

An Integrated Web Application for Training and Placement

¹Dr. Gauri Dhopavkar, ²Toshit Kale, ³Rajat Gaikwad, ⁴Saurabh Chavan, ⁵Gaurang Kumar, ⁶Himanshu Shendare, ⁷Harsh Akre

^{1,2,3,4,5,6,7} Department of Computer Technology, Yeshwantrao Chavan College of Engineering, Nagpur, India

Article Info

Page Number: 7739-7752

Publication Issue:

Vol. 71 No. 4 (2022)

Abstract

In today's hypercompetitive era everyone wishes to get an excellent job to meet life goals. Number of opportunities are available to Engineering students in core as well as IT sector. Securing a dream job during graduation through an on-campus recruitment drive is the desire of most of the students. Placement Cell of every organization plays a crucial role, in providing the most relevant job to every student, through an on-campus drive. The Training & Placement (T&P) cell contributes to creation of competitive human resource required by industries and other organizations. Even when the Training & Placement Cell is an important element of an organization, responsible for imparting training and creation of suitable opportunities of placement to every student, majority of its tasks are still carried out manually. The work presented here provides the details about development of a "Training & Placement Portal" system. The objective to develop such system is to automate the Training and Placement management system. This developed system helps students and people working at the Training and Placement cell to easily carry out regular tasks with high precision and in less time. This system is one-time registration enabled and notifies the student about the upcoming and ongoing recruitment process with full access to question bank, Job description related with all companies. All the personal information and academic details of every student are stored in the system. This system maintains the record of ongoing and past student batches. The Training & Placement admin provides the timeline of recruitment activities concerning placements, recruiters provide the eligibility criteria and eligible students get notified automatically. This system analyzes the statistical data to predict a suitable company for a student regarding his/her performance and achievements.

Keywords: - T&P, AI Prediction, MEAN Stack, Campus recruitment, placement drive

Article History

Article Received: 25 March 2022

Revised: 30 April 2022

Accepted: 15 June 2022

Publication: 19 August 2022

I. Introduction

It is always advantageous for a student to receive a job offer from desired company during graduation through an on-campus placement drives as there are more chances of selection in on-campus drive than off campus drives due to increased competition. As the Campus-Hiring season approaches, the work of the training & placement cell increases exponentially, and when the work must be done manually, it requires a lot of effort, resources, and leads to many errors.

In the traditional system, students and training & placement officers may face numerous challenges such as a lack of details, inadequate security, manual entries, complications, and so on.

The huge database of students aspiring for placements is very important, as it consists of academic details, and other personal details of every student.

As per the hiring company's criterion, the list of eligible students is needed to be handled carefully. Every time the placement results are out, the master data list needs to be updated.

With the result declaration of every semester, the master list (list of all students registered for placements) needs to be upgraded. The details of the drive alongwith Job Description is to be created for every company. Same is to be shared with departments for further action. This becomes very hectic and time consuming for the T&P personnel. The list keeps on updating as per the selection of students in various drives.

The proposed system seeks to address the shortcomings of the traditional placement system. The proposed Training&PlacementPortal thus computerizes the whole system of training and placement cell. It aims to facilitate quick access to placement-related activities and guarantees that student information is kept up to date. It provides several options for finishing the placement task activities we use a modular-based system in this system. The admin has the provision to add new companies, make new announcements, add new batches of students, view placement statistics, filter students, send bulk emails, etc. The students can thus, have easy communication with the Training & placement cell through the portal, learn more about the previously visited companies, attempt the mock tests, and get the prediction based on these mock tests, CRT report which company's recruitment process he can go through successfully. This system allows the company to access student information for placement purposes and can notify students about recruitment.

The project simplifies the training and placement cell's work during campus time and helps in storing the whole data in one place.

II. Literature Survey

T&P is important unit of any educational institute. Many researchers have carried out work for automating T&P activities. Some of the efforts are discussed below.

In paper [1] by A. Godawari Chouhan, Monika Devi, Prof. Teshu Gaurav Singh, authors have presented a mechanism to make the placement process smoother by giving an SMS integration page for instant notification. It uses MySQL and Linux server, and allows companies to view a few selected students' resumes.

The paper by B. Alfiya Banu, Dr. Manju Bargavi S. [2], uses PHP for linking the database and their total system is based on storing the students' data for future use.

[3] The paper by C. Navaneeth Kumar B, Vamsi Kandula, Praneeth Ambiti, K Hema, Kishore Buddha provides details of usage of data mining algorithms for understanding data, a feedback system provides feedback on every exam to students.

[4] Authors D. Alfiya Banu, Dr. Manju Bargavi S.K, representsystem that consists of an attendance monitoring system, track of the progress of courses, and multiple tree decision

algorithms are used for prediction.

In the paper by E. Anjali.V, Jeyalakshmi.PR, Anbubala.R,Sri Mathura devi, G. Ranjini.V[5], a system that provides a platform for students to register for their future companies is presented.

The paper authored by F. Mr.Rohit A.Dhole[6], the product presented offers a scheduling module in which students must enter their details at a specific time otherwise the login page gets frozen for reviewing of T&P.

G. B. L. S. Priyanka, J. Divya, K. Navya Charitha, M. Akhila [7] describes a system that provides a discussion forum for the students, as well as they, can communicate with T&P through SMS.

Authors H. K. G. Patel, C. K. Patil [8], in their paper explain about their product that allows students to upload marks on the portal so that companies could validate their profiles properly.

In the paper authored by Ajeena Sunny, Aneena Felix, Angelin Saji, Christina Sebastian, Praseetha V.M[9], a system that uses the Laravel framework with a Model-View Template pattern for developing this web application is presented.

J. prof. S.S.Pophale[10] proposed a system where students can contact alumni and can clear their queries.

K. Twinkle Panchal, Mayuresh Wadke, Prof. Aishwarya Sedamkar [11] describes a system that uses - HTML, CSS and JavaScript PHP, and MY SQL.

L. Maryam Sayyed, Faiza Umatiya, Seemab Zehera, and Prof. Shiburaj Pappu[12] have presented a system that provides a direct E-interview system to take interview after tests for candidates that have scored above cut-off marks.

M. FarheeTaqi Rizvi, Naushin Arif Khan, Saurabh Sanjay Upadhyay, Prof. Sonali Suryawanshi[13], proposed a system that provides Automatic percentage and CGPA calculator that helps students to eliminate errors.

N. Akshay Venugopal, Ashik Paily, Balaji V Shenoï3, Bibin T Varghese, Sreenimol K R [14] presented a system where the recruiters themselves can verify or validate the student's information; they can access the site by giving the skills required beforehand.

In their paper, authors O. Santhosh Kumar H, Mrs. Srividhya V R[15] proposed a system where admin can search students using phone no, email id, registration id etc.

P. Akash Kumar, Manisha Chauhan, Yash Srivastava, Madhavi Mane [16], through the paper described a system that provides access to every faculty in order to check which student was present in which drive for the proper attendance procedure

Q. Samrudhi Padwal, Samruddhi Ghorpade, Prof. P.R. Patil, Manasi Patil, Shraddha Biraj, Sapana Salunkhe[17] proposed a system where students can interact with the alumni's using chat box.

In the paper by R. Muniraju N, Amutha N [18], authors proposed a system where company can view student's resume and can filter the student's profile as per requirement.

S. Dr. Angel Latha Mary.s, in her paper[19], proposed a system where students can search for the material required for the selection process for placement papers.

T. Prof. Rupali Komatwar, Swapnil Kamble, Mihir Khedekar, Kishor Walzade[20] describe a system that consists of a separate login for the alumni's in the portal where they will be only allowed to view the data and reply the queries of the current candidates.

Previously few efforts have been undertaken to provide intelligence to the T&P related system. Some of the algorithms are mentioned below.

A supervised learning algorithm is a random forest. An ensemble of decision trees, often trained using the "bagging" approach, make up the "forest" that it constructs. The bagging method's main premise is that combining learning models improves the end outcome. Random forest algorithm works in such a way that first random samples and data have to be collected then the algorithm constructs the tree for each data set this is followed by voting for the decision tree and thus the most voted result is predicted result. In the Training, Placement, and career guidance portal the random forest algorithm is used in such a way that according to the CRT marks, and mock test analysis the company which is mostly referred to the students with those marks. This is basically a random forest algorithm. Random forest adds supplementary randomness to the prototype while growing the trees. Rather than searching for the numerous important feature while dividing a node, it explores the best feature among a random subset of features. This results in a vast variety that normally results in a more satisfactory model.

One of the most suitable linear and non-linear binary classifiers is the SVM classifier. SVM regressors are also viewed as a viable alternative to more conventional regression techniques like linear regression. SVM is chosen over other algorithms because it also works properly when the data is not distributed regularly, it overpasses the condition of over fitting, and it showcases the best results for classification types problems. A mapping function is used for prediction and converting independent variables into dependent variables. SVM uses a conclusion boundary as its mapping function to differentiate between two or more classes. The most important part of SVM algorithms is the way the conclusion boundary is drawn or specified. In the Training, Placement, and Career guidance portal the SVM is used similarly for prediction by maximizing two or more outputs and making the predictions more specified.

A gradient-promoting framework is used by the chorus machine learning method XGBoost, which is decision-tree based. Artificial neural networks typically surpass all other algorithms or frameworks in predicting problems involving unstructured data. This algorithm is preferred over other because it runs smoothly on Windows, Linux, and OS. It supports AWS, Azure, and yarn clusters also. The XGboost algorithms works similarly by creating the nodes and then minimizing the errors.

III. Proposed System

Whenever the company starts visiting the college the workload of the training and placement cell increases as all the work is done through excel sheets thus increasing the chances of

errors and making it more difficult in storing the data properly. The proposed system computerized the whole system and makes the tedious work of the training & placement cell smooth. Broadly the whole system is divided into two modules, one is admin and the other is student, the access system is also the same as the modules.

Objectives of developing the T&P Portal are as follows-

To enable all students to register for T&P activities.

To enable T&P cell officials to identify eligible students as per various companies' criterion, analyze the T&P related data, and plan suitable actions.

To allow T&P Cell to make announcements regarding recruitment drives.

Provide information regarding the company's recruitment process using the previous year's analysis.

MEAN tech stack is used in this project which comprises MongoDB, Express, Angular, and NodeJS. GitHub is used to provide version control. Various libraries from NodeJS were used to provide additional functionalities like mongoose to integrate with Database, node mailer, validator, and jsonwebtoken. A special library named "convert-excel-to-JSON" was used to provide the list of users even with the help of an excel sheet.

Considering the admin module, admin has a provision to add companies to the portal, make new announcements related to the placement, and the arrival of the company, add new student batches, view company recruitment history as to which company gave how many offers to students, and visited how many times, the more tedious task is to filter students as to which student is eligible for the particular company, in the present system this task is done through excel sheets and done manually but the proposed system filters the students accordingly, the proposed system also sends bulk emails to the filtered students.

A. Adminprivileges:

- 1) Company Registration
- 2) Make Announcements
- 3) Displaying PlacementStatics
- 4) Filtering Students
- 5) Create a new Batch
- 6) Schedule Placement drives

Considering the student module, the student can communicate with the training & placement cell through this proposed system, they can register for companies on the portal, can use the provided templates for resume building and create the resume over there, view company recruitment history and make the decision accordingly, an AI-based prediction model is present which predicts which company a student can target based on his previous

performance in CRT tests, mock test present on the portal, they also have a provision to add their interview experience on the site so that it will be helpful to other students.

B. Student Privileges

- 1) Student Registration
- 2) Uploading Resume & certifications.
- 3) View the Recruitment timeline.
- 4) Register for Recruitment activity.
- 5) Predict placements based on past performance.
- 6) Interview experience for future candidates.

The Database contains all the information regarding the companies that visited the college placements. The list which contains the status of the student i.e. whether the student is placed or not will change automatically when the student gets placed in a certain company. The admin can also view the names of the company a student has got an offer from and make the decision accordingly. If the student has got more than two offers then the student will be removed from the further placement opportunity. If the user still applies for a drive without the permission of the training and placement cell, he will be given a red flag which will stop him from accessing the TP&G portal. If the student gets three red flags is will lose his complete involvement with the training and placement cell. The admin can check the company and find out how many students they selected in the previous year and plan the proceedings accordingly.

The T& P portal is equipped with a dashboard that shows all the major statistics about the placement to the admin. The admin can find out which section of students are facing problems with the placement and then make changes in the drives accordingly. The admin can view a particular set of students like students with less than 60% in the 12th board and find out how many of them are still not placed and then bring in the companies which don't have such criteria for placement. The admin can also contact the alumni easily if the student has used the TP&G portal because the database has all the information about the student and the company in which he has been placed. This can help the TP&G cell to schedule a seminar which will help the students during the placement drive.

C. System Architecture

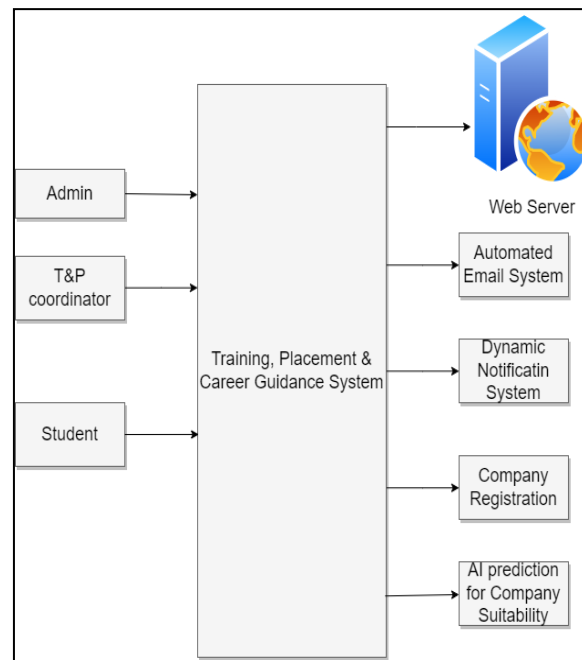


Fig. 1. System Architecture

As shown in the Fig. 1, the system majorly consists of two main components namely student and admin. The project was designed based on the framework. Business entities layer: It comprises all the entities in the project. Business logic layer: This layer operates on the business entity to give them all the functionality in their domain. The admin is given the authority to add new student batches and new companies. Admin is responsible for managing the student discussion forum and also has the authority to look up directly at the database which consists of all the information about the user. Data access layer: This layer serves as an interface between the backend which comprises data and the services such as emailing and notification. The Web application portal acts as an interface for a user.

The database used here is an unstructured database called MongoDB as it gives additional functionality for manipulating

the documents which are very necessary for accessing the details of every individual. In this Project, various models are created according to the need of every entity for storing the data such as the user model, company model, feedback model, and announcement model. All the data regarding the users who can access the portal is stored in a database collection called as user model which consists of three types of users namely student, admin, and coordinator. The admin has all the functionality which includes adding the new company for registration, editing the student status from unplaced to placed, and giving red flags to students for non-compliance with the conditions of the TP&G cell. The admin also acts as moderator for all the interview experience which is shared on the portal.

JavaScript Objects Notation Web Token or JSON Web Token abbreviated as JWT, it is a technique that verifies the owner of JSON data and, a URL-safe string that is cryptographically

signed that can contain an infinite amount of data. Client-Server Scenario with JWT Refresh Token. In the beginning of the process, client sends a request to the Authentication Server with their credentials like College ID along with Password. The user can be the admin, student, or co-ordinator. After that, the Authentication Server verifies the user information and its authenticity. If it is found to be valid then the server will provide the JWT Valid Access Token and Refresh Token which is referred as one-time session key. Then, the user stores that token on the client side somewhere in the primary memory of computer system. Now, User has authority to send the request to the backend server for accessing the secured resources with JWT Valid Access Token in the header.

An example of this is the interview experience approval feature which is available for admin only normal students cannot access this feature in our project. This feature allows admins to approve interview experiences shared by the students to display them further. Meantime, the User can send the request as many times as he/she wants to be i.e., on second time, the backend server to get access of another service, and in such cases, if JWT Valid Access Token is expired then the server will respond only to the end user. The expiration of the token means the user is logging out or any unexpected error occurs in the process. In such cases, when the JWT Valid Access Token is no longer available due to expiry then the user sends a request for authentication to Authentication Server with Refresh Token to get a new JWT Access Token.

The server checks the user information and sends a new access token along with a refresh token too. The end-user then has more life of a session than the Simple JWT Valid Access Token. As the portal runs processes continuously while working on the portal, it is easier to get access to new services and resources on the internet

Student Selection The project has a filtering function that allows the administrator to filter students according to their needs or the

company's needs. This means that the administrator can sort students on the following grounds:

- GAP year
- back year
- 10th percentage
- 12th board percentage
- CGPA

This makes it easy to send custom emails. It also makes sure that important mail is only delivered to the target students,

avoiding spamming the students' inboxes.

IV. Proposed Methodology

A. Workflow

After login, a user enters the web application, a user is given functionalities according to permission. Generally, recruitment activities begin from the sixth semester. Students have an option to opt between four streams that are placements, higher studies, entrepreneurship, and other. Admin adds a new batch of sixth semester students before recruitment activities start in the campus. Those who want to get placement from campus are included in the batch. After registering into the portal, each student needs to fill up a form that contains their personal, and academic details along with certifications of achievement if any. This registration form can be filled up only once but it can be edited multiple times except for information like registration number, and branch. Students have provision to see the best templates of resumes which helps them to create impactful resumes on their own.

Admin makes a schedule of upcoming drives which are then visible to students and coordinators. For each recruitment activity, the admin fills form to add company detail which also includes the eligibility criteria set by the recruiters. Admin has a facility to filter out students according to the eligibility criteria of recruiters. Admin can make general announcements within portal but for exam links, notice, and other notifications admin has a provision to send bulk emails to students. Admin and coordinators have authority to mark red flag to students who break college policies and code of conduct of T&P cell. They are not allowed for further recruitment activities and are removed from batch. Before appearing recruitment tests, students can learn and develop themselves by predicting their best-suited companies according to their skill set using AI.

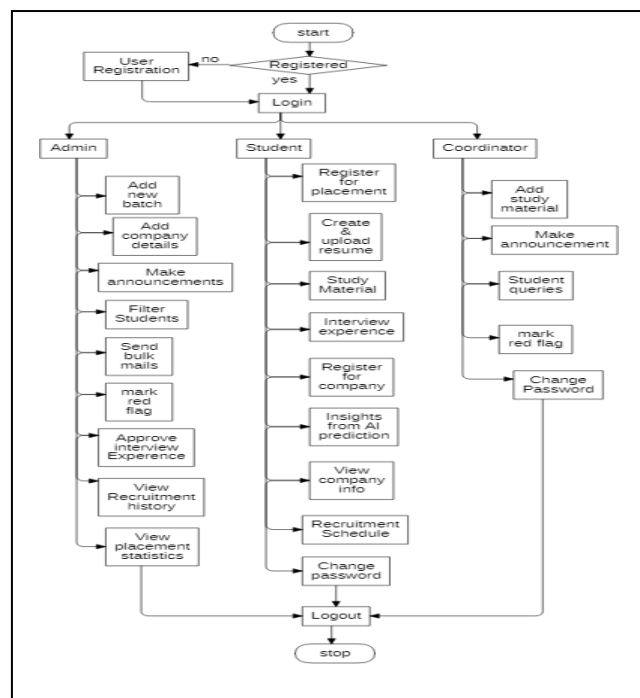


Fig. 2. Overall workflow of the proposed system

To practice for a particular placement drive and interview, a student can take help from the database present in the portal which mainly includes previous year's questions and relevant study material. For helping the next batches, students can write their own interview experiences which can be moderated by the admin to avoid false information. Department coordinators continuously add study material and make only announcements particular to that department.

B. Use case

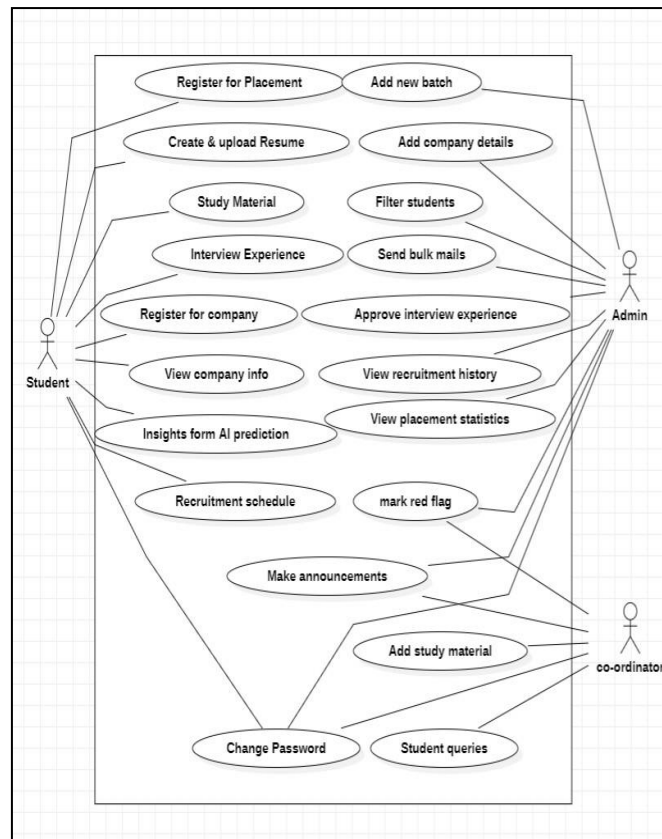


Fig. 3. Use Case diagram showing various use cases of actors.

Three users will manage the T, P&CG Portal. The administrator is the first user, followed by a student and co-ordinator. Various use cases of actor students are depicted in the use case diagram. A student has the option to sign up for recruitment activities on their own. Furthermore, the portal includes functions like uploading resumes and certificates. It also includes AI prediction using which a student can find the companies which are best suited, based on the score of the mock test. Students can also get help from the past interview experiences of alumni uploaded by them. And students can add their interview experience too. The recruitment Schedule will be visible to every student. And students will get notifications of every company visiting the college campus.

The administrator is the user who oversees all aspects of recruiting, including setting up timeframes for drives, adding new drives, vetting students, issuing announcements, etc. Admin can also send emails in bulk, to the selected students. Admin can also view placement

statistics. Admin has the authority to mark red flag to the students who do not follow the placement rules. The coordinator can add study material, and make announcements. The coordinator can also reply to the student's queries and can mark the red flag.

V. **Conclusion**

The proposed methodology has addressed requirements like registration of eligible students for upcoming campus drive, addition of new user, sending alert to all eligible students, sharing Training and Placement information with all, security of the master list,

The administrator has privileges like creation of student list, sending notification to all eligible students, verifying student data for each drive. This system also has an AI Prediction System that uses mock test results to determine the best company for the student.

However, it has some limitations which can be further taken into consideration and can be included in the future. The proposed system lacks a performance tracker which will keep track of the performance of students' mock test given on the platform, mock test analysis report and detailed solution for the mock test can be provided by the institution, weekly coding contest can be held on the platform which will help students to develop their coding skills for the placement drives.

VI. **Future Scope**

A. Mock Tests

Students will be provided with mock tests of every type of exam that the upcoming company asks for. Weekly tests can be conducted for the common sections such as Quantitative Aptitude, Logical Reasoning, Data Interpretation, Analytical Reasoning, Verbal Ability, Coding, Pseudo Codes, and Technical CS Subjects. The weekly test will help a student to understand their strengths and weakness on a particular topic so that they can work on it. It will also be easy for the college to track the student performance as they will be having a huge set of data. Sometimes students are not aware of the tests that are based on different games that check for the observation and learning skills of the candidate. These tests require practice prior to the test, so by giving this functionality it will be very helpful for the students to get comfortable for these types of tests.

B. Performance tracker

The mock tests given by the students will be represented in a graphical way in the form of bar graph and line graphs by using BI. This will help the student to quickly analyze his performance. It will show the marks and percentile of the student in the particular test. It can also motivate students by giving them an idea about their mistakes and giving a jolly message after their improvement, after every test, by the AI-based model.

C. Chatbox for alumni interaction

Many students don't have contact with the seniors of the college, so they are unable to clear their doubts about the company that they target, as the alumni can give detailed information

about the company, he is working in. So, the students will be provided with a window to drop a query to the alumni, and the active alumni can resolve the query. The query will be visible to all other students but will be named anonymously.

D. Mock Tests Analysis

College can provide a detailed solution with an explanation by an expert for all the mock tests, this will help students to clear their doubts easily.

E. Weekly Coding Contests

A weekly intercollege coding contest will allow students to know their competition better for the on-campus drive, it will be one of the best ways to learn competitive programming, as learning cp is always an upper hand during the placements.

References:

- [1] Godawari Chouhan, Monika Devi, Prof. Teshu Gaurav Singh,” Review on Training & placement Cell System”, *International Journal of Latest Technology in Engineering, Management & Applied Science (IJLTEMAS)*, vol. 6, issue. 3, pp. 205-208, March 2018, ISSN 2278-2540
- [2] Alfiya Banu, Dr. Manju Bargavi S,” A Research on Placement Management System”, *International Journal for Research in Applied Science & Engineering Technology (IJRASET)*, vol. 10, issue: 4, pp. 1853-1859, April 2022, ISSN: 2321-9653, doi: 10.22214/ijraset.2022.41657
- [3] Navaneeth Kumar B, Vamsi Kandula, Praneeth Ambiti, K Hema, Kishore Buddha,” Student Analysis System for Training and Placement”, *International Journal of Recent Technology and Engineering (IJRTE)*, vol. 8, issue. 6, pp. 3996-3999, March 2020, ISSN: 2277-3878, doi: 10.35940/ijrte.F9211.038620
- [4] Alfiya Banu, Dr. Manju Bargavi S.K, “A concise study on Placement Management System”, *International Journal of Computer Technique*, vol. 9, issue. 2, pp. 187-192, Apr 2022, ISSN: 2394-2231
- [5] Anjali.V, Jeyalakshmi.PR, Anubala.R, Sri Mathura Devi.G, Ranjini.V, “Web Based Placement Management System”, *International Journal of Computer Science and Information Technologies (IJCSIT)*, vol. 7, issue. 2, pp. 760-763, 2016, ISSN: 0975-9646
- [6] Mr. Rohit A. Dhole, “Web Based Automation of Training and Placement Cell”, *International Journal of Scientific & Engineering Research (IJCSIT)*, vol. 7, issue 2, pp. 529-531, Feb 2016, ISSN 2229-5518
- [7] B. L. S. Priyanka, J. Divya, K. Navya Charitha, M. Akhila, “Training & Placement Management System”, *UGC Care Group I Listed Journal*, vol. 11, issue. 1, pp. 447-453, 2021, ISSN 2278-4632
- [8] K. G. Patel, C. K. Patil, “Study of Implementation Of Online Placement System”, *International Conference On Emerging Trends in Engineering and Management Research (ICETEMR)*, pp. 1015-1021, March 2016, ISBN: 978-21-932074-7-5

- [9] Ajeena Sunny, Aneena Felix, Angelin Saji, Christina Sebastian, Praseetha V.M, “Placement Management System for Campus Recruitment”, *International Journal of Innovative Science and Research Technology*, vol. 5, issue. 5, pp. 1705-1710, May 2020, ISSN: 2456-2165
- [10] Prof. S.S. Pophale, “Training and Placement System”, Information Technology DVVP COE Ahmednagar, pp.1-5
- [11] Twinkle Panchal, Mayuresh Wadke, Prof. Aishwarya Sedamkar, “Placement Management System”, *International Research Journal of Engineering and Technology (IRJET)*, vol. 9, issue. 4, pp. 2584-2588, Apr 2022, ISSN: 2395-0056
- [12] Maryam Sayyed, Faiza Umatiya, Seemab Zehera, Prof. Shiburaj Pappu, “College Placement Management System”, *International Journal of Creative Research Thoughts (IJCRT)*, vol. 8, issue. 6, pp. 3098-3102, June 2020, ISSN: 2320-2882
- [13] FarheeTaqi Rizvi, Naushin Arif Khan, Saurabh Sanjay Upadhyay, Prof. Sonali Suryawanshi, “Placement Support System”*International Journal for Research in Applied Science & Engineering Technology (IJRASET)* , vol 9, issue 1, jan-2021,ISSN: 2321-9653,doi: 10.22214/ijraset.202103264
- [14] Akshay Venugopal, Ashik Paily, Balaji V Shenoi3, Bibin T Varghese, Sreenimol K R, “Online Placement and Recruitment System”, *International Journal of Advances in Computer Science and Technology*, vol. 9, issue. 6, pp. 25-29 June 2020, ISSN: 2320-2602,doi: 10.30534/ijacst/2020/05962020
- [15] Santhosh Kumar H, Mrs. Srividhya V R, “Online Training and Placement Management System”, *International Journal of Engineering Research & Technology (IJERT)*, vol.4, issue. 22, pp. 1-6, 2016, ISSN: 2278-0181
- [16] Akash Kumar, Manisha Chauhan, Yash Srivastava, Madhavi Mane, “Online Training and Placement Management System”, *International Journal of Scientific Development and Research (IJS DR)*, vol. 5, issue. 4, pp. 364-366, April 2020, ISSN: 2455-2631
- [17] Samrudhi Padwal, Samruddhi Ghorpade, Prof. P.R. Patil, Manasi Patil, Shraddha Biraj, Sapana Salunkhe, “E-Training and Placement Management System”, *International Research Journal of Modernization in Engineering Technology and Science*, vol.4, issue. 6, pp. 4324-4329, June 2022, ISSN: 2582-5208
- [18] Muniraju N, Amutha N, Placement Cell Management System”, *International Journal Of Progressive Research In Science And Engineering*, vol. 3, issue 3, pp. 50-53, March 2022, ISSN 25827898
- [19] DR. ANGEL LATHA MARY.S, “E-PLACEMENT MANAGEMENT”, *International Journal of Pure and Applied Mathematics*, vol. 119, issue. 10, pp. 1823-1826, 2018, ISSN: 1311-8080
- [20] Prof. Rupali Komatwar, Swapnil Kamble, Mihir Khedekar, Kishor Walzade, “Placement Support System”, *International Journal of Advanced Research in Computer and Communication Engineering*, vol. 5, issue.1, pp. 316-319, Jan 2016, ISSN 2278-1021, doi. 10.17148/IJARCCE.2016.5178