Comparative Analysis for Master's Degree Programs:Cost and Optimal College Selection

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ABSTRACT

This paper presents a platform that provides end to end data on all master's program their expenses, Average ROI ,best case scenario, worst case scenario through open source information continuously gather and update information in real time .The implementation details including the hardware setup, software programming and testing and procedures are described. The results demonstrate the successful creation of platform that could be utilized to provide a complete information about college ,courses ,fees structure ,ROI, average placement package ,time of graduation of individual from said college ,time of joining company.

Keyword – *Master's Next ,Masters program ,Average ROI, Higher Education ,Comparison and analytics*

1. INTRODUCTION

A postgraduate degree that enables students to pursue advanced knowledge and abilities in a particular field of study is a master's studies programme. It typically takes two years to complete and the eligibility requirement in India is a bachelor's degree in a relevant field. Due to the abundance of information available online, selecting an institution for further education can be a daunting endeavor. We are developing a platform that provides a comprehensive, end-to-end solution for all master's programmes in order to address this issue. A platform that compares master's programmes at universities in India and the USA can provide a range of features and advantages to aid students in making wise and certain judgements. Additionally, one can obtain a comprehensive understanding of the

1.2 Purpose

The goal is to give students a thorough roadmap for their college experience, from picking the best university to receiving their degree. This manual will contain all pertinent details about the college, its setting, the cost of living, and more. The objective is to develop a one-stop shop for students who want to earn master's degrees in their chosen fields. This platform has the potential to be extremely helpful for students by giving them a quick and simple way to access important information without having to search through numerous sources or websites and programmes that a student wants to pursue, as well as by being able to help them make educated decisions when it comes time to choose which college they should attend after graduation.

2. LITERATURE SURVEY

2.1 A Web-Based Decision Support System for Selecting a Master's Program

S. S. S. Ranasinghe proposed a web-based tool for making decisions that aids potential students in choosing the best master's programme for them based on their preferences and qualifications. It employs a fuzzy inference system and

a multi-criteria decision making process to rank the programmes that are available and make suggestions to the users. It provides a case study of the system's use in Sri Lanka and discusses the design and deployment of the system. It also outlines some upcoming work and enhancements and assesses the system's functionality and usefulness. It uses a variety of criteria, including accuracy, precision, recall, F-measure, and user satisfaction, to assess the system's functionality and usefulness. It talks about some upcoming development and enhancements for the system, like adding more criteria, taking user comments into account, and broadening the system's reach.

2.2 A Review on Data Mining and Machine Learning Methods for Student Scholarship Prediction

Varghese K M. JanarthananPillai used data mining and machine learning to predict academic performance. Additionally, it includes a brief explanation of ML/DM, which are tools utilised by researchers. Additionally, it says that data sets are crucial to ML/DM methodology. The IT industry is where machine learning is growing most quickly. These days, data mining and machine learning are strong techniques that may be used in a variety of industries, including IT, the education sector, and business. The use of all these techniques addresses the various ML/DM algorithm types. The more accurate algorithms, such Naive Bayes, Decision Trees, and k-NN, enable the detection of the continuity of each student's scholarship. A list of applicants who deserve consideration will be provided by the suggested model.

2.3 An INTRANET-Based Web Application for College Management System Using Python with Django Web Framework

D.T Koncha and team discusses that gives information to all levels of management within a college using the intranet-based web application TECH-STAT-VIEW (TSV). Python, HTML, Django, and SQLite are the project's primary technologies. The online application has a user-friendly interface, data security, and user authentication. The goal of the paper is to illustrate how a college management system that satisfies the requirements of existing educational institutions may be developed using the Python programming language and the Django framework. Benefits of the online application include user authentication, data security, and a user-friendly interface; drawbacks include the lack of a clear comparison or evaluation of the web application with other similar frameworks or apps.

2.4 UNO: A Web Application using Django

A.K Singh shows how to utilise the Django framework to build a web application that can connect many types of knowledge beneficiaries. Additionally, the paper demonstrates how to use Bootstrap to make the web application user-friendly and responsive.It is a popular option for web development because it provides a number of benefits, including community support, documentation, security, and versatility, as well as speed and scalability. The Model-View-Template (MVT) architecture, used by the Django framework, divides a web application's data, logic, and presentation levels.The advantages demonstrate how to leverage a web page's features to deliver knowledge from a variety of knowledge fields, such as travel, information sciences, technological breakthroughs, politics, etc.Its shortcomings include the inability to clearly compare or rate the college.

2.5 A Web-Based Decision Support System based on Collaborative Filtering for Academic Orientation

Emilio J. Castellano proposed brand-new web-based decision assistance system that aids potential students in choosing an appropriate master's programme based on their preferences and qualifications has been proposed. It employs a collaborative filtering method that assesses the profiles and evaluations of prior enrollees in various programmes and then calculates pertinent data to help their decisions about their academic future. There is a dearth of advice and information for students who desire to continue further education overseas, thus it gives a case study of the system's implementation in different secondary and high schools in Spain. It talks about some upcoming development and enhancements for the system, like adding more criteria, taking user comments into account, and extending the system's reach to other nations and programmes.

3 .REQUIREMENTS

A. Hardware requirements :

A Computer System with ,

- Processor: Minimum 1 GHz; Recommended 2 GHz or more.
- Ethernet connection (LAN) OR a wireless adapter (Wi-Fi).
- Memory (RAM): Minimum 1 GB; Recommended 4 GB or above.
- Hard Disk :500 GB

B. Software Requirements

Because it provides many benefits and features for web developers, Visual Studio is utilized for platform development. It has a sizable and vibrant community and is free. It provides consistent updates, an easy-to-use interface, and simple plugin installation.ASP.NET, JavaScript, Node.js, Python, and other languages and technologies are among those it supports. It has contemporary web tools like cloud scale3, web frameworks, package management, and software containers. Powerful debugger, tester, and deployer tools are included.The Fig-1 represents the IDE for the Visual Studio.

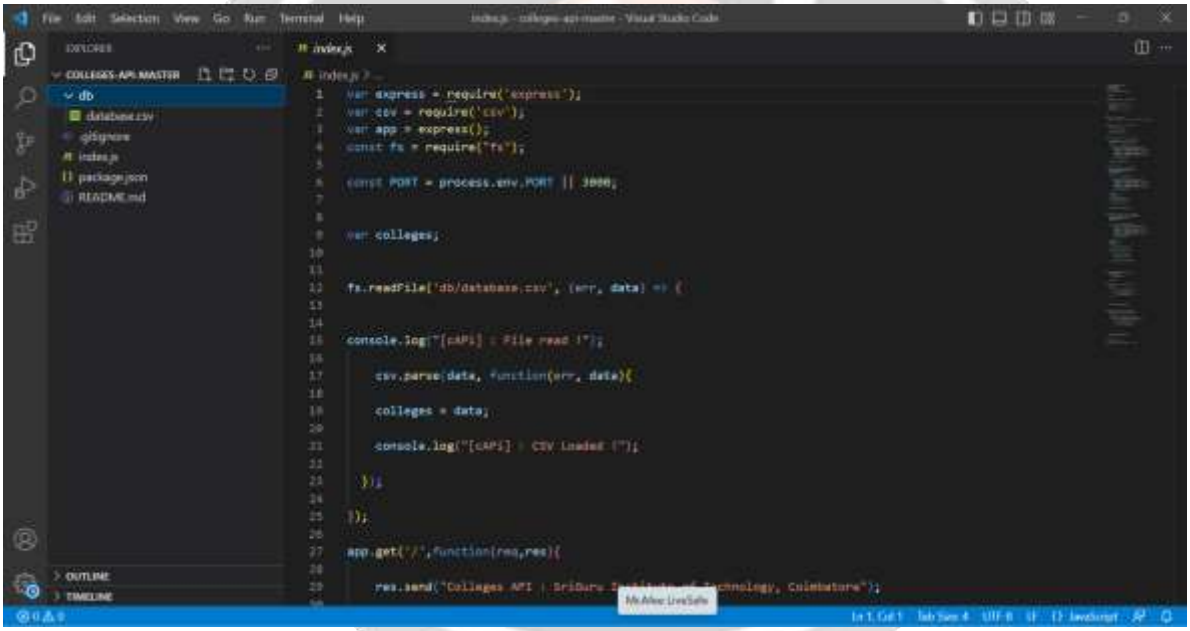

Fig -1: Visual Studio IDE

Some of the software tools that have been used in the development of the platform are as follows :

- **React Js -**React JS is a JavaScript library for building user interfaces based on components. It is fast, scalable, simple, and flexible. It has a lot of support and resources from Meta and the developer community.
- **Django -**Django is a Python web framework that enables rapid and secure web development. It is free, open source, fast, scalable, simple, that provides a framework and simplifies the creation of complex, database-driven websites.
- **Next.Js** - Next.js is a React framework that enables us to create full-stack web applications with features such as server-side rendering, static site generation, data fetching, and routing. It allows to write less code, render pages faster, and fetch data easily.

- **Tail Wind CSS -** Tailwind CSS is a utility-first CSS framework that simplifies the creation of custom designs without writing any CSS. It allows to write less code, style faster, and customize easily.
- **Python 3 -** Python is an interpreted, high-level and general-purpose programming language. Python's design philosophy emphasizes code readability with its notable use of significant whitespace.

4. CONCEPTUAL MODELLING

Using real-world concepts, conceptual analysis modeling creates an abstract model. Understanding and communicating a system's or problem's main features and connections is helpful. It very well may be utilized for different applications in various areas. A use case outline at its least complex is a portrayal of a client's communication with the framework that shows the connection between the client and the different use cases in which the client is involved. A utilization case graph can recognize the various kinds of clients of a framework and the different use cases and will frequently be joined by different sorts of charts too.The following Fig – 2 shows the use case diagram of the model proposed.

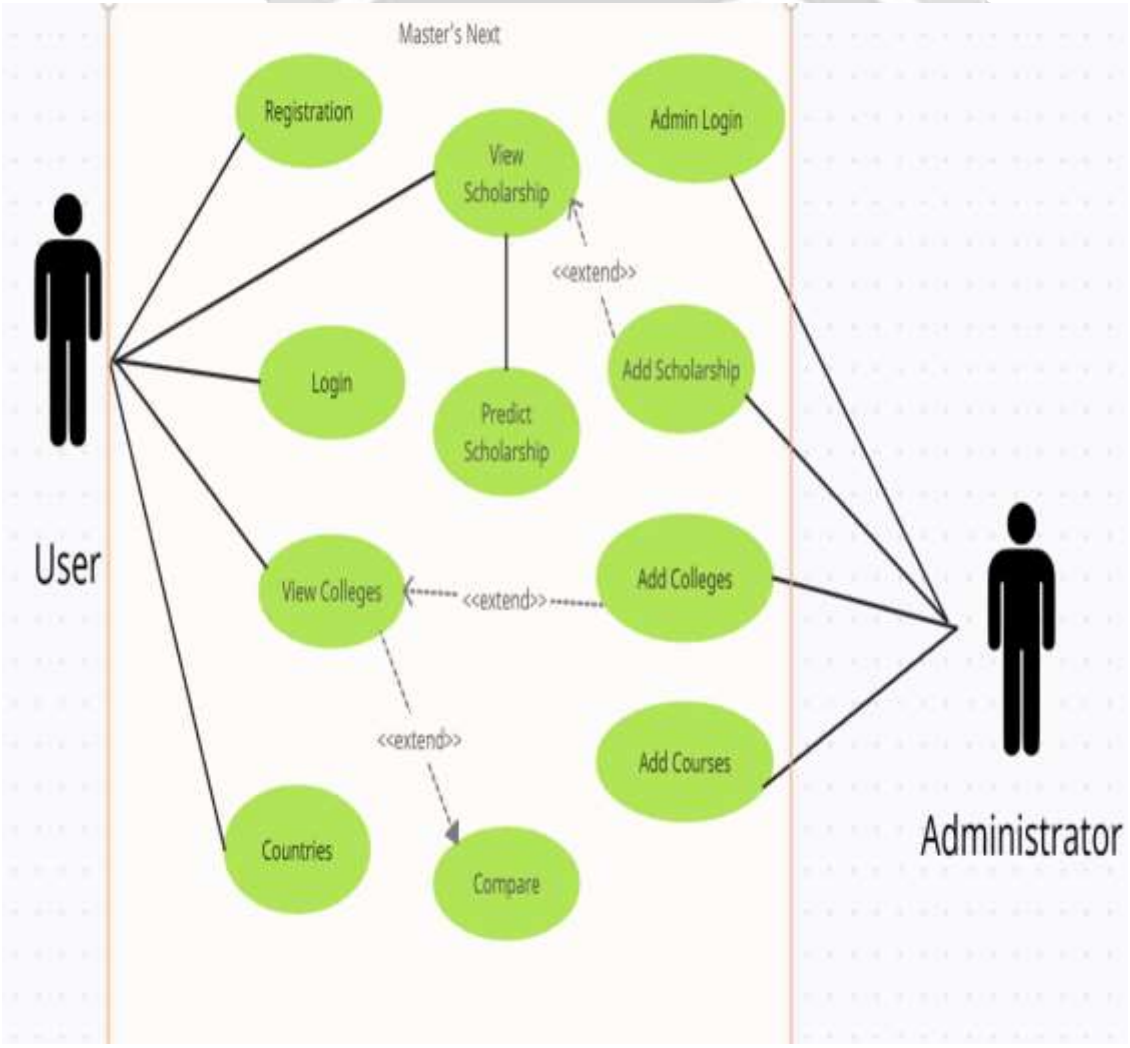

Fig -2 Use Case Model for Master's Next

4. SYSTEM ARCHITECTURE

The process of establishing the architecture, parts, and interfaces of a system that satisfies the platform's requirements is the system design. It entails developing a thorough strategy for the system's implementation, taking into account the technology selection, data model, interface design, and performance optimization . The conceptual model that defines the structure, behavior, and views of a system and its components are shown below in Fig -3

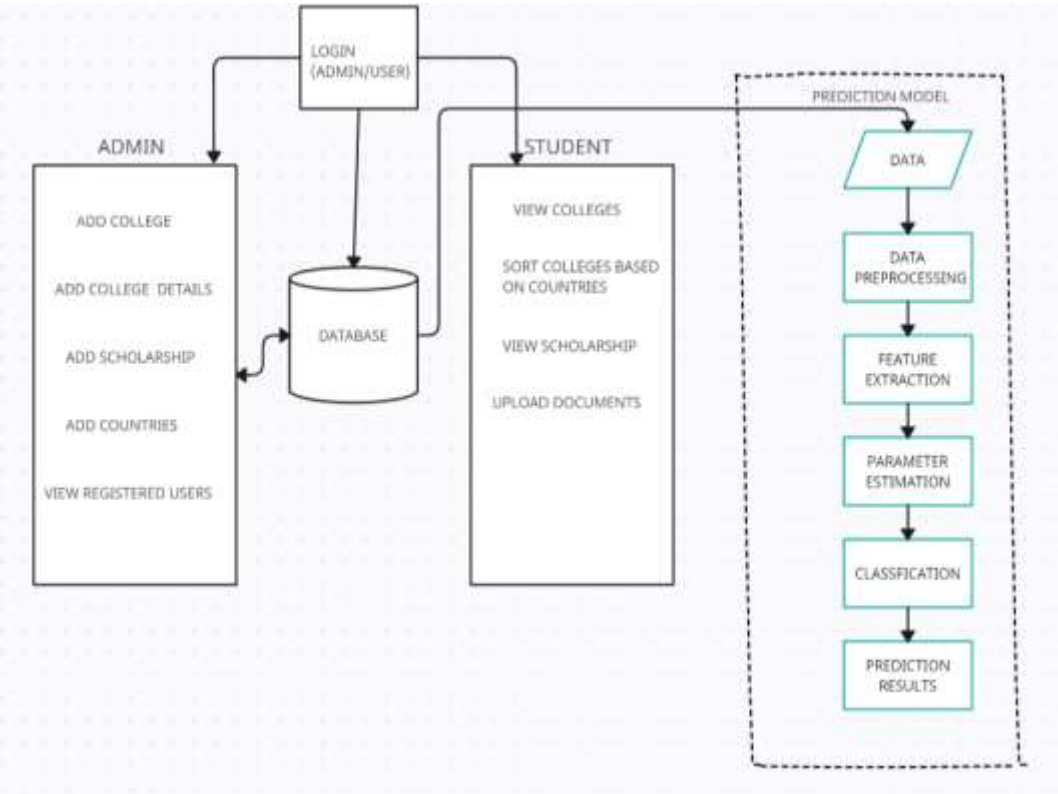

Fig -3: System Architecture for Master's Next .

The features of the architecture are :

- **Login** - This module's section on login covers both the admin's perspective, which lets us administer the programme and decide who may access it, and the user's perspective, which lets users access the application and enjoy its features.
- **Database** - This module's database contains all of the colleges' metadata as well as other information provided by the admin. For application-related purposes, that is accessible.
- **Admin** - This module often has the authorized access to admin who eventually deals with addition, deletion, change of college availability, their courses, their expenses, and average placement package. Also added is the option to add scholarships to the database, which adds the available scholarships.
- **Student** - This module often caters to our future customers who can quickly explore colleges not only in India but also in other nations and obtain a comparative analysis based on a number of different criteria. The projection of scholarships was made possible by the uploading of papers and other information. Additionally, depending on ROI and cost effectiveness, the user may receive the best case and worst case scenarios for the institutions.

- **Prediction Model** - The information from the database is fed into this module to assist students in finding and applying for scholarships that fit their profiles and interests. In order to forecast the outcomes, the data is categorised after pre-processing, extraction, and estimate.

5. IMPLEMENTATION

We have investigated a number of models that are currently in use that would be appropriate for creating our solution. We developed the use of an API to get and scrape college websites in order to collect data on costs and other academic information.In addition to providing information on colleges and their specifics, courses, course fees, average placement packages, and the times at which graduates from such colleges graduate are also gathered.

In light of this, the following implementation strategy for comparing colleges based on ROI, average placement package, and living expenditures in India and the USA might be used:

- Establish your criteria and goals for evaluating institutions, including your chosen course, location, spending limit, and professional ambitions.
- Gather and pre-process data on different elements of institutions, such as fees, placements, scholarships, facilities, etc., from reputable sources such as official websites, rankings, surveys, etc.

The following approaches have been used to do the study:

- ROI analysis, which works by dividing the average placement package by the total fees to determine a college's return on investment.
- Cost-benefit analysis contrasts the costs and advantages of a college by taking into account things like living expenditures, educational quality, potential job paths, etc.

5.1 ROI Calculation

Comparing the expenses and advantages of going to college is how ROI analysis determines the worth of a college degree. The following are a few of the steps in a ROI analysis for colleges:

- Estimate the expenses associated with attending college, such as tuition, fees, books, supplies, housing and board, travel, and other costs.
- Calculate a college graduate's expected earnings depending on his or her major, amount of education, and intended employment.
- The net benefit of a college degree may be calculated by deducting the cost of education from expected future earnings.
- The ROI % is calculated by dividing the net benefit by the cost of attendance.
- Make an informed choice by comparing the ROI % with that of other institutions or non-college options.

The formula used is **: ROI = (Net benefit / Cost) x 100%**

Where : Net benefit = Future earnings - Cost of college.

Cost of college = Tuition + Fees + Books + Supplies + Room and board Transportation + Opportunity cost.

Future earnings = Average placement package x Number of years worked

When a college degree has the highest possible net value and the lowest possible cost, the ROI analysis for universities performs best. This indicates that the college has a good completion rate, a reasonable tuition charge, and a high average placement package. When a college degree has the lowest conceivable net return and the greatest possible expense, the ROI analysis for universities is at its worst. This indicates that the college has a poor completion rate, a high tuition cost, and a low average placement package.

5.2 Cost Effectiveness Ratio

In order to compare the advantages and disadvantages of various universities or programmes, cost-benefit analysis is a technique that uses a standard indicator of effectiveness, such as test scores, graduation rates, or job outcomes. Several elements can impact how cost-effective a college or programme is, including:

- The discount rate used to adjust future costs and benefits to reflect their current worth.
- The accuracy and dependability of the data sources utilised to calculate costs and effectiveness.
- The variety and unpredictability of the target population and their reactions to various options.
- The inflation rate and exchange rate utilised to adjust costs and benefits in various currencies or time periods.

The formula for calculating cost effectiveness ratio is :

FORMULA : Cost effectiveness ratio = Cost / Effectiveness

where: Cost = Total cost of attending college or program

Effectiveness = Outcome indicator of college or program

The college or programme that offers the maximum benefit at the lowest cost is the ideal situation for cost-benefit analyses of educational institutions. This indicates that the college or programme has a cheap cost (tuition, fees, books, supplies, etc.) and a high success indicator, such as test scores, graduation rates, or job outcomes. The situation in which a college or programme has the lowest benefit and highest expense is the worst case scenario for cost-effective analysis for colleges. This indicates that the programme or college has a high cost and a low result indication.

6.RESULTS

The platform provides a one stop solution for all master's programs for all the students who wish to seek higher education in a hassle free process. In order to do the testing, a variety of frameworks and tools were used. The platform's functionality, performance, usability, security, and interoperability were just a few of the features that were tested. Students who wish to research and weigh their alternatives may find it helpful and handy to utilise a platform that compares universities for masters studies in India and the United States. A platform that compares master's programmes at universities in India and the USA can give a range of features and advantages to aid students in making wise and certain judgements.The likelihood of receiving a scholarship to pay for their education is a common concern among students who desire to pursue a master's degree in the USA or India. The research also offers tips and proposals for expanding the platform's functionality and quality.

7.CONCLUSION

Master's Next can help students and their families make informed decisions about their higher education options. By comparing different colleges based on their average ROI, cost benefits, and placement, students can find the best value for their money and career goals. ROI or Return on Investment is a measure of how much a student earns after completing a course versus the amount they spend in completing the course. Cost benefits include factors such as tuition fees, scholarships, loans, and living expenses. It can provide data and analysis on these aspects for various colleges and courses in India and abroad. The platform can help students find the best fit for their interests, skills, budget, and aspirations.

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