Hybrid-Training & Placement Management with Prediction System

Ipshita Das[1], V Akshid[2], Shashi Kant Mishra[3]

[1,2]*B.Tech Student CSE Department, Bhilai Institute of Technology, Raipur, India*
[3]Assistant Professor, *CSE Department, Bhilai Institute of Technology, Raipur, India*

---***---

Abstract - *Training and management of placement is a crucial part of an educational institution in which most of the work is done manually. Manual system in the colleges requires a lot of manpower and time. Hence this hybrid system creates student and company databases. It can be accessed throughout the college with proper login provided. The developed system can guarantee to keep the records are safe. A placement predictor is to be designed to calculate the possibility of a student being placed in a company, subject to the criterion of the company. To achieve a better prediction system, we intend to use Machine Learning and here we are using prediction models like Logistic Regression, Decision Tree Classifier, Unsupervised learning which will cause a continuous accuracy growth.*

*Key Words***: Machine Learning, Logistic Regression, Decision Tree Classifier, Unsupervised Learning.**

1. INTRODUCTION

Placements are considered to be very important for each and every college as it is the most important part of student's life. The basic success of the college is measured by the campus placement of the students. Every student takes admission to the colleges by seeing the percentage of placements in the college. Placement management system helps the training and placement officers to overcome the difficulty in keeping records of hundreds and thousands of students and searching the eligible students for recruitment, based on various eligibility criteria of different companies. It helps in effective and efficient utilization of the hardware and the software resources. It also makes the placement prediction based on the students records and helps the management to cluster the placed students based on their streams using K-means clustering. The project facilitates user friendly, reliable and fast management system. The placement officer itself can carry out operations in a smooth and effective manner. The college can maintain computerized records thus reducing paper work, time and money.

1.1 SCOPE OF THE PROJECT

Every university provides campus placement opportunity for each and every student however many of them just keeps the record in just excel sheets or paper, which on time required can not perform a better statistical analysis.

Hence this project is very useful for those situations when we neglect to be arisen.

2. PROBLEM STATEMENT

With the conventional method of keeping records of the students and maintaining, it becomes hectic when it comes to predict the analysis of future growth or the number of students can be placed at that moment. The older methods can either manage the MIS or predicts the placement

3. METHODOLOGY

Training and Placement management system in a university is very important and essential part to be implemented on MIS. This provides the TPO cell various features which completely facilitates for ease of work.

3.1 FEATURES

3.1.1 Authentication

Authentication is the process which has to be primarily installed in each and every application, website, etc.

This feature involves three types of authenticity:

1. admin/TPO head

2. Departmental TPO

3. Student

3.1.2 MIS Functionalities

The functionalities of this hybrid and dynamic MIS deal with CRUD operation of Jobs, Trainings, Students, Departmental TPO, Alumni, Placement Records, etc.

The TPO/admin can add, read, update and delete all the possible functionalities that a training and placement system requires by accessing the data entered by the student and analyzing the statistics based on the data on records.
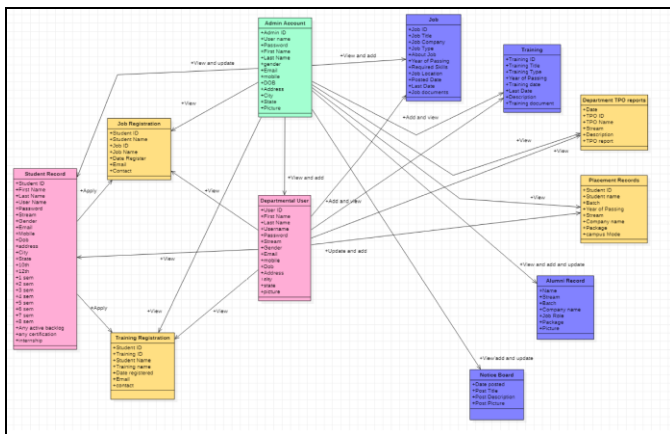
Fig -1: Data Flow Diagram

3.1.3 Prediction System

In this paper we used various machine learning techniques to predict a particular student placement based on data available in the data set entered and updated while registering by the student. Another prediction is based on the total number of students getting placed in the upcoming years by learning the graph from previous years.

The models which we used for both the prediction are SVM, Logistic Regression, Random Forest Classifier, XGBoost Classifier.

Primarily the data is gathered from the T&P department and preprocessed the data. After that the preprocessed data was again processed for relevant prediction. Then the data was split into training and testing following the models were trained and tested.

a. **LOGISTIC REGRESSION**

Logistic regression is a machine learning model which is used for binary classification problems, like whether the student will acquire placement or he need to work hard on the place he is lagging behind. It takes input various factors and bound to give binary output between 0 and 1.

Logistic function = $1/(1+e^{-x})$

This is the logistic equation in which x is the input variable after processing it will give binary output.
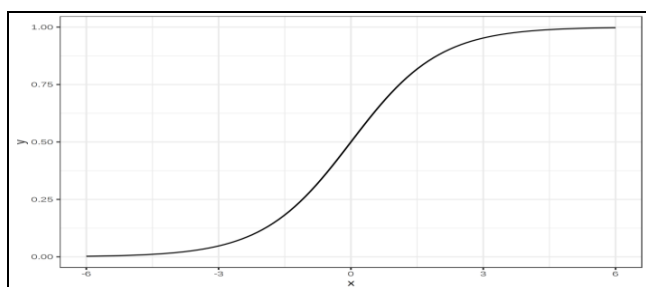

Fig -2: Logistic regression

b. **DECISION TREE CLASSIFIER**

This model is a supervised learning model used for both classification and regression problems. It is tree structured classifier in which internal nodes represents the feature of the dataset, where branches represent the decisions and leaf node provides the outcome.

It the just similar to the tree where the process starts with the root and finishes in the leaf based on the decisions taken and dividing the tree into sub-trees.

c. **RANDOM FOREST**

Random forest model is very popular supervised machine learning algorithm used for classification as well as regression. This model is capable of combining various classifiers and solve a complex problem and improves the performance.

This model consists of various decision tree on various subset of the dataset provided and takes the average to give better output. Instead of trusting on decision trees it takes predictions from each tree with maximum votes for the final output.

d. **XGBOOST CLASSIFIER**

XGBoost, which stands for Extreme Gradient Boosting, is a scalable, distributed gradient boosted decision tree machine learning library. This is used for the problems like regression, classification, and ranking problem.

This algorithm finds pattern to train in a dataset with labels and features and predict the labels on a new dataset's features.

e. **SUPPORT VECTOR MACHINE**

This supervised learning model is primarily used for classification problems. This algorithm uses decision boundary that divides n-dimensional space into classes so we can easily put upcoming data into correct category.

Labeled data is used to train the model. The model is used for prediction and hence the output is predicted.

f. **LINEAR REGRESSION**

This machine learning model is based on supervised learning and used for regression task. This predicts the output based on the values of independent variables. It finds the relationship between variable and output. The output of the targeted prediction is completely dependent on the number of independent variables and relationships between them.

Linear Equation = Y = a + bX
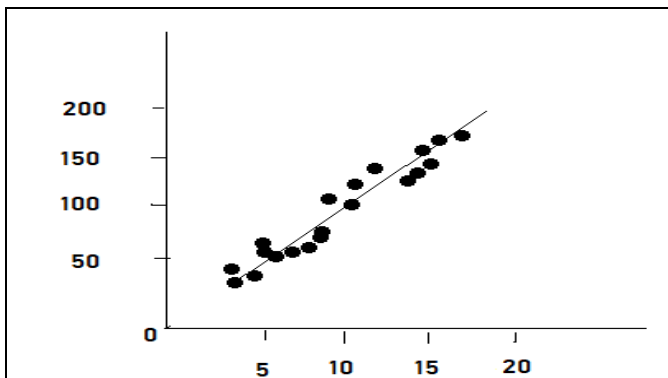Where,
Y = dependent variable
X = Explanatory variable

Fig -3: Linear regression

This all are the models which we implemented in this paper and worked on to get various prediction scores and future total number of students getting placed in the upcoming years.

This hybrid project is very rare in which both the MIS along with machine learning prediction model is been implemented for proper understanding of the statistics of the individual as well as organizational growth in terms of placement and understanding the barrier which is affecting the student placements.

4. RELATED WORK

Farheen Taqi Rizvi, Naushin A. Khan, Saurabh Upadhyay, Sonali Suryawanshi, Shiburaj Pappu **[2]** worked on creating the full stack for MIS of student management system with proper authentication and working of the project.

Irene Treesa Jose, Daibin Raju, Jeebu Abraham Aniyankunju, Joel James, Mereen Thomas Vadakkel **[5]** did their study on student placement prediction using various machine learning supervised models or algorithms. They derived the conclusion that SVM model was accurate about 100 accuracy score followed by Logistic Regression, which acquired accuracy score of 97.5.

Pothuganti Manvitha, Neelam Swaroopa **[8]** made the same study on the student placement prediction with implementation of two algorithms Random Forest with accuracy of 86 score and Decision tree with 84 accuracy score.

5. RESULT

This project is completely made in python language and Django as a web framework used to design the front end and linking to the back end. For the database SQLite is used which is default in the Django setup.

Along with the Management Information System the prediction part is also done with the help of python, csv format dataset, sklearn library for machine learning models.

The datasets is real dataset of our college placement of various batches that took part into campus or ofcampus placements.
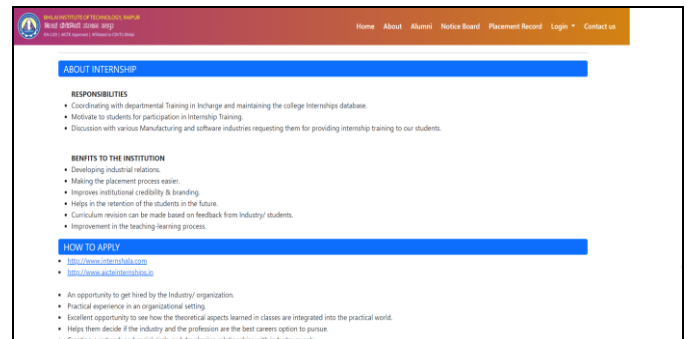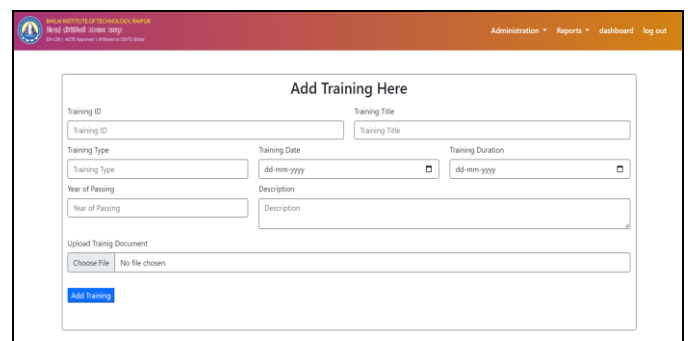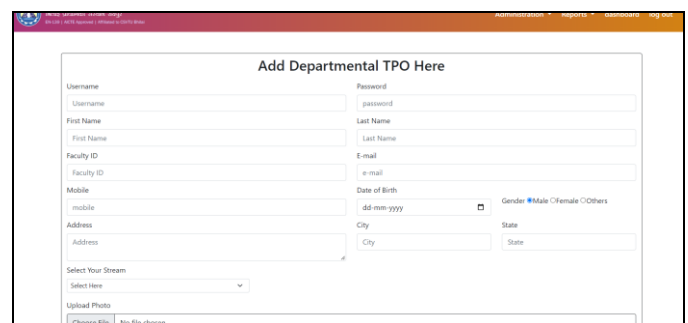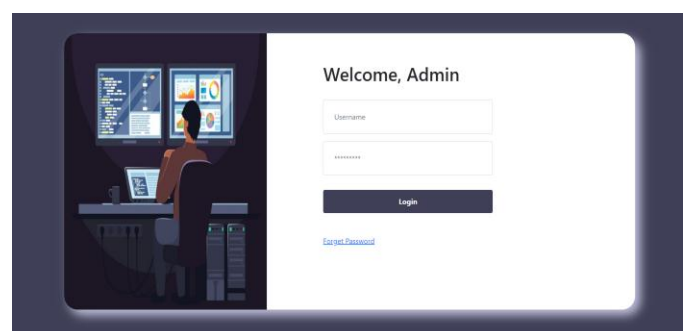

Fig -4

Fig -5

Fig -6

Fig -7

Fig -8

Fig -9: Dataset for prediction

Fig -10: Training and Testing data

6. FUTURE ENHANCEMENT

As the data goes on increasing into the management system the prediction models will be trained with more precession for growth in accuracy score as it is providing now.

In the Student Training and Placement management system we can modify according to the needs of the administration.

7. CONCLUSIONS

Training and Placement management with prediction system is unique method of implementing a dynamic Management information system into any technology. This can work as recording data, registrations, authentication, dynamically performing all the task that a T&P cell of a university requires. As of previous studies and paper they have implemented both of the work separately and none of the paper implemented both the methods together which we implemented.

As of the prediction part we had the real dataset of placement in our college of which we had implemented supervised machine learning models like Logistic regression, Random Forest, Support vector machine, Decision tree classifier, XGBoost classifier in which the best score provided was by XGBoost and Decision tree classifier model. The least accuracy score in our case was given by Support vector machine model.

8. REFERENCES

[1] Online Training and Placement Management System, Santhosh Kumar H, Mrs. Srividhya V R International Research Journal of Engineering and Technology (IRJET) , Volume: 04 Issue: 22 |2016.

[2] PLACEMENT MANAGEMENT SYSTEM 1Farheen Taqi Rizvi, 1Naushin A. Khan, 1Saurabh Upadhyay, 2Sonali Suryawanshi, 3Shiburaj Pappu Journal of Emerging Technologies and Innovative Research (JETIR) , Volume 8, Issue 4 |Apr 2021 .

[3] STUDENT PLACEMENT PREDICTION USING MACHINE LEARNING Shreyas Harinath 1, Aksha Prasad 2, Suma H S3, Suraksha A4, Tojo Mathew 5 International Research Journal of Engineering and Technology (IRJET) Volume: 06 Issue: 04 | Apr 2019 .

[4] A Review: Placement Prediction using Machine Learning Prof. Salve B. S1 Shivaji Waghmode2 Amol Kharade3 Manoj Kharade4 Sorate Sajjan5 International Journal for Scientific Research & Development| Vol. 7, Issue 09, 2019 .

[5] Placement Prediction using Various Machine Learning Models and their Efficiency Comparison Irene Treesa Jose 1, Daibin Raju2, Jeebu Abraham Aniyankunju3, Joel James4, Mereen Thomas Vadakkel 5 International Journal of Innovative Science and Research Technology Volume 5, Issue 5, May – 2020.

[6] Placement Management System for Campus Recruitment Ajeena Sunny1 Aneena Felix1 Angelin Saji1 Christina Sebastian1 Praseetha V.M2

International Journal of Innovative Science and Research Technology Volume 5, Issue 5, May – 2020.

[7] Placement prediction system using machine learning Rathi Viram, Swati Sinha, Bhagyashree Tayde , Aakshada Shinde International Journal of Creative Research Thoughts (IJCRT) Volume 8, Issue 4 April 2020.

[8] Campus Placement Prediction Using Supervised Machine Learning Techniques Pothuganti Manvitha Neelam Swaroopa International Journal of Applied Engineering Research ISSN 0973-4562 Volume 14, Number 9 (2019).