Placement Automation System For Educational Institutes

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Abstract: Training and placement (TNP) are critical components of every educational establishment, where most of the work is done manually. Paper-based methods, databases, spreadsheets, and e-mail exchanges help to handle TNP activities. With paper and spreadsheet-based methods, it is difficult to manage the data and applications of all the students for every company in placement activity. In the traditional approach, the placement coordinators create forms and need to circulate them among the students to get applications. The application process for a company involves filling out student details forms which are repetitive as most details are static. The students face difficulty while tracking and managing all the applications they have made to various companies with a traditional spreadsheet-based approach. With the traditional approach, it is difficult for students to prepare for placement drives with vast content. The goal of the proposed work is to automate TNP activity. The main benefit of this proposed work is that it only requires a single registration. The proposed work will help the students in managing the applications. The chatbot is one of this system's essential components. This AI-assisted chatbot can help students with placement-related questions. In order to respond to and process the questions, this chatbot employs NLP and different ML models. The proposed work will provide a job posting facility that is much easier to work with. Filtering of students as per the company's eligibility criteria would also be achieved. Recommendations are made using the proposed work for the preparation of placement drives. Also, all the placed students can be tracked in a single place and statistics can be derived from the data of placed students.

Index Terms - **Automation, Artificial Intelligence, Chatbot, Machine Learning, NLP.**

I. INTRODUCTION

The use of the internet and computers in the market has observed drastic evolution thereby increasing their daily usage and the evolution of the automated application. The advantages of automated applications are reaching pinnacles thereby motivating the market to automate their manual processes. This is the motive to automate the placement activity with the aim to reduce the complexities and drastically reducing errors in processes involving huge databases. moreover, it also helps in the easy updating of these large databases. Presently, the TNP cell relies on traditional systems involving paperwork and manpower or automated systems that are used by TNP of educational Institutes are performing the task of job posting, job application, and job tracking. These existing systems lack in providing other functionalities for making the TNP process easy and faster. Thus, maintaining the database and thereby analyzing it for future reference makes it a tedious task when it needs to be done manually. To overcome these issues the proposed system creates a web-based application.

The traditional placement approach slows down operations and creates problems like inconsistent and ambiguous operational procedures. Students can utilize this application to find solutions to their placement-related questions. The suggested solution strives for user-friendly operations using a web application that can manage uncertainty. It also makes it easier to gather and maintain important data on the students. As a result, the paperless placement process can be carried out effectively and accurately. An additional advantage is the capability of straightforward placement operations analysis. Our application's advantages include less reliance on human error, careful management of data, and quick execution.

With this application, students will get recommended topics for preparation

for a particular company's interview process from the past experiences of students from previous batches. In addition to this, the application also provides security and authentication to avoid unidentified or unauthorized changes in the application portal.

The applications allow a set of functionalities to the different sets of users thereby making it highly reliable and protected from undesired malpractices. It also acts as a helpful tool for the Placement coordination team to filter and perform analysis of the enrolled students for the recruitment drive. Therefore, the aim of the proposed work is to build a highly reliable web-based application with efficient market viability for different kinds of institutions. The major contribution of this work is to automate end to end TNP process by implementing functionality for job posting, job application, tracking job applications, scheduling placement activities, statistics, query solving, and recommendation of important topics.

II. LITERATURE SURVEY

Any educational institution's Training and Placement Cell, where the majority of the work is currently done manually, is an essential component. The placement officers can use the web-based application to offer company information [1]. There will be communication sent to the pupils. A list of pupils who have been placed will be uploaded into the application by the administrator after the hiring process is finished. The student can submit a request to the placement officer if any modifications to their information are required. The system can be accessed using their modern smartphone as an Android application, and the high-authorized person (PO, Principal, etc.) can access it through an application with a valid login provided. The Training and Placement Officer (TPO) of the statute may use this system [2] as a tool to manage student data pertaining to arrangements and to perform position actions. Students checking in should be able to transmit their information in the form of a CV, Personal subtitle elements, and Academic facts. The system will enable the submission of resumes, notifies the student body of available positions, and manages the relationship that results in invitations to placements and other events [3]. The Integrated Toolkit for Reach-out to Companies Track is one of its features.[4] will replace the manual processing of the office which makes the machine slow and results in problems such as inconsistency and ambiguity in operations. The proposed system intends user-friendly operations which may resolve ambiguity and achieve certainty.

The system in [5] explains how Users can manage their information through OPUS, suppliers can promote their openings, employers can post openings, students can apply for any positions, and placements coordinators can control all aspects. Everything is accessible at any time and from any location because it is all online. This paper [6] discusses the technical proposal of the VALS project and the Semester of Code program to support managing virtual placements in companies related to Open-Source development. Students can get solutions to their questions from placed seniors and faculty. The pupil will learn about the interview experiences of the seniors. and senior person who is already an expert in the field of interest in which they have a query [7]. Placement probability can be calculated using SVM and K-means classification methods, although it does not give a continuous number for placement probability [8]. Along with the comprehensive firm information, a requested list of candidates can be delivered to hire the students based on provided eligibility criteria. Any information posted by the students may also be searched by the administrator logging in. The administrator can view user information and validate it. They can also create a student list based on company criteria, give users company details, do searching and sorting, and create reports [9]. The system becomes automated during online user registration, activation and deactivation, personalization, online resource provision, user communication, online feedback, and other setup options [10]. The input from the system is more precise. Accessible precise data is available. It increases the dependability of systems and software by assuring security [11]. The primary goals of this system are to notify the students about upcoming training opportunities and to give them adequate information about the training experiences and evaluations of past students. As a methodology, the Agile Dynamic Systems Development Method was employed in [12]. The notification feature can be provided to students to get notified of new jobs and schedules [13].

Using XML-based AIML approach intents can be mapped to responses for normal conversations [14]. Use of recurrent neural networks (RNN), deep learning, and convolutional neural networks to train emotion classification models from a large amount of labeled data. The use of Natural Language Processing (NLP) and Natural language generation (NLG) to interpret user interactions is crucial in counseling [15]. A voice-recognition chatbot can be created When a question is not comprehended by the bot, it is further processed using a third party's expert system. Web bots are designed as text-based web companions to amuse users. They focused on a better system in this case if the application is voice-based in addition to text-based. A SOAP-based black box server is can be used. The system keeps the knowledge database it needs to recognize the text and choose how to respond to the query. The input sentence will receive a bigram similarity score for input sentences. RDBMS is where the chatbot's knowledge is kept [16].

The chatbot's answer pattern is saved and it recognizes the sentence order via pattern comparison [17]. The database response is chosen at random using the random() function after the input has been obtained using the text() function and any extra punctuation have been deleted using the trim() function. The chatbot serves an amusing function. The words can be extracted from the phrases using the n-gram approach [19].

Recent research of other placement management systems mostly consists of gathering the student data and then applying the constraint on collected data to filter out the students according to eligibility. All the proposed system comes with single-time data collection of students during registration. All the existing systems don't provide any means to authorize the student, any student is allowed to register and put their data, which may be illegitimate. For the existing chatbot system comparing the user's input to predetermined queries, results that are pertinent to that specific inquiry are returned. The bot won't be able to respond as a result if the question isn't the same as any of the pre-defined queries. The query must be thorough and include all pertinent terms in order to have an effective conversation; otherwise, there may be no response. Existing systems lack the feature of a schedule of placement activities due to this student will not be able to get the schedule of activities planned for the day, week, and month wise. The existing system has an application process in which users have to apply and fill in personal and academic information repetitively. The existing system mainly focuses on the student while ignoring the TPOs and coordinators this system doesn't provide any feature for analysis of placement for past years or months. So neither students nor TPOs will be able to analyze the number of placements.

III. PROPOSED SYSTEM

The majority of placement offices in educational institutions currently employ a method that involves paperwork, emails sent from one authority to another for communication, or WhatsApp-like social media for placement-related updates. However, using this method will waste time and cannot guarantee the accuracy and consistency of the process. So we proposed a system as shown in Fig [1] where all these problems can be handled. This proposed system has two interfaces provided for students and administrators
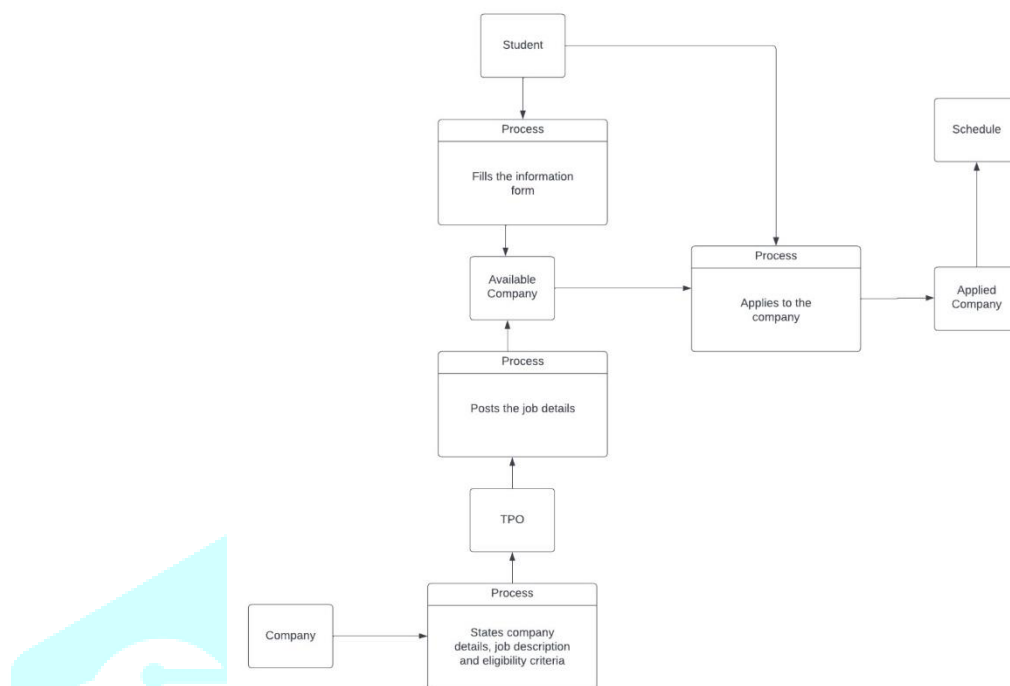

Fig1: System Workflow

So, on the admin side, the functionality is provided for adding the job opening to the system. After admins add a job opening this job will be visible to students on the student side. Admin will also be able to edit these job details. The system provides a feature to add schedules of company drives, interviews, and presentations using the schedule tab of the system. To analyze the current placement status and placement statistics the functionality is provided for admin in the system according to various criteria like a branch, year, month, etc. The proposed system consists of a query solver for students where students will be able to add their dynamic queries from their side. These queries will be visible to admin on their side and admin will solve those queries according to the status of the query solved, pending, in process, it will drag and drop to its respective category like kanban board. Admin will be able to add the placed students to the list after adding students to the placed list student will not be able to apply for jobs further.

IV. SYSTEM OVERVIEW

As shown in Fig [2] The student and coordinator login into the application using their respective credentials. Once logged in to the application, they both will be presented with a dashboard where all the functionalities will be displayed. This will be the front end of the application which is responsible for showing the information in a browser that is easy to understand. The frontend talks with the server through API calls and HTTP requests. All the data from the user goes from the front end to the server. The server talks with the database. The server stores the data in the database for different functions like job posting, student applications, etc. The server fetches data from the database and based on this schedule and statistics can be displayed to users on the front end. The functional modules of the proposed work are as follows-
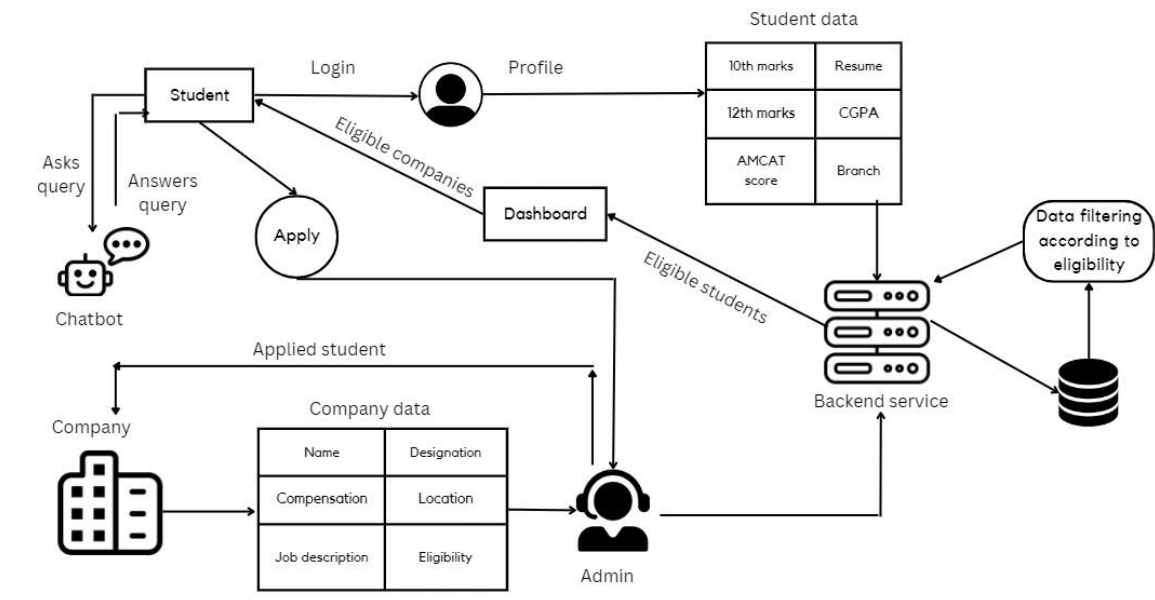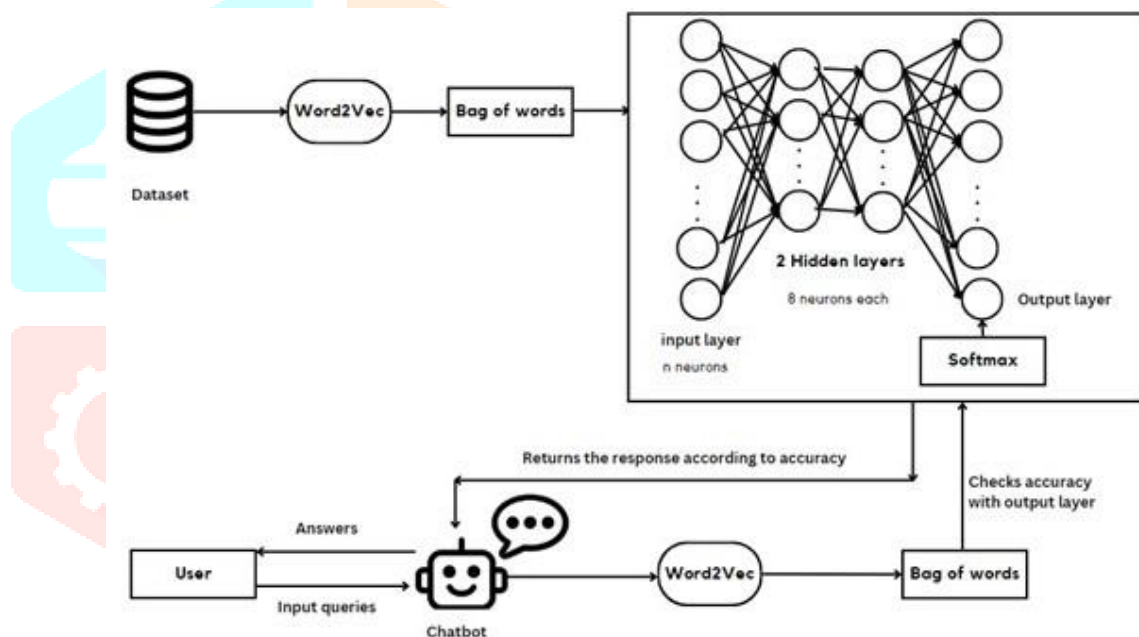
Fig 2: System Overview

Fig 3: Chatbot Architecture

User as Student:

1. **Login**: The students should be able to login using their respective credentials.
2. **Registration**: The student should be able to add his/her respective educational details required for eligibility.
3. **Schedule Timetable**: The student will be able to see the timetable and scheduled companies.
4. **Upcoming Companies**: The student should be able to see all the upcoming companies and will be able to apply if eligible.
5. **Applied companies**: The student will be able to see all the companies he/she has applied. This will help in the management and tracking of different applications.
6. **Application**: With only one click, students can submit applications for employment for which they are qualified.
7. **Query solving**: The AI-assisted chatbot will help students get answered their queries related to placement activity.
8. **Statistics**: The student will be able to see all the statistics of all the companies visited and statistics like the highest, average package per department.

Coordinator as Admin:

1. **Login**: The admin should be able to log in using their respective credentials.
2. **Job Posting**: The Admin should be able to add job and role offered for the particular job. This added job will be visible on student's side.
3. **Job Details Modification**: The administrator will have the ability to change the posted job's job specifications.
4. **Add placed student**: The admin will be able to add placed student details to the system.
5. **Student Details Modification**: The admin will have the ability to change the student's details.

6. **Statistics**: The statistics will be displayed once the admin does the entry for which students have been placed in which companies.

V. Results

All of the manual tasks performed by the training and placement cell of educational institutions and students have been automated as a result of the proposed work. Both students and administrators gained time thanks to process automation. Administrators may publish jobs, amend job details, authenticate students, and address their questions with ease by using the suggested work. The recommendation module based on content-based filtering achieved an accuracy of 82 percent using parameters like skills, experience, interest, education, etc. Also, the proposed work successfully suggested topics to cover for preparation and training purposes with an accuracy of 90 percent. Additionally, students can simply apply for jobs, track their applications, submit questions, access schedules, and view placement statistics.

VI. CONCLUSION AND FUTURE SCOPE

In this proposed work, we propose a solution to effectively automate the placement activity using a web application that will be used both by the placement coordinators and the students. The coordinators will use this application to create company job postings, manage all the student applications, filtering of students based on eligibility criteria, and maintain and store all the placement details in a single place. The students will find this application helpful as it simplifies the application process and makes it easy to manage and track all the active and past applications, a better understanding of the schedule of upcoming companies, easy query solving using a chatbot, and statistics that provide the gist of the placement activity.

Even though this portal offers an automated system for managing educational institution placement activities there is a need for improvement. We can add a component to our automatic placement system that will allow us to collect information from the placed student regarding interviews, questionnaires, and topics covered during the recruiting process. Important topics for the unplaced students can be recommended by examining the data supplied by the placed students.

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