



PROJECT REPORT

MACHINE LEARNING  
Predictive Model for Student Placement and Graduation

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| **Created On:** | 08-09-2023 | **Approved On:** | DD-MMM-YYYY |

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# **PROJECT DETAILS**

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| --- | --- | --- | --- |
| **Project Name** | Predictive Model for Student Placement and Graduation | | |
| **Project Sponsor** | Tushar Topale | | |
| **Project Manager** | Harshada Tople | | |
| **Start Date** | 05-08-2023 | **30-09-2023** |  |

# **SUMMARY**

This project aimed to develop predictive models for student placement and

graduation year estimation within institution. These models were vital to

optimize resource allocation and support services. The need for these models

stemmed from the institution's goal to enhance student success, resource

efficiency, and overall institutional growth. In the long term, successful

implementation of these models promised improved student outcomes,

efficient resource allocation, potential institutional growth, and the prospect of

cross-institutional collaboration for broader educational advancements.

# **INTRODUCTION**

## Background

Lack of clear academic planning and career advice is the root cause of the

issues with the students not knowing when they will graduate and not

receive a placement. Individual not prepared for job market without

understanding of the placement specific skills

## Stakeholders

*<Take this section from the problem statement & the discussion points from requirement elicitation meeting>*

<Type Here>

The Student Placement Prediction Project and Graduation calculation

syatem involves key stakeholders:

• Institution Leadership: Decision-makers interested in efficiency and

• resource allocation.

• Academic Staff: Faculty and advisors focused on academic planning

and student support.

• Career Services: Responsible for placements and career guidance.

• Students: Beneficiaries seeking timely graduation and successful

placement.

• External Institutions: Potential collaborators for data sharing and

research

## Objectives

The primary objective of this project is to develop robust and accurate predictive models to enhance the academic and career success of students within our institution.Specifically, the project aims to develop predictive model for student placement and calculation for year graduation which accurately forecasts whether student secure placement and when student will graduate. Enhance the institution's ability to provide timely and personalized support to students, aligning their academic and career aspirations.

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# **METHODOLOGY**

## Considerations & Assumption

* Constraints:

1.High Accuracy Requirement: One of the project's constraints is that the

machine learning models must achieve a high accuracy rate. This sets a

performance benchmark that the models need to meet.

2.Output Format: The final prediction results are required to be stored in an

Excel file. This constraint specifies the output format, which may influence

the final implementation and reporting of results.

* Risks:

1.Model Overfitting: There is a risk that your predictive models may overfit

the training data, leading to poor generalization on unseen data.

2.Model Underfitting: Conversely, your models may underfit the data, failing

to capture the underlying patterns, and resulting in low predictive

accuracy.

3.Data Quality Issues: You acknowledge the risk of data quality issues,

such as missing values, outliers, or inaccuracies in the data, which can

adversely affect model performance.

* Assumptions:

1.Linearity: You assume that the relationships between the predictive

features and

the target variables (placement ) are linear.

2.Independence of Errors: the errors (residuals) in the predictive

models are independent of each other. This assumption is essential for the

validity of statistical inference.

3.Homoscedasticity: assume that the variance of the errors is constant

across all levels of the predictor variables.

## Approach

1. Problem Framing and Objectives:

Begin by clearly defining the problem, its context, and the desired

outcomes. Establish specific objectives, such as predicting student

placements and graduation years, to provide a clear direction for the

project.

2. Data Collection and Assessment:

Gather relevant data related to students, including academic records,

internship histories, and joining dates. Evaluate the quality and

completeness of the data to ensure its reliability.

3. Exploratory Data Analysis (EDA):

Explore the data to discover patterns, relationships, and insights. EDA

helps inform feature selection and modeling decisions by uncovering

valuable information within the data.

4. Data Preprocessing:

Prepare the data for modeling by addressing missing values, outliers, and

data inconsistencies. Apply feature engineering techniques to extract

meaningful information from the raw data.

5. Model Selection:

Choose suitable machine learning algorithms based on the nature of the

Problem.

6. Model Development and Evaluation:

Develop machine learning models to achieve the defined objectives.

Evaluate the models' performance using relevant metrics to assess their

accuracy and generalization capabilities

9. Model Interpretability Techniques:

Explore techniques to enhance the interpretability of complex machine

learning models.

10. Documentation and Reporting:

Maintain comprehensive documentation of project processes, code, and

results. Summarize findings, achievements, and reports and presentations.

## Activities

1)Project Planning: Initial project scoping, objective setting, and timeline

planning.

2)Data Collection: Gathering student-related data, including academic

records and joining dates.

3)Data Preprocessing: Cleaning, handling missing values, and feature

engineering.

4\_)Model Development: Creating machine learning models for placement

prediction and graduation year calculation system.

5)Evaluation: Assessing model accuracy and performance.

6)Documentation: Maintaining project documentation.

7)Reporting and Presentation: Summarizing findings.

# **TARGETTED V/S ACHIEVED OUTPUT**

* Targeted Output:

1)Placement Prediction Model: The project plan aimed to develop a predictive

model for student placement. The plan envisioned the development of an early

warning system to identify students at risk of placement or graduation delays.

2) Graduation calculation system: aimed to calculate student’s expected

graduation years based on their date of joining the institution

* Achieved Output:

1)Placement Prediction Model: The developed model achieved an accuracy rate

of 87%. This deviation is primarily due to the complexity of factors influencing

student placements.

2)The project successfully calculated students' expected graduation years based

on their date of joining and the standard program duration (4 years), meeting

the targeted output.

* Reason for Deviation:

1)The deviation is primarily due to the complexity of factors influencing student

Placements

2) There was no deviation in this aspect of the project(Graduation calculation

system) since the targeted output aligned with the achieved result. The

calculation based on the date of joining and program duration was executed as

planned, providing accurate graduation year estimates.

# **CONCLUSION**

* Conclusion:

In conclusion, this project has successfully developed predictive models for

student placement and graduation year, contributing to the enhancement of

academic and career outcomes for students. The models have demonstrated

their potential in guiding resource allocation and providing timely support.

Consideration of assumptions, risks, and constraints has been integral to the

project's success. As we move forward, the future scope includes further model

refinement, real-time predictions, early warning systems, data enrichment, model

interpretability, scalability improvements, deployment integration, and cross-

institutional applications. These endeavors aim to maximize the positive impact

on student success and support the institution's educational goals.

* Future scope:

Looking ahead, there are several promising avenues for the future

development and application of our predictive models. Firstly, we aim to refine

our models continuously, striving for even higher accuracy and robustness. Real-

time predictions are an exciting prospect, enabling immediate support for

students when it's needed most. We also intend to implement early warning

systems that can identify students at risk of delayed graduation or placement

challenges and trigger proactive interventions. Incorporating additional data

sources, such as student engagement metrics and course feedback, could

further enhance the accuracy of our predictions. To make our models more

interpretable, we plan to explore techniques that shed light on the factors driving

our predictions, facilitating more targeted support. Additionally, addressing

deploy our models within our institution's systems, streamlining decision-making

where our models' success could benefit other educational institutions and lead

allocation.

# **APPENDICES**

## Appendix A – Title

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