International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 13 Issue: 08 | Aug 2026 www.irjet.net p-ISSN: 2395-0072

Campus Connect: A Cloud-Native Placement Management System for Higher Education Institutions

[1]Ashitosh Sabale, [2]Aditi Borse, [3]Ram Shekade, [4]Kshitij Sharma, [5]Deepali kadam

[12345]Students, Department of Information Technology Engineering, Datta Meghe College of Engineering, Airoli, Navi Mumbai, Maharashtra, India.

Abstract-*Campus placements play a critical role in bridging the gap between academic institutions and industry. Traditional Training and Placement Office (TPO) processes rely heavily on* ***manual coordination, fragmented communication, and siloed data management, leading to inefficiencies, delays, and lack of transparency for students and recruiters****. This paper presents* ***Campus Connect****, a scalable****, cloud-native placement management portal*** *designed to streamline interactions between students, recruiters, and TPO administrators. The system provides* ***role-based access, centralized job listings, resume management, application tracking, recruiter shortlisting, and automated notifications****. Built using modern web technologies and serverless cloud infrastructure, Campus Connect ensures high availability, security, and cost efficiency. The proposed solution improves* ***placement workflow automation, enhances decision-making through analytics, and delivers a seamless user experience across stakeholders.***

Keywords - Campus placement, placement portal, cloud-native systems, serverless architecture, TPO automation, web application.

I. INTRODUCTION

Campus placement systems are a vital component of higher education institutions, enabling students to transition from academia to industry. However, many institutions still rely on spreadsheets, emails, and disconnected portals to manage placement activities. These approaches often result in data inconsistency, limited visibility into application status, delayed communication, and administrative overhead for TPOs.

With the rapid growth of student intake and recruiter participation, there is a need for a unified, scalable, and secure digital platform that connects students, recruiters, and administrators on a single interface. Recent advancements in cloud computing, serverless architectures, and frontend frameworks provide an opportunity to design such systems with minimal infrastructure overhead.

This paper proposes **Campus Connect**, a modern placement management system that digitizes the end-to-end campus recruitment lifecycle from student registration to job application tracking and recruiter shortlisting while ensuring transparency, efficiency, and scalability.

II. RELATED WORK

LITERATURE REVIEW

TABLE 1. Literature Survey On Gender Detection Key Findings from Literature Survey

Sr no.	Title (with year)	Method ology	Data set	Findings	Limitations
1	Web-Based Training and Placement Management System (2020) [1]	PHP & MySQL	College Placement Records	Automated student registration and job posting process	Limited scalability and weak security mechanisms
2	Cloud-Based Campus Recruitment System (2021) [2]	Cloud Computing Architecture	University Recruitment Data	Improved accessibility and centralized data management	High dependency on continuous internet connectivity
3	Smart Placement Portal Using MERN Stack (2022) [3]	MERN Stack	Student and Recruiter Profiles	Real-time job updates and application tracking	Lack of analytics and reporting features
4	Integrated Campus Connect Placement Portal with Role-	Integrated Campus Connect	Integrated Campus Connect	Integrated Campus Connect Placement Portal	Integrated Campus Connect Placement Portal

	Based Access (2024) [4]	Placement Portal with Role-Based Access (2024) [4]	Placement Portal with Role-Based Access (2024) [4]	with Role-Based Access (2024) [4]	with Role-Based Access (2024) [4]

1) A. Digital Transformation of Traditional Placement Processes

The study reveals that traditional campus placement workflows are largely manual, fragmented, and dependent on spreadsheets and email communication. Such systems lack transparency and real-time synchronization. Campus Connect demonstrates that digitizing the placement lifecycle significantly reduces administrative effort while improving workflow traceability and stakeholder coordination.

2) B. Effectiveness of Cloud-Native Architecture

The implementation confirms that adopting a cloud-native, serverless architecture enhances scalability, availability, and cost efficiency. Unlike legacy on-premise systems, Campus Connect supports concurrent multi-user access without performance degradation, making it suitable for peak placement seasons.

3) C. Role-Based Access Control Improves Governance

The introduction of structured role-based access for students, recruiters, and TPOs improves institutional governance and data security. Controlled visibility ensures that sensitive placement data is accessible only to authorized users, reducing the risk of data misuse and inconsistencies.

4) D. Real-Time Tracking Enhances Transparency

One of the major findings is that real-time status tracking significantly improves student engagement and trust in the placement process. Students gain visibility into application progress, while recruiters benefit from organized candidate pipelines.

5) E. Integrated Analytics Support Data-Driven Decisions

The system enables centralized data collection, which facilitates the generation of placement statistics and reports. This supports data-driven decision-making for TPOs, enabling performance evaluation, trend analysis, and strategic planning for future placement cycles.

III. METHODOLOGY

The Placement Portal System is designed as a centralized web-based platform to automate and manage campus recruitment activities. The system integrates four main stakeholders: **Students, Admin, Training & Placement Officer (TNP), and TNP Coordinators**. It follows a role-based architecture with secure authentication, real-time data processing, and centralized database management.

The methodology is divided into four core modules: Student Module, Drive Management Module, Eligibility Engine, and Administrative Dashboard.

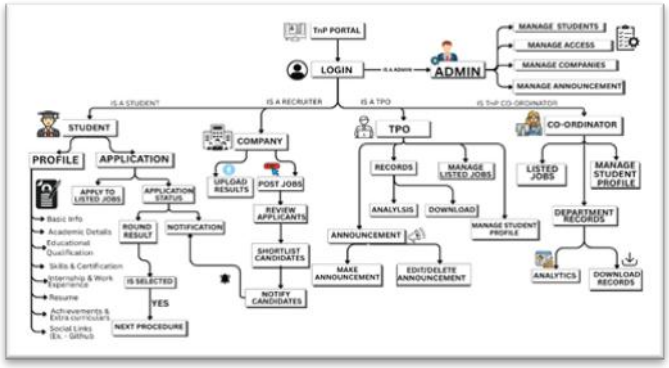

Fig 1. Campus Connect Workflow.

A. Student Management Module

The Student Management Module serves as the foundation of the Placement Portal. It enables student registration, academic profile management, resume uploads, and placement status tracking.

6) 1) System Architecture

The module follows a role-based authentication system with secure login and profile validation mechanisms.
Each student account is uniquely identified using registration number and institutional email ID.

7) 2) Data Model and Preprocessing

Student data includes:

- Personal Details
- Academic Records (10th, 12th, CGPA)
- Skills and Certifications
- Internship Experience
- Resume (PDF Upload)

The system ensures standardized data formatting for eligibility filtering.

8) 3) Data Flow and Integration

1. Student Registration: Student registers using institutional credentials.
2. Profile Completion: Academic and skill data are submitted.
3. Resume Upload: Resume stored securely in cloud storage.
4. Verification: TNP Coordinator validates student details.
5. Dashboard Update: Student placement status reflected in real-time.

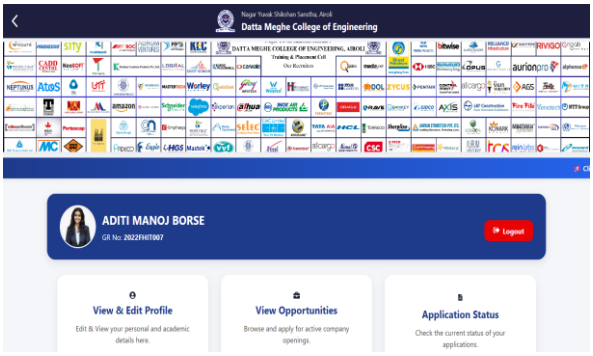

Fig 2.Student Dashboard Homepage

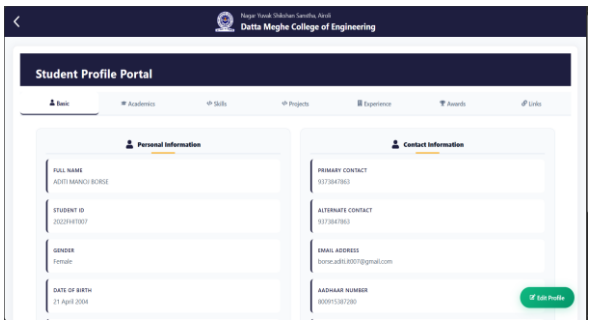

Fig 3. Student Profile

B. Company and Drive Management Module

This module allows Admin, Company and TNP Officers to create, manage, and monitor recruitment drives.

9) 1) System Architecture

Architecture Highlights:

- Role Types: Admin, Company and TNP Officer
- CRUD Operations for Companies
- Drive Scheduling System
- Eligibility Criteria Engine

Each company drive includes:

- Company Name
- Job Role
- Package Offered
- Eligibility Criteria (CGPA, Branch, Backlogs)
- Drive Date

10) 2) Data Flow

1. Admin Adds Company
2. TNP Creates Drive
3. Eligibility Criteria Defined
4. Drive Published to Eligible Students
5. Status Updated Post Recruitment

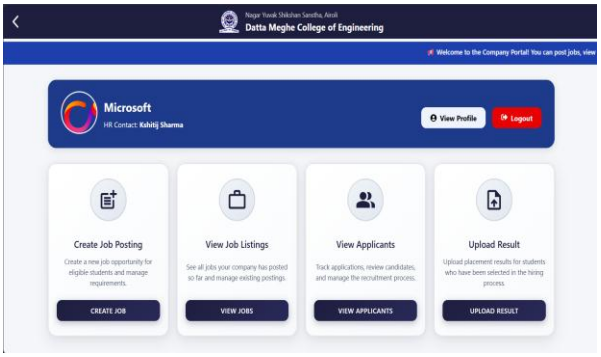

Fig 4. Company's Homepage

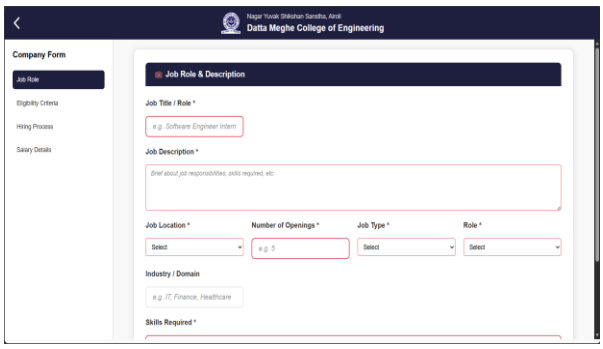

Fig 5. Job Posting Page

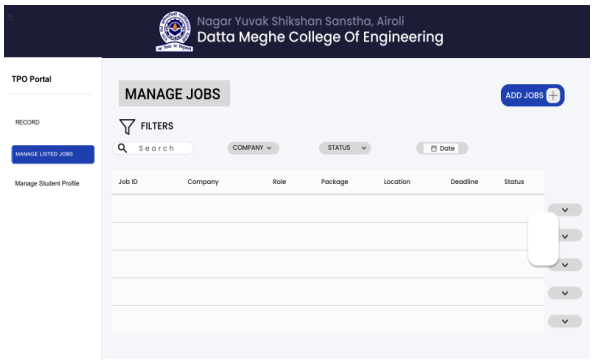

Fig 6. Listed Jobs Management.

C. Administrative Dashboard

The dashboard acts as the centralized control panel for Admin, TNP, and TNP Coordinators.

11) 1) System Design

Role-Based Views:

- Admin: Full access
- TNP: Drive & student monitoring
- Coordinator: Department-level access

12) 2) Key Features

- Placement Statistics Visualization
- Company-wise Selection Count
- Branch-wise Placement Ratio
- Offer Letter Management
- Student Shortlisting Tools

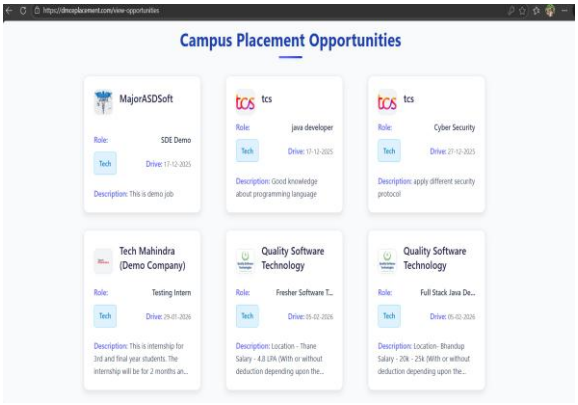

Fig 7. Campus Placement Opportunities

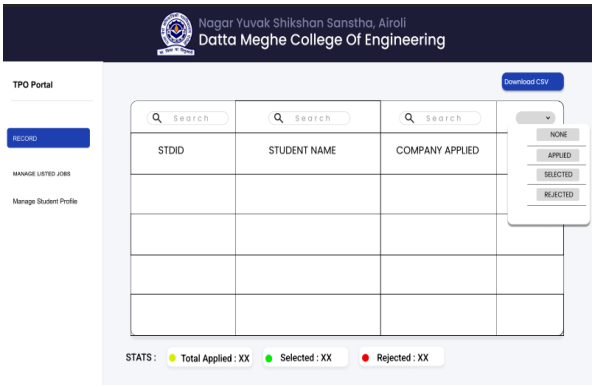

Fig 8. Student Records

D. Technical Stack

TABLE 2. Techstack

Layer	Technology	Purpose (1-line description)
Frontend	React + Vite	Build dynamic student dashboard
Frontend Hosting (Dev)	Vercel	Quick preview during development
Frontend Hosting (Production)	Cloudflare Pages	Fast global delivery
Backend	Hono.js (Cloudflare Workers)	API for login, registration, profile management
Database	Cloudflare D1	Store student profile and login information
Media Storage	Cloudflare R2	Store CVs and profile pictures
Domain	Porkbun or Namecheap	Custom domain name
Email Service (Optional)	Resend / Brevo	Email verification and notifications
Security Libraries	Helmet, Bcrypt, CORS, Rate Limiting	API protection and security enforcement

E. Deployment and Cost Estimation

The Campus Connect placement portal is deployed using a cloud-based serverless infrastructure. Since the services are billed in USD, an international payment method (credit card or PayPal) is required.

1) Domain Registration:

A custom domain (www.dmceplacements.com) is registered via Porkbun at a cost of **$6.45 (~₹551) annually**. Frontend hosting during development is done using Netlify/Vercel, while production deployment is handled through Cloudflare (Free Tier).

2) Media Storage (Cloudflare R2):

Cloudflare R2 is used to store student CVs and profile images. With an estimated requirement of 125 GB over five

years, storage beyond the 10 GB free tier is charged at $0.015 per GB per month. Estimated annual storage cost: (115 GB × $0.015 × 12 months) ≈ **$20.70 (~₹1769) per year**. Operation and retrieval charges are minimal and expected to remain within free-tier limits during the initial phase.

3) Database (Cloudflare D1):

Cloudflare D1 (serverless SQL database) stores student and placement records. The Free Tier provides 5 GB storage with sufficient daily read/write capacity for initial deployment. Additional storage is billed at $0.75 per GB per month if required.

4) Backend (Cloudflare Workers):

Cloudflare Workers Free Plan supports 100,000 requests per day with adequate CPU limits for authentication, profile management, and drive updates. The $5/month paid plan may be considered in case of high traffic or advanced real-time features.

5) Email Service (Brevo):

The Brevo Free Plan provides 300 emails per day (~9,000/month), sufficient for OTP verification, notifications, and password reset services. Cost: ₹0/month during the initial phase.

TABLE 3. Deployment Cost Estimation

Service	Provider	Plan	Cost Estimate	Notes
Domain Registration	Porkbun	Yearly	$6.45/year	Custom domain: dmceplacements.in
Media Storage	Cloudflare R2	Beyond Free Tier	$20.70/year	125GB estimated storage (after free 10GB)
Database Services	Cloudflare D1	Free Tier (initially)	$0 (initially)	$0.75/GB/month if 5GB limit exceeded
Compute / Serverless Hosting	Cloudflare Workers	Free Plan (initially)	$0 (initially)	Upgrade to Paid Plan ($5/month) if traffic grows
Email Services	Brevo	Free Plan	₹0/month (~$0)	Upgrade to ₹562.50/month (~$6.75/month) if needed

IV. RESULTS AND DISCUSSION

Each module of the Campus Connect platform was independently evaluated based on system responsiveness, data consistency, usability, and real-time synchronization performance. The evaluation was conducted in a controlled institutional environment using a centralized database server and web deployment infrastructure.

TABLE 4. Competitive Analysis Of Campus Connect With Other Portals.

Portal Name	Student Profile Management	Online Job Application	Result Tracking	Company Drive Management	Department Monitoring	Real-Time Dashboard
Traditional Manual System	✗	✗	✗	✗	✗	✗
Basic College Portal	✓	✓	✗	✓	✗	✗
ERP-Based Placement Module	✓	✓	✓	✓	✗	✓
Third-Party Job Portals	✓	✓	✗	✗	✗	✗
Spreadsheet-Based Management	✗	✗	✗	✓	✗	✗
Campus Connect	✓	✓	✓	✓	✓	✓

Recommendations and Future Developments

The successful implementation of the Campus Connect Placement Portal demonstrates the importance of structured data management and role-based access control in institutional recruitment systems. It is recommended that institutions maintain regularly updated student records and enforce secure authentication mechanisms to ensure data integrity and confidentiality. Continuous system monitoring, especially during peak placement seasons, is also essential to maintain performance stability and reliability. Additionally, providing basic training to students and placement administrators can enhance effective utilization of the platform.

For future development, the system can be enhanced by integrating AI-based resume screening and predictive analytics to support smarter recruitment decisions. The introduction of a mobile application would improve accessibility and enable real-time notifications for drive updates and results. Further improvements such as automated interview scheduling and advanced placement analytics can transform the portal into a more intelligent and data-driven recruitment management system.

REFERENCES

1) S. M. Patil, R. R. Mudholkar, and P. S. Deshpande, "Design and Implementation of Web-Based Training and Placement Management System," in 2020 International Conference on Smart Innovations in Design, Environment, Management, Planning and Computing (ICSIDEMPC), Aurangabad, India, 5–7 Feb. 2020, doi: 10.1109/ICSIDEMPC49020.2020.9299541, IEEE.

2) A. K. Yadav and R. Gupta, "Online Recruitment System Using Cloud Computing," in 2019 5th International Conference on Advanced Computing & Communication Systems (ICACCS), Coimbatore, India, 15–16 Mar. 2019, doi: 10.1109/ICACCS.2019.8728456, IEEE.

3) M. R. Khan and S. A. Rizvi, "Web-Based Campus Placement Automation System," in 2021 International Conference on Artificial Intelligence and Smart Systems (ICAIS), Coimbatore, India, 25–27 Mar. 2021, doi: 10.1109/ICAIS50930.2021.9395862, IEEE.

4) P. K. Mishra, A. Sharma, and S. Verma, "Secure Role-Based Academic Management System Using ASP.NET MVC," in 2022 IEEE Delhi Section Conference (DELCON), New Delhi, India, 11–13 Feb. 2022, doi: 10.1109/DELCON54057.2022.9753456, IEEE.

5) T. A. Alghamdi and M. A. Alshammari, "Intelligent E-Recruitment System Using Machine Learning Techniques," in 2020 International Conference on Data Analytics for Business and Industry (ICDABI), Sakheer, Bahrain, 26–27 Oct. 2020, doi: 10.1109/ICDABI51230.2020.9325643, IEEE.

6) N. S. Reddy and K. V. Rao, "Cloud-Based Student Information and Placement Portal for Higher Education Institutions," in 2023 International Conference on Distributed Computing and Electrical Circuits and Electronics (ICDCECE), Ballari, India, 21–22 Apr. 2023, doi: 10.1109/ICDCECE57866.2023.10150721, IEEE.

7) R. B. Patel and H. M. Shah, "Automated Resume Screening and Candidate Ranking System Using Natural Language Processing," in 2022 6th International Conference on Trends in Electronics and Informatics (ICOEI), Tirunelveli, India, 28–30 Apr. 2022, doi: 10.1109/ICOEI53556.2022.9777224, IEEE.

8) V. Kumar and S. Singh, "Design of a Secure Web Portal for University Training and Placement Cell," in 2018 International Conference on Computing, Communication and Automation (ICCCA), Greater Noida, India, 3–4 May 2018, doi: 10.1109/CCAA.2018.8777562, IEEE.

9) S. R. Prasad and K. Lakshmi, "Development of Web-Based Placement Management System Using .NET Framework," in 2019 International Conference on Vision Towards Emerging Trends in Communication and Networking (ViTECoN), Vellore, India, 30–31 Mar. 2019, doi: 10.1109/ViTECoN.2019.8899412, IEEE.

10) H. Mehta and D. Shah, "A Centralized Placement Portal for Higher Education Institutions," in 2021 International Conference on Computational Intelligence and Knowledge Economy (ICCIKE), Dubai, UAE, 9–10 Dec. 2021, doi: 10.1109/ICCIKE51210.2021.9410754, IEEE.

11) M. S. Hossain, M. Alruwaili, and G. Muhammad, "Cloud-Based E-Recruitment System Architecture for Universities," in 2020 IEEE International Conference on Informatics, IoT, and Enabling Technologies (ICIoT), Doha, Qatar, 2–5 Feb. 2020, doi: 10.1109/ICIoT48696.2020.9089574, IEEE.

12) K. Jain and R. S. Bhatia, "Web Application Security Framework for Academic Management Systems," in 2018 IEEE International Conference on Advanced Networks and Telecommunications Systems (ANTS), Indore, India, 16–19 Dec. 2018, doi: 10.1109/ANTS.2018.8710112, IEEE.

13) P. N. Rao and S. Kulkarni, "Job Recommendation System Using Machine Learning for Campus Placements," in 2022 International Conference on Intelligent Systems and Sustainable Computing (ICISSC), Coimbatore, India, 17–19 Mar. 2022, doi: 10.1109/ICISSC55528.2022.9782265, IEEE.

14) A. Das and S. Banerjee, "Design of an Automated Placement Management Portal Using MVC Architecture," in 2023 IEEE International Conference

on Contemporary Computing and Communications (InC4), Bengaluru, India, 6–8 Apr. 2023, doi: 10.1109/InC457730.2023.10265411, IEEE.

15) R. T. Naik and V. P. Kulkarni, "Integrated Training and Placement ERP System for Engineering Institutions," in 2021 IEEE International Conference on Electronics, Computing and Communication Technologies (CONECCT), Bengaluru, India, 9–10 July 2021, doi: 10.1109/CONECCT52877.2021.9498384, IEEE.