Gowthaman J, 2025, 13:2
ISSN (Online): 2348-4098
ISSN (Print): 2395-4752

International Journal of Science, Engineering and Technology

An Open Access Journal

Campus Recruitment Management System

Gowthaman J, Professor Dr R. Priya Anand
Department of Computer Application – PG, VISTAS

Abstract- The availability of information and the facility for the user to take action on the information collected have been revolutionized by the use of the Internet and the World Wide Web. The placement process can be managed using the internet which arises a need to develop a web-based placement management system specifically by the recruiters and the software engineers that can be used as a Recruitment system (Online TnP portal). This system can be used as an application for both candidates and recruiters. Advanced features for recruiters are available as they can shortlist candidates for further rounds according to their requirements on the basis of the probability obtained. The current recruitment system recruiters do not possess candidate information apart from his/her CV. This proposed system aims to analyze the candidate performance and recommend candidates fittest for the job using Random Forest Regressor algorithm that will help to maximize the placement probability of candidates easing the recruiter's task. Random Forest builds multiple decision trees and merges them together to get a more accurate and stable prediction. This system will provide ease and efficiency in recruitment process.

Keywords- Campus recruitment, Online recruitment, Web application, Applicant tracking system, Resume filtering, Human resource management, Data security, Cloud computing.

I. INTRODUCTION

The organizations face difficulties in hiring students during the placement drives. The earlier system done manually by training and placements department makes the process slow and leads to inconsistencies and ambiguities. In addition, it is very difficult to maintain coordination between students and companies. Recruitment system is an online application for organization as well as company usage. To manage the student information regarding placements, the college Training and Placement Officer (TPO) can use this application.

It can be used as tool to analyze candidate's performance and predict his placement probability prior to the placement sessions. Online training and placement portals are available that allow filtering, resume building. But they don't have any tool for candidate's performance analysis.

And do not provide us with any placement probability. Classification algorithms like K-means and SVM have been implemented earlier but fails to provide a continuous value for placement probability. Also, data mining techniques implement classification generating a discrete value and hence fail to provide accurate probability Fuzzy logic and KNN algorithm have been used for prediction but these provide answers which are frequent and closest to the query. The proposed system provides the facility of maintaining the details of the students and gets the requested list of candidates for the company who would like to recruit the students based on given skill. The aim of our project is to reduce maximum chances of errors in the manual work and save time as well as to make the students aware of their strengths and weaknesses for better placement opportunities. Hence, this Recruitment system finds scope in increasing the efficiency of prediction.

Background

"Random Forest is a model which divides the dataset into various subsets and builds decision trees on their basis. Then uses the average of the subsets to improve the prediction accuracy."

III. PROPOSED SYSTEM

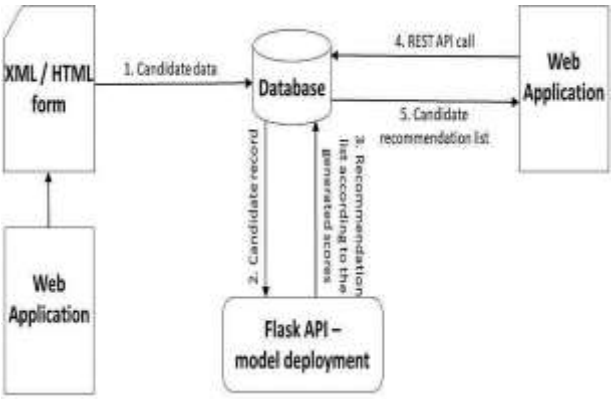
The proposed system is a Web application meant to be used for recruitment process. It can be used by organizations as a tool for effective recruitment by analyzing the candidate's fitness for the job. And colleges can use the system to get an idea about the probability of the student to be placed prior to the placement drive with the help of Placement prediction feature. This system recommends the candidates on the basis of their likelihood to get placed. It considers parameters like candidate's SSC marks, HSC marks, CGPA, gender to predict the placement probability. Machine learning technique is used to implement Random Forest Regressor algorithm. The model is first trained on a dataset of any previous placement drives and then used to predict the probability of the candidate to get placed. The system consists of two phases –

- Real-time placement prediction system(dynamic) Proceedings of the International Conference on Artificial Intelligence and Smart Systems.
- Probable candidate list generator(static).
- This phase is for walk-in candidates where no previous record of him is available in the system.
- Step1: Placement candidate enters required credentials.
- Step2: These input parameters will be passed to the Flask API using REST API call.
- Step3: The data forwarded by API will be given to trained ML model for calculation of placement probability.
- Step4: This placement probability will be displayed on the web page back through Flask API and the candidate record will be saved in a csv file.

Prediction Process in both phases:

A pickle file is created, in which scikit-learn is imported which is a Machine Learning module. Using scikit-learn, Random Forest Regress or algorithm is trained on a dataset which contains historic data of placement drive.

Now this pickle file is read by the Flask API file and the trained model is fitted on the current candidate records.



- Step1: HTML/XML form is filled by candidate to store data in database using browser.
- Step2: Flask API is used to implement ML algorithms on database data.
- Step3: A trained ML model is implemented on the candidate records and scores are generated.
- Step4: A candidate recommendation list is generated based on the scores.
- Step5: Whenever a placement client requests the list, it will be retrieved from database and displayed on the web page.

Real Time Placement Prediction

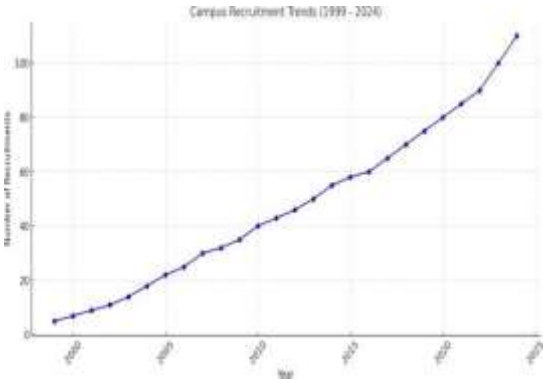
The parameters required for dynamic Prediction is the Name, SSC percentage, HSC, Percentage, CGPA, gender (1- Male and 0- Female) and algorithm used i.e. Random Forest Algorithm. Based on these the placement probability is generated. Mostly companies recruit maintaining the 1:1 ratio of males and females hence gender would be useful for company recruiters.

The parameters, department and skills are used to sort the candidate data in database.

Advantages

- **Automation**: Reduces manual work and increases efficiency.
- **Centralized Access:** All stakeholders access one platform.
- **Real-Time Updates:** Instant notifications about job openings and results.
- **Analytics**: Helps track placement metrics and student performance.
- **Security**: Role-based access ensures data integrity.

V. CRMS GRAPH



Trends From 1999 To 2024

1999 – 2004: Initial Adoption Phase

- **1999-2001:** Recruitment numbers were very low (~5–9 per year). Many institutions still relied on traditional notice boards and manual application processes.
- **2002-2004:** Slight growth as IT companies began mass recruitment in India. Basic computerization started in top-tier colleges.

2005 – 2010: Digitization Begins

- **2005-2007:** Recruitment saw steady growth (around 20–30/year). Colleges started using spreadsheets and email- based coordination.
- **2008-2010:** The global financial crisis slightly slowed down the growth but overall recruitment processes began integrating more structured databases.

2011 – 2015: Transition to Online Systems

- **2011-2013:** Cloud-based solutions and student portals started emerging. Institutions implemented ERP systems.
- **2014-2015**: Significant increase (~50– 55 recruitments/year). Campus placement cells adopted web-based job posting and application platforms.

2016 – 2020: Automation & Growth

- **2016-2018:** Rapid rise due to automation tools like AI-based filtering and scheduling. Many universities adopted dedicated Campus Recruitment Management Systems.
- **2019-2020**: Pre-pandemic peak (~80 recruitments/year). Companies widely used campus hiring to secure fresh talent.

2020 – 2021: Pandemic Impact

- **2020**: Virtual interviews and remote onboarding emerged. Although the pandemic disrupted in-person drives, the use of digital platforms soared.
- **2021**: Recovery phase with hybrid recruitment methods and a renewed focus on digital systems.

2022 – 2024: Post-Pandemic Acceleration

- **2022-2024:** The most significant growth (up to 110 recruitments/year). CRMS became a norm, with integrations for:
- Online assessments
- Video interviews
- Resume parsing and analytics
- Companies now rely on CRMS for end-to-end talent acquisition.

VI. TYPES OF TESTING PERFORMED

Unit Testing

Each module (student registration, login, job posting, etc.) was tested independently.

• **Tools Used:** PyTest / PHPUnit / Postman (for API testing)

• **Example**: Checking if the student registration form validates missing fields.

Integration Testing

Tested the interaction between modules, such as:

- Student login → Apply to job → Admin sees application.
- Recruiter posting a job → Students viewing the post.

System Testing

- The entire CRMS was deployed and tested as a complete system.
- Tested on different browsers (Chrome, Firefox, Edge).

VII. CONCLUSION

	NAME	TENTH	TWELTH	CGPA	GENDER	DEPARTMENT	SKILLS	PLACEMENT_PROBABILITY
0	ANUSHKA SHETTY	88.00	75.00	8.10	0	IT	C	1.00
1	SANJAN PARAB	78.00	77.00	8.00	0	IT	C, Java, HTML	1.00
2	URMILA DOSHI	86.50	84.20	7.29	0	IT	C, C++, Java	1.00
3	Yuvraj Haryan	91.00	83.90	9.28	1	IT	Python, Java, C, ML	0.88
4	JHONY DSOUZA	98.00	68.00	9.50	1	IT	Python, C, HTML, CSS	0.88
5	PREMA MISHRA	87.00	81.00	9.01	0	IT	C, C++, Java	0.83
6	GANPATI RAMAN	76.50	97.70	9.30	1	IT	Python, Java, C, C++	0.87
7	[illegible]	90.00	81.85	9.00	1	IT	Python, C, ML	0.47
8	PUNARNAVI	65.00	58.00	7.63	0	IT	Java, C	0.39
9	[illegible]	78.00	75.00	5.80	0	IT	UI/UX, C, Java	0.70
10	SAMRUDDHI PATIL	68.70	47.00	7.20	0	IT	C, Python	0.66
11	JOBIN JOHNSON	79.33	78.33	8.00	1	IT	C, C++, HTML, CSS	0.60
12	ARJUN SILVA	66.00	82.00	8.80	1	IT	ML, Python, C	0.37
13	DURAI	88.00	77.00	8.30	1	IT	C, Python, ML, SQL, PHP	0.31
14	PANDIYAN	78.00	83.20	7.50	1	IT	React, CSS, JavaScript	0.26
15	SANKET WANI	82.00	87.00	6.80	1	IT	C, Python, AngularJS, HTML	0.25
16	MODI	68.00	75.00	8.30	1	IT	ML, Python, C	0.20
17	SIDDHESH NAIK	84.20	73.40	8.00	1	IT	C, Java, Python, HTML	0.15
18	RAJ HEDAU	64.00	80.00	9.20	1	IT	C, Python, ML, Java	0.23
19	VEERA CHAUDHARY	54.00	78.00	7.88	0	IT	C, Java, JavaScript	0.30

The Campus Recruitment Management System (CRMS) significantly enhances the efficiency, transparency, and effectiveness of campus hiring processes. By transitioning from traditional manual methods to a digital platform, CRMS bridges the gap between students, recruiters, and placement administrators. The system automates the end- to-end recruitment lifecycle, from student registration and job posting to application tracking and final selection, reducing administrative burden and human error.

The system's modular design, secure login mechanisms, and real-time updates ensure a seamless experience for all users. With features such as eligibility-based job filtering, interview scheduling, and recruiter dashboards, CRMS serves as a robust solution tailored to the needs of modern academic institutions.

Through rigorous testing and performance evaluation, the CRMS has proven to be reliable and scalable for handling large recruitment drives. Future enhancements, such as AI-based student-job matching and mobile app support, will further extend the system's capabilities and accessibility.

In conclusion, the Campus Recruitment Management System not only streamlines recruitment operations but also empowers students with better opportunities and faster access to job information, thereby supporting career development and institutional placement success.

REFERENCES

1. Jidnyasa Raut, Komal Patil, Payal Gothi, Riddhi Kamat, Prof. Nileema Pathak " CABAL: Training and Placement Departmental Portal" IOSR Journal of Engineering (IOSRJEN), Volume 3, Aug-2019.
2. Prof. Anagha Kulkarni, Priyanka Hajare, Priyanka KhandaveShitalAdhav,SwatiPimpale," Implementation of Online Placement System", IJERMT All Rights Reserved International Journal of Emerging Research in
3. Management &Technology ISSN: 2278 -9359 (Volume- 5, Issue-1), January2016.
4. Rajnish Tripathi, Raghvendra Singh, Ms. Jaweria Usmani " Campus Recruitment and Placement System" International Conference on Recent Innovations in Science and Engineering, April 2018.
5. Swati Choudhary, Monica Landge, Shital Salunke, Swarupata Sutar, Kirti Mhamunkar "Advance Training and placement web portal" International Journal of Technical Research and Application ISSN: 2320- 8163 Volume:4 Issue: 2, 2016.
6. P. Anitha Vairamany, Dr. K Subramaniyan " Placement Prediction in Self Employment Using K Means Clustering" (UGC Care Journal, Volume 40, March 2020.
7. Shubhangi Patil, Nutan Sonawane, Priyanka Kulkarni, Priyanka Khadse " Training and Placement Portal with Student Performance Analysis" International Research Journal of Engineering and Technology (IRJET), Volume- 5, May-2018.
8. Dr. Ram Joshi, Mrinal Chaudhari, Pratiksha Gaikwad, Savani Kadam " Training and

Placement Portal" International Research Journal of Engineering and Technology (IRJET), Volume-4, Dec-2017.
9. Huda Al-Shehri, Amani Al-Qarni, Leena Al-Saati, Arwa Batoaq, Haifa Badukhen, Saleh Alrashed, Jamal Alhiyafi, Sunday O. Olatunji " Student Performance
10. Prediction Using Support Vector Machine and K-Nearest Neighbor" IEEE 30th Canadian Conference on Electrical and Computer Engineering (CCECE), 2017.
11. Rashi Bansal, Akansha Mishra "Mining of Educational Data for Analysis Students overall Performance", March 2017.
12. Mishra T., Kumar D., Gupta S. " Students' performance and employability prediction through data mining: a survey" Indian J. Science Tech. June 2017.