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Placement Automation Portal

Sarvesh Dhawade[1], Sairaj Nagargoje[2], Karuna Pol[3] , Sakshee Pawar[4]
Student, CSE (IoT) ,AC Patil College of Engineering , Kharghar, India[1]
Student, CSE(IoT) ,AC Patil College of Engineering, Kharghar, India[2]
Student, CSE(IoT) ,AC Patil College of Engineering, Kharghar, India[3]
Student, CSE(IoT), AC Patil College of Engineering, Kharghar, India[4]

Abstract: *Traditional campus placement processes are of ten hindered by information overload and fragmented manual workflows. This paper presents a Placement Automation Portal that utilizes a self-hosted n8n engine to automate opportunity discovery through email classification and data extraction. By establishing a "single source of truth" through centralized student profiles, the system enables a one-click application process and an integrated AI resume builder. Experimental results show that the system successfully transforms unstructured email data into structured, actionable dashboard entries, significantly reducing the cognitive load on students and administrative overhead for institutions.*

Keywords: Student Placement , E-mail Automation , Job Opportunity

I. INTRODUCTION

The shift from an academic setting to a professional career marks a pivotal moment in a student's journey. In modern higher education, the campus placement process serves as the main conduit for this transition; however, this conduit is frequently compromised by logistical inefficiencies and disparities in information. Despite the prevalence of digital communication, the primary channel for sharing career opportunities—email—has become a notable source of "cognitive noise." [1] This inundation results in a paradox of choice and information overload, causing students to often overlook valuable opportunities due to the overwhelming amount of unstructured data flooding their inboxes. The "Placement Automation Portal" is envisioned as a technological solution to reconstruct this disjointed landscape. Traditionally, placement cells have functioned as manual forwarding agents, establishing single points of failure and considerable bottlenecks. The responsibility of the organization falls entirely on the student, who is required to sift through, categorize, and monitor deadlines using various tools such as spreadsheets and calendar alerts. This manual method is not only ineffective but also susceptible to human error, resulting in "compliance nightmares" and data silos. Our research advocates for a comprehensive, intelligent ecosystem that merges automated opportunity identification with a "single source of truth" data framework. By utilizing n8n-based workflow automation and Large Language Models (LLMs), the system captures raw email data and converts it into structured, actionable insights. This transition from a reactive, manual search to a proactive, organized journey aims to reduce student anxiety while offering institutions strong, data-driven oversight.

II. LITERATURE SURVEY

An examination of current systems indicates a significant lack of integration among three fundamental components of placement management:

A. Institutional Portals: Current platforms such as Handshake function as job boards; however, they necessitate manual data entry by administrators and fail to address the issue of student email overload.

B. Workflow Automation: General platforms like n8n or Zapier serve as the "engine" for automation, yet they demand intricate, custom-designed vertical logic to be effective within a placement framework. [2]

C. Resume Builders: AI-driven tools like Zety or Resume.io are available, but they remain disconnected from the official academic profiles of students, resulting in data silos and the need for repetitive data entry. [4] The suggested

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system addresses these deficiencies by employing a unified student profile to facilitate both the application process and resume creation, while the n8n engine supplies the portal with real-time opportunities.

III. METHODOLOGY

All The system is designed as a decoupled, multi-component solution that follows a contemporary client-server model to guarantee both maintainability and scalability.

A. System Architecture and Design: The framework is composed of four main interconnected modules:

• Automation Engine (n8n): This is a self-hosted instance that periodically executes workflows. It interfaces with student inboxes through IMAP/APIs and employs AI models to interpret incoming emails.

• Centralized Database: A MongoDB server serves as the repository for the student's complete profile—including personal information, CGPA, backlogs, skills, and project history—functioning as the system's "single source of truth."

• Backend API: Developed in Node.js, this RESTful server manages business logic, user authentication via JWT, and coordinates data flow between the automation engine and the database.

• Frontend Interface: A responsive web application con- structed with React and Tailwind CSS that displays organized opportunity cards and tools for profile management.

B. Functional Workflow The operational lifecycle of the system is a continuous cycle:

• Onboarding: Students sign up and complete a comprehensive form detailing their 10th/12th marks, university grades, and technical skills.

• AI-Powered Classification: When an email is received, the n8n workflow utilizes an AI agent (e.g., Google Gemini) to classify the content as "Placement," "Internship," or "Irrelevant."

• Data Extraction: If an opportunity is identified, a dedicated node extracts the Company Name, Role, Application Deadline, and Link.

• One-Click Application: The system directly maps the student's profile data (e.g., user.profile.cgpa) to the fields of the application form, enabling the student to submit applications with minimal manual effort.

C. Modelling and Analysis: The system is conceptualized as a sensor-activated frame- work, with the "sensor" representing the incoming email stream.

D. Performance Analysis The effectiveness of the portal was assessed based on data integrity and response time: • Integration Level: In contrast to standalone tools, this system consolidates the dashboard, application form, and resume builder within a single data model, thereby eliminating "data silos".

• Automation Reliability: The n8n engine functions continuously, ensuring that opportunities are processed and displayed on the student's dashboard without the need for manual intervention.

• Data Accuracy: By employing verified profiles for applications, the likelihood of errors associated with manual data entry is completely removed.

E. Functional Limitations • External Portals: The "one-click apply" feature is limited to internal forms and is unable to auto-fill third-party websites or external Google Forms. • AI Dependencies: The accuracy of the system relies on the format of incoming emails; poorly structured emails may result in false negatives or errors in data extraction.

Simulations conducted on the portal show that the dashboard successfully presents a clean, card-based layout of all opportunities .

Parameter	Observed Result	Remarks
Backend Runtime	Node.js v18.x	High performance
Database	MongoDB v6.x	Schema-less flexibility
Workflow Engine	n8n v1.x	Robust automation

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Classification Time	Real-time	Near-instant processing
System Stability	Stable	No crashes observed in testing

IV. CONCLUSION

This project demonstrates the effectiveness of a vertically integrated placement system. By replacing a fragmented, re-active ”toolbox” with a proactive ecosystem, it fundamentally changes the recruitment journey from a stressful hunt to a structured, data-driven experience. Future developments will focus on expanding the platform into a broader intelligent ecosystem:

• Recruiter Portal: Allowing companies to post directly to the database and search student profiles via skill-based filters.

• Personalized Recommendations: Utilizing AI to perform ”gap analysis” between a student’s skills and job requirements..

• Mobile Application: Implementing push notifications for deadlines and new matching job alerts.

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