

Placement Guidance and Analytics System for Campus Recruitment

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Abstract— Getting ready for college placements is a nightmare. Students are constantly struggling because the information they need is everywhere but nowhere, the communication channels are backbreaking, and there is no reliable history of who recruited whom or how. The whole situation makes it nearly impossible to keep track of company news, figure out what the exams will actually be like, or make a solid study schedule. And students have to do all of that while still passing your regular college courses. When multiple companies start hiring at the same time, the confusion and stress just skyrocket. With respect to the problem defined authors have defined an user friendly platform to achieve the student preparedness before the placements. The defined tool innovatively steps up the overall placement game by giving students structured insights based on real data from past tests of students. Later, the platform's own evaluations have shown that students who used it were better organized, found resources much more easily, and felt better prepared for the actual exams. Results prove that the defined method is a reliable, workable, and scalable solution that helps everyone make better decisions, simplifies the placement process, and just makes the college entire recruitment effort more effective.

Index Terms— placement system, college recruitment, company tracking, student dashboard, analytics, notifications, past year questions, data management.

I. INTRODUCTION

Placement processes are incredibly important for shaping a student's entire career path, especially at institutions where lots of companies visit for recruiting every year, as the job market [1] is so competitive now, students absolutely must be sharp, up-to-date, and fully know the expected hiring patterns, exam structures, and skill requirements. The issue is that many colleges are still running on old-school placement systems, where information is all over the place, communication is a mess, and there are no centralized resources for preparation.

The constant struggle often keeps students from being fully ready and sadly, causes them to miss out on opportunities during the drives. Implementing a placement guidance system that combines study materials, specific company profiles, and past hiring data can really boost the student achievement [2]. Similarly, when students deal with a large number of student bodies and different companies need a data-driven system which gives more accurate guidance than trying all the possibilities manually [3] [4] and [5].

In recent days when students start preparing for big companies like Infosys, TCS, Cognizant, or Nutanix they often rely on fragmented sources, scattered, social media applications, think of random PDFs and just ask their friends. Suppose, certain students have observed that students score higher when they are guided with actual real time questions sets rather than certain materials compiled at random. Hence, it is crucial to have well organized and categorized repositories to develop the competitive skills in the students systematically.

Additionally, a major issue with typical placement processes is lack of communication. Institutes frequently depend on unauthorised channels for communication, which fails to reach the students reliably. Previous studies have shown that using an authenticated automated system for notifying the students or broadcasting the updates such as test schedules, eligibility rules, and shortlist announcements would reduce confusion and establish proper communication channels among students [5]. In order to prepare a placement aid for students assessing their progress and identifying their ability gaps with analytical insights are an essential component of digitized placement preparation. Predominantly, placement patterns vary from one college to another as companies decide the hiring patterns with expected skills from the students and previously hired strategies. Summarisingly, the proven methods have shown the path for developing an optimized platform for placement preparation and guidance for the students with more accurate and broader datasets.

The proposed paper develops a friendly platform to assist the undergraduate students to take up preplacement guidance and self assessment for their upcoming placement companies at their institute. Specifically the platform gathers scattered and unstructured study materials and organizes them in a structured way to provide the student with more precise and non-replicable data before the placement drive from the company. By aggregating all the essential materials such as previous scenarios, company details and real time challenges into one platform, the system motivated the students to prepare in a much better and organized manner. Additionally, the platform focuses on institute specific placement trends making the way for students to prepare in a more accurate way. Major contributions of the proposed work incorporates the students' dashboards, classified previous year challenges from repositories, company specific information materials and automatic notification methods in a single platform. Furthermore, the defined method also increases the student readiness, decreases the dependability on unauthorized communication channels and finally improves the overall efficiency of institution placements by offering refined study resources, centralized access to placement information and timely updates.

II. LITERATURE REVIEW

Looking back ten years ago the digital tools used for college placements were not advanced. The system was only designed mainly for the placement officer to get information about the company details and eligibility criteria. The students were facing lot of issues in accessing basic information about the company. From a student's point of view this platform centralizes everything and helps students to get basic information. So this will help students to get information directly by bypassing the placement officer. As pointed out by Romero et al. [6], they observed that early systems were only useful for the placement officers, so they offered limited support to the student in terms of learning and preparing for the test. As the competition in the job market increased, there was a major shift in the platform in which the students were using such as resume-building tools etc, but still there was a huge gap between what the company was actually expecting and what the students were doing. Students were still facing a lot of difficulties to crack the interview. Cortez et. al[2] demonstrated that student performance will significantly increase when they practice in the real world assessment patterns rather than relying on just information about the company.

The importance of having structured access to the previous year question and the recruitment trends. Kabakchieva et. al [7] observed that students will perform significantly well when they have already practiced the previous year assessment question. There is a pattern followed by the companies such as Infosys, TCS, Cognizant, Nutanix etc, where similar types of questions are asked in the assessment. In many colleges this data is present but it contains duplicates and outdated materials. Kotsiantis et. al[8] highlighted the need for a centralized and well structured database that classifies questions based on topic and allows students to prepare more effectively. One of the major challenges in recent studies is the lack of a standardized real time communication system. Many colleges still depend on informal channels like whatsapp and word of mouth communication, which often lead to confusion and there is a high chance that the student may miss the important information. Pandey et. al[9] showed that adopting automated notification systems significantly improves communication by instantly sharing messages about the company, making the overall placement process more efficient and student friendly. Recent research has examined how data analytics can enhance student performance. Ramesh et. al[10] highlighted that the tools such as performance tracker and skill monitor platform helps students identify the areas where students are strong and well versed and also the areas where students

should focus on. But many existing platforms remain limited in scope. Musso et. al[11] argued that meaningful personalization can increase the academic performance, behavioral patterns and technical competencies. The use of data provides students a clear understanding of their readiness for recruitment

In the current placement preparation system the tools available for individual tasks such as aptitude testing , coding testing and accessing company information. Cortez and Silva[2],through their study using UCI[13] dataset, they demonstrated that integrated in all in one platform help student to get the better outcome than the using isolated platform, Tripathi et. al [12] observed that the student performance and skill drastically increased when they refer the integrated platform rather than the isolated one. In the current landscape most existing platforms fall to account the unique recruitment characteristics of individual institutions. Each college has their own recruitment history with certain companies regularly visiting. The proposed system integrates company information, previously asked questions , real time notification and the reviews about the company which is given to the student who is actually placed in the company . The centralized approach ensures that students receive accurate , relevant and timely guidance from a single platform. The platform helps students to make better decisions and prepare more effectively for the recruitment process.

From the reviewed literature, it is observed that most existing placement mentoring models focus on isolated functionalities such as company information portals, resume-building tools, aptitude practice platforms, or notification mechanisms. While these improve specific aspects of placement preparation, existing models do not have an institute specific system that aligns previous year data, structured preparation resources, and real-time notifications within a single system. Our project adds to existing solutions by adding company wise questions, categorized material and notification services into a unified platform. Proposed institution centric design helps address the gaps identified in previous studies and provides a more student focused placement guidance system.

III. METHODOLOGY

A structured process is employed to model the defined placement guidance system. The defined model initially collects the data and is preprocessed later the system design is formulated for implementation and evaluation process. The main objective of the article is to create a platform that helps the students to access all of the pre-placement information, company profiles, previous year challenges and to prepare for the placement drives.

A. Research Design and Approach

The article precisely employs a development approach rather than a theoretical approach with the goal to deliver a functional system for colleges. The method involves a data-driven approach throughout the process to implement the defined objective. As it involves collecting placement data, getting all of the previous year questions and storing them in an organised database while helping students visualize the database which in turn helps in keeping transparency and allow evaluation based on the real data sets.

B. Data Collection and Sources

Existing studies used the raw data by which many duplicate entries were created which led to inconsistencies and missing fields in the data collection process. Addressing this issue, the proposed methods aim to remove duplicate entries using key matching and basic validation, format the data and categorize the placement-related information based on companies and job roles. Ensuring the data accuracy and reliability while searching against the defined platform.

C. System Architecture and Module Design

A structured database in the backend is used to manage storage, process and retrieve the data. The systematic procedure to maintain efficiency is as follows:

- Company Information Module
- Student Profile Management Module
- Past Year Questions (PYQ) Repository Module
- Dashboard and Analytics Module
- Notification and Alert Module
- Search and Filter Module
- Admin and Data Management Module

D. Authentication

The proposed placement guidance model is enabled with the user verification modules to enable the secured services. The process of authentication is shown in the below Fig. 1 and it depicts the image representing a

flowchart for explaining the process of secure login and access control to a system. It starts with a Start node, followed by a stage for Login and Registration with the headline Secure Login, symbolically representing a lock to show the protection and security of data. Once the login details are submitted, the system proceeds to an Authenticate User decision point, where verification of the user credentials takes place; if authentication fails, directly leading to Deny Access, entrance into the system is barred. In case authentication has been successful, the flow proceeds to check whether the user is authorised, and the necessary permissions or roles of the authenticated user are checked. In case the user becomes authorized, the system proceeds to Grant Access, in which the user gets their access to use the application or resources.

E. Notification

A notification based system is designed to receive the updates on the things happening with respect to placement preparation or placement drives . The Fig.2 illustration shows that upcoming company notification process in the Placement Guidance System, demonstrating how the system automatically notifies the students of the upcoming visits by companies to the campuses for placements. The Process involves the daily automatic operation of the scheduled task to allow the system to access the database of the companies to check the list of companies visiting in the next month. In the event that no companies exist in the database, the process terminates with immediate effect; otherwise, it continues to extract the email addresses of the users who are the students in this case. Thereafter, it structures an email message with all the important details such as the company names and the dates of visits, and finally transmits them through the use of the SMTP notification service, marking the termination of the process to remind the students of the upcoming placement opportunities. Flow diagram for the notification module is defined in Fig. 2 as follows:

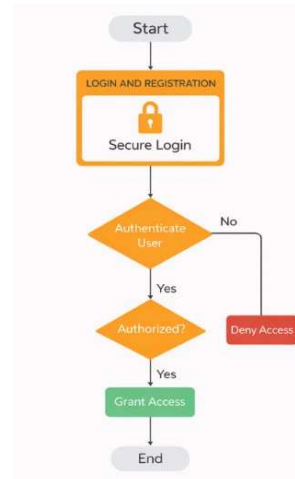


Fig. 1. Flowchart of Authentication

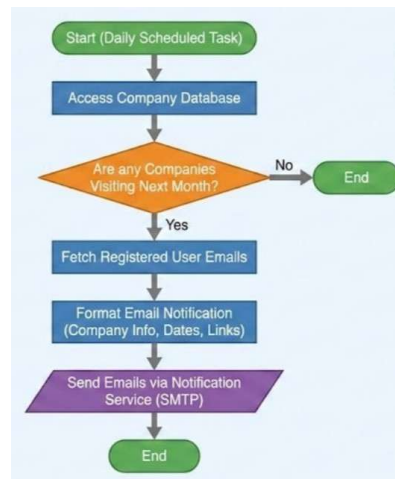


Fig.2 Flow of Notification Modules

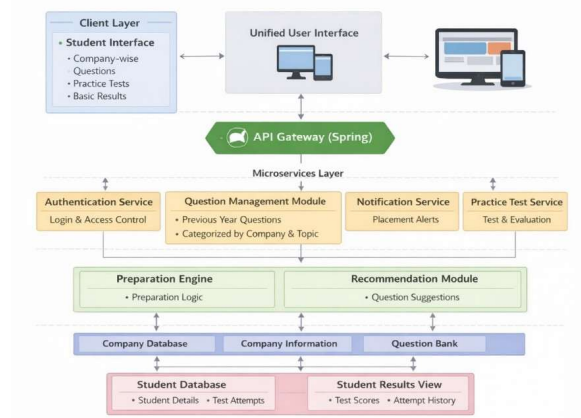


Fig. 3. Microservice Architecture

G. System Workflow

The workflow of the defined method is illustrated in Fig.4 which depicts the data flow between users and system components along with the outputs. The figure highlights the entire flow of online coding and evaluation system operations, from the user interaction process to displaying the result: the flow starts when the user opens the coding page (UI), produces or modifies code, chooses the programming languages like Java, C, or C++, and submits the solution, which goes to the backend server (REST API developed in Spring Boot); the system validates the inputs based on language, security, and syntax verification, retrieves corresponding test cases (hidden and public), and proceeds with compilation, and in case of compilation failure, an error message is shown to the user, and the process terminates, but in case of success, the code is separately executed for each test case after applying constraints, the code output is compared for correctness between the expected output and the actual output, and the corresponding test case is declared pass or fail in case of passing all test cases, a success message is generated, but in case of failure, corresponding partial or failed test case output is generated, and thereafter, the system deploys the final output to the front-end part and displays detailed output information in the UI page, and then terminates the process.

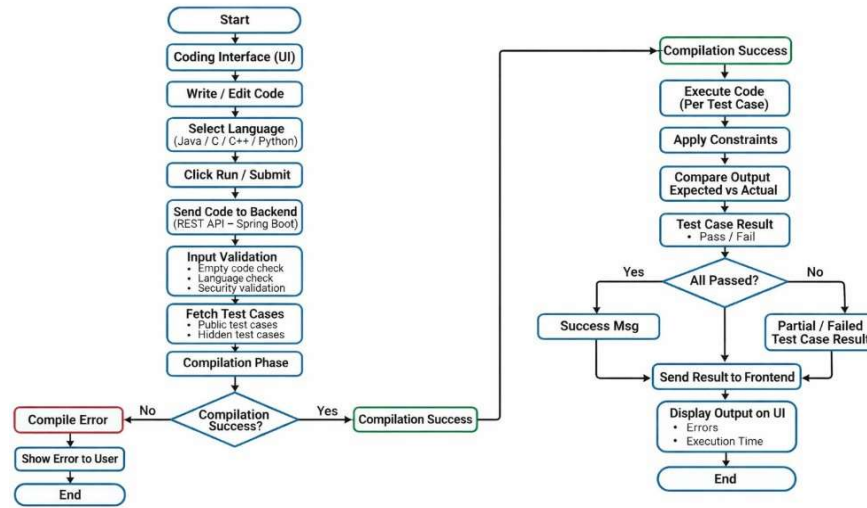


Fig. 4. FLOW of the Proposed Model

The effectiveness of the system is evaluated based on feedback from the students and tracking the frequency of notifications. Students also have revealed that our project has motivated them in real time academic challenges, as it employs a rule based filtering system.

IV. RESULTS

The model is compiled and the main dashboard is shown in Fig.5 . The system is designed for different companies such as LTI Mindtree, Finacle , Infosys, Cognizant, Oracle, and DevRev. Based on the company, users can access the test cases , previous year challenges and essential materials. The below image Fig.6 displays detailed information about the company Finacle, and it shows the general description of the company. It describes the platform's features and architecture. Below the description, there are links to programming problems, which are basically the past year exam questions.



Fig. 5. Dashboard

The below image Fig.6 displays detailed information about the company Finacle, and it shows the general description of the company. It describes the platform's features and architecture. Below the description, there are links to programming problems, which are basically the previous year exam questions. Fig.7 and Fig.8 give the sample question scenario of Finacle Company and Coding Interface for the same respectively.

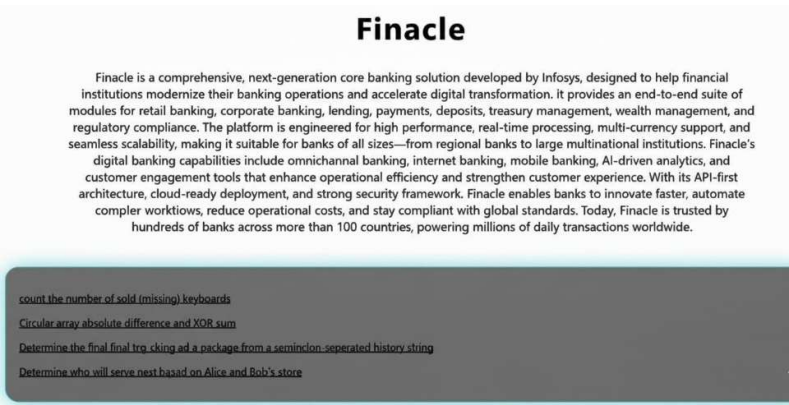


Fig. 6. Finacle Detail Page

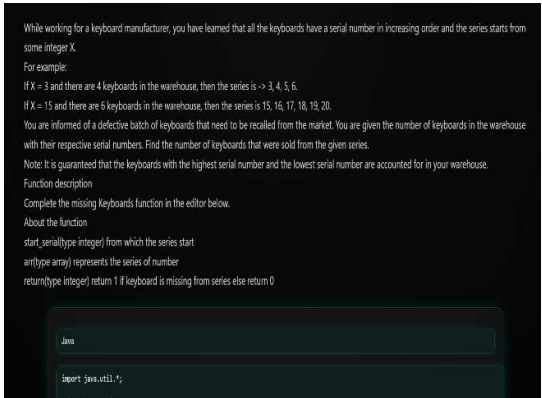


Fig. 7. Example Test Case for Finacle Company

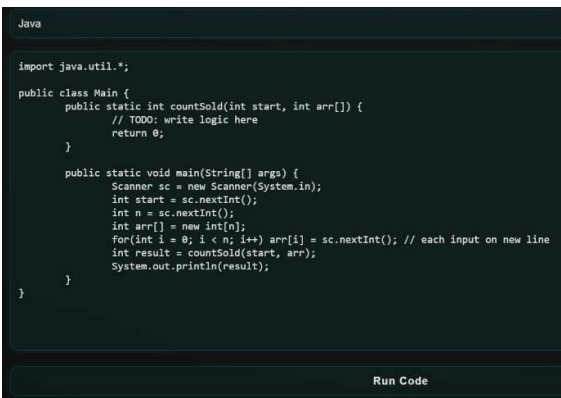


Fig. 8. Coding Interface

V. CONCLUSION

The Placement guidance platform gave best performance with highest accuracy which enhanced the effectiveness of the defined system. Also, the given model aimed at giving better services for the students by identifying the necessary factors that could affect placement outcomes. This can also be adopted by colleges to understand the patterns in placements and improve the training programme. Future improvements can be expanding the dataset to add more company details, adding more features such as extracurricular activities by using deep-learning models.

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