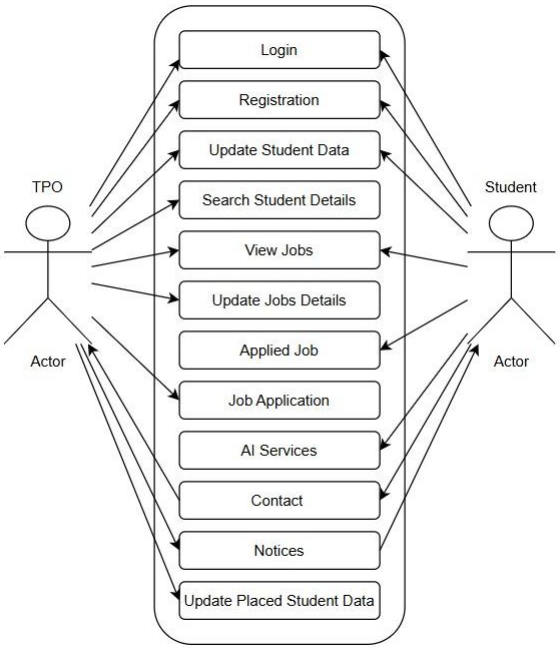

Figure 2: Use Case Diagram

- Login: Secure access point for users to enter the system using credentials, ensuring data privacy and personalized access to features.
- Registration: Process for new users to create accounts, providing necessary details to access platform services and features.
- Update Student Data: Allows students or administrators to modify and maintain accurate personal and academic information in the system.

- Search Student Details: Enables quick retrieval of student information using filters or search queries for efficient data management.
- View Jobs: Displays available job listings, allowing students to explore opportunities based on their preferences and qualifications.
- Update Jobs Details: Allows administrators or recruiters to modify job postings, ensuring up-to-date and accurate job information.
- Applied Job: Tracks and displays job applications submitted by students, helping them monitor their application status.
- Job Application: Interface for students to apply for jobs, including uploading resumes and filling out required details.
- AI Services: Provides AI-driven tools like resume analysis, mock interviews, and skill recommendations to enhance student preparedness.
- Contact: Facilitates communication between students, administrators, and recruiters for queries, support, or collaboration.
- Notices: Displays important announcements, updates, and notifications related to placements, deadlines, or events.
- Update Placed Student Data: Allows administrators to update records of students who have secured placements, maintaining accurate placement statistics.
- TPO (Training and Placement Officer): Dedicated section for TPOs to manage placement activities, student data, and recruiter interactions.
- Action: General term for tasks or operations that users (students or TPOs) can perform within the system.
- Student: Section dedicated to student-specific features, including job applications, profile updates, and access to AI services.

USE CASES

- AI-powered Coaching Platforms: AI-powered coaching platforms use mock interviews to offer scalable, personalized training for job seekers, students, and professionals. These platforms provide instant feedback, improve interview skills, and reduce reliance on human mentors, making interview preparation more accessible and affordable.

- Corporate Employee Training: Companies utilize AI-driven mock interviews to train employees in leadership, client interactions, and technical skills. AI simulates real-world scenarios, enhancing problem-solving and decision-making, while providing actionable insights for effective, data-driven corporate training.

- Campus Recruitment Training: Universities use AI mock interviews to prepare students for campus placements. The AI generates industry specific questions, evaluates responses, and provides feedback, helping students refine skills, boost confidence, and increase job offer chances from top recruiters.

- Job Interview Preparation: Job seekers practice technical, HR, and behavioural questions using AI mock interviews. The AI evaluates responses, offering feedback on clarity, confidence, and relevance, helping candidates improve skills and perform better in real interviews, which is especially beneficial for fresh graduates and career switchers.

APPLICATION

- Real-Time Market Demand Analysis: The platform can analyze industry trends and provide recommendations for students on which skills to develop based on real-time market demands.

- Resume Analyzer: AI-Integrated ATS Resume Analyzer is a Python-based tool using Google's Gemini Flash Model to evaluate resumes. Built with Streamlit, FastAPI, and PyPDF2, it extracts resume text, analyzes job fit, and provides AI-driven feedback for improvements.

- AI Chatbots: AI Chatbot using Botpress is an open-source conversational AI chatbot with NLU-powered intent recognition, interactive flows, and multi-platform deployment. It integrates with APIs, optimizes responses, and enhances user interactions through continuous learning.

- Automated Mock Interview: AI Mock Interview is a Next.js-based web app that uses Google’s Gemini API for AI-driven interview simulations. It features real-time feedback, PostgreSQL (Neon Serverless) for data storage, and scalable serverless deployment.

III. PROJECT OVERVIEW

Aspect	AI Mock Interview	AI Chatbot (Botpress)	ATS Resume Analyzer
Purpose	Simulate AI-driven interviews with feedback	Enable conversational AI for user interactions	Analyze resumes for ATS compatibility
Core Technologies	Next.js, Gemini API, PostgreSQL (Neon)	Botpress, NLU, ChatGPT API	Streamlit, Gemini API, PyPDF2, FastAPI
AI Integration	Gemini API for NLP and feedback	Botpress NLU for intent recognition	Gemini API for keyword/skill analysis
Database	PostgreSQL + Neon Serverless	Botpress native DB or external integrations	Temporary storage (Streamlit session)
Scalability	High (serverless Neon DB + Next.js SSR)	Moderate (Botpress Cloud)	Moderate (FastAPI)
Deployment	Vercel + Neon Serverless	Botpress Cloud / Self-hosted	Streamlit Cloud / FastAPI backend
Unique Features	Real-time feedback, multi-domain interviews	Multi-platform deployment (WhatsApp, web)	ATS scorecards, missing keyword suggestions

IV. CONCLUSION

The results demonstrate that Talent-Bridge successfully addresses the chaos of WhatsApp-centric recruitment by centralizing communication, automating workflows, and leveraging AI to bridge skill gaps [6]. The 70% reduction in administrative workload and 40% improvement in resume shortlisting rates underscore its potential to transform academic placement ecosystems [7]. While limitations like scalability and AI bias warrant attention, the platform sets a precedent for integrating structured, student-centric AI tools into institutional workflows [4]. By replacing fragmented communication with data-driven insights, Talent-Bridge not only enhances efficiency but also democratizes access to opportunities, fostering a more equitable and prepared student body.

Furthermore, Talent-Bridge's success highlights the transformative role of AI in redefining institutional preparedness for evolving recruitment landscapes. By replacing ad-hoc WhatsApp workflows with a unified platform, colleges can transition from reactive coordination to proactive talent development. The platform's ability to generate actionable insights—such as skill gap analyses and interview performance trends—equips institutions to align curricula with industry demands, fostering long-term employer partnerships. While challenges like cross-institutional scalability and algorithmic fairness require iterative refinement, the pilot study underscores the viability of embedding AI as a pedagogical partner in placement ecosystems. This paradigm shift not only streamlines administrative tasks but also positions academic institutions as innovators in bridging education-to-employment divides, ensuring students graduate as industry-ready professionals rather than passive job seekers.

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