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Integrated Information Platform for Information about Indian Universities

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Abstract: Finding the right university has always been a challenging task as it involves considering various factors such as location, tuition fees, courses offered, facilities provided, and placement ratios, among others. This process is often complex and time-consuming. To simplify this process, we propose an Integrated Platform for Information about Indian Universities that provides comprehensive information to assist individuals in making informed decisions about their future career. This platform makes it easier for students to find a university that aligns with their personal interests and academic profile and provides them with relevant information.
Keywords: University website, Indian universities, University finder, Web application, University information portal.

I. INTRODUCTION

The development of university applications is influenced by ongoing education reforms and the adoption of various courses and degrees by students.

To address these changes, new systems such as e-learning systems, course evaluation software, and other proprietary developments have been introduced. The increasing requirements to combine data throughout the whole university or department and to extract information for the university has led to the need for an integrated university information platform that improves communication between students and management.

In the past, finding appropriate universities within a limited time frame was a challenging process that required consideration of various aspects such as offered courses, fees, cut-offs, and general information. To simplify this process, an integrated information platform for Indian universities is being developed that allows users to search for and filter universities based on their preferences. The information system uses data provided by the user on their profile, which mainly consists of academic data. Users can add specific universities to their wish-list and view career options available to them. The fully functional website is programmed in JAVA language, and data is stored in a MySQL database. Additionally, HTML, CSS, and JavaScript are used for the frontend.

II. LITERATURE SURVEY

To successfully plan a website, web designers can take two approaches: determining goals and resources needed to achieve them or specifying the target audience, site details, necessary technology, and studying results. When creating a university information website, designers must understand the needs of two types of audiences: academic students and other people and institutions. Unfortunately, evidence shows that many universities have failed to meet students' search requirements, with the average student spending only 8 seconds on a website before leaving.

Existing university search systems have several flaws, including manual searching, limited exposure to information, and outdated data. Some studies have proposed solutions such as a tailored search engine with relevant information about courses, faculty research, and events; improving search algorithms and user interface design; incorporating metadata modelling; and using machine learning and natural language processing techniques. However, existing systems lack a recommendation mechanism to help students find the best universities based on their educational backgrounds.

Data redundancy is another issue, as it wastes space and can cause inconsistent data. In addition, browser compatibility issues, difficult and time-consuming searching, and incomplete information present further problems. Improving university search engines with better algorithms, metadata modelling, and user interfaces, as well as incorporating machine learning and natural language processing techniques, could help students find the right university more easily.[1]

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Some evaluations based on the existing platforms are as follows,

The university search engine that is presented in the paper incorporates various features that are customized to meet the specific requirements of university students, staff, and faculty members. The search engine provides reliable and relevant information about the university, including details about courses, faculty research interests, and events [2].

The effectiveness of university search engines in providing accurate and relevant search results is examined in the paper. The authors conclude that while university information platforms are generally effective, there is still scope for improvement in terms of searching algorithms and user interface design [3].

In the given paper, the authors propose a metadata model for university search engines that can retrieve and present relevant information to users effectively. According to the authors, metadata is an important factor in improving the accuracy and relevance of search results [4].

The application of machine learning techniques to improve the performance of university search engines is explored in the paper. The authors demonstrate that machine learning can effectively enhance search accuracy and relevance [5].

The paper presents a university search engine that has natural language processing capabilities, enabling users to search for information using natural language queries. The authors demonstrate that this approach can enhance user satisfaction and search accuracy [6].

To make it easier for students to find universities they can apply to and have a chance of being accepted, a portal is necessary. This system analyses the user's educational background and generates a list of suitable universities. However, data redundancy is an issue that needs immediate attention since it wastes space and can cause inconsistent data if not updated properly.

Aside from data redundancy, the existing system also has problems with browser compatibility and search functionality, and it lacks various essential information in a university information tool. Despite these issues, university search engines are crucial in providing reliable and relevant information to students, faculty, and staff. There is still room for improvement in terms of search algorithms, metadata modelling, and user interface design. The incorporation of machine learning and natural language processing can also enhance the accuracy and relevance of search results.[7]

III. PROPOSED STATEMENT

Given the problem statement, we have proposed a solution to assist students in obtaining comprehensive information about universities of their interest. We intend to develop a web application that utilizes HTML, CSS, and JavaScript for the frontend and Java and MySQL for the backend and database. The application will feature an interactive GUI for user interaction. As a result, our proposed system will provide students with more accurate and relevant university information.

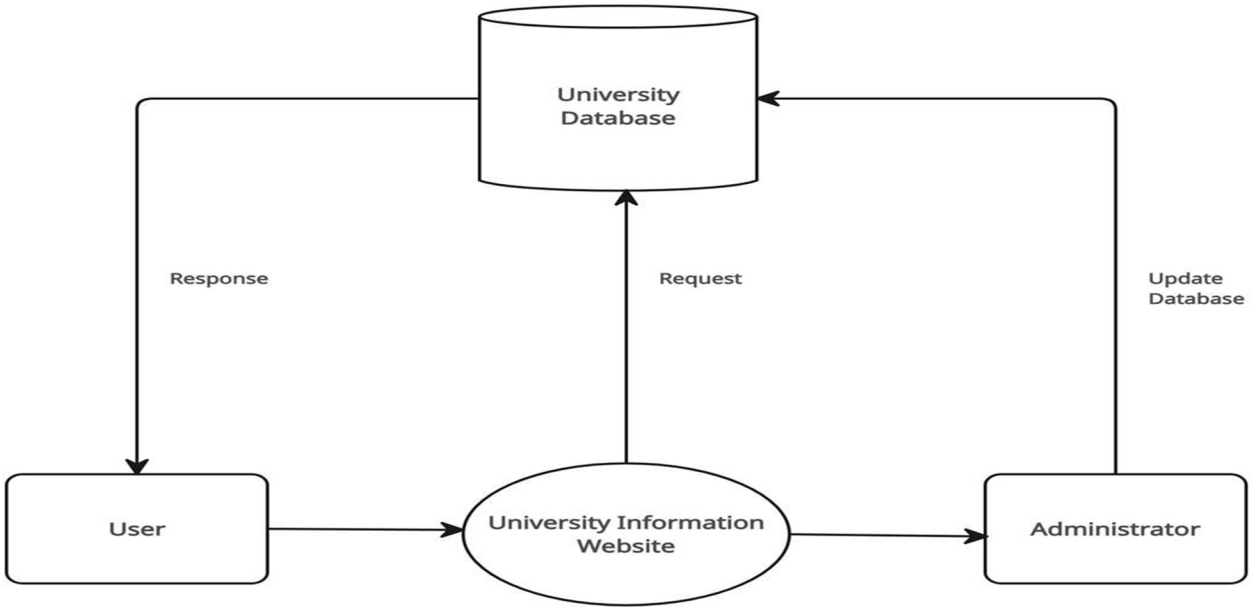


Fig. 1 System Architecture of Indian Universities Information Portal

The proposed web-based platform aimed at providing information about Indian universities will comprise various features. The university search functionality will enable users to look for specific courses offered by universities, while the faculty search will allow users to find faculty members based on their name, department or research area.

Additionally, the facility search will provide information about the different facilities available at universities, including libraries, labs, and sports facilities. The location-based search will allow users to search for universities based on their location, including city, state or country. Admission requirements, cost and financial aid information features will provide information about the admission process, tuition fees, and financial aid options at universities. Moreover, personalized recommendations feature will use user preferences such as program interests, location, and budget constraints to offer customized university recommendations that match the user's requirements.

IV. METHODOLOGY

A. Login User Dashboard

Users can create an account or log-in to the web portal. After logging in, users are directed to their dashboard, where they can view their profile information and customize their search preferences. Users can also access their saved searches, bookmarked universities, or courses, and receive personalized recommendations based on their preferences.

B. Admin Dashboard

Admin can login to the portal to upgrade the website. Admin can manipulate the database according to the needs and requirements of the user. Admin can update the portal and can add and delete the information. What to display on the site is in the hands of Admin.

C. Search University

Users can enter search criteria, such as keywords, location, course, faculty, or facility, in the search bar. The pattern matching algorithm implemented in Java processes the search query and retrieves relevant university information from the database. The search results are displayed on the user's dashboard or a search results page, showing universities that match the search criteria. Users can view detailed information about each university, such as programs offered, faculty information, facilities, admission requirements, and cost and financial aid information.

D. Show Results

Users can select a course of interest and view the detailed information about the program, including admission requirements, tuition fees, and financial aid options. Users can also view additional information, such as faculty profiles, facilities available, and location details. Users can bookmark or save the program for future reference or further evaluation. Users can contact the university for more information or apply for the program directly through the platform, if available. Users can also provide feedback or ratings for the programs or universities they have explored.

E. Show detailed information about the University

Users can view the details of the university on the individual page provided for each university. This page has all the necessary information about the university that is required. User can also compare between universities of their choices.

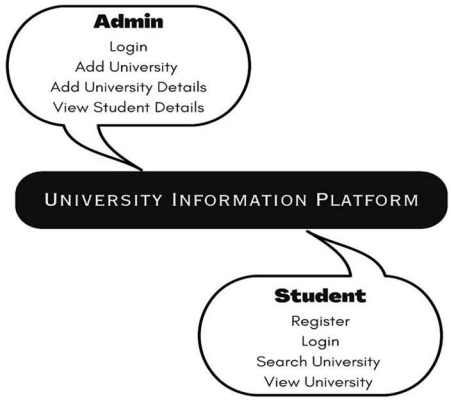


Fig. 2 System Methodology

V. ALGORITHM USED

A. Knuth-Morris-Pratt (KMP) Algorithm

The Knuth-Morris-Pratt (KMP) algorithm is a pattern matching algorithm used to search for occurrences of a given pattern in a longer text. It is efficient in terms of time complexity, as it has a linear time complexity of O(n + m), where n is the length of the text and m is the length of the pattern. The KMP algorithm avoids redundant comparisons by utilizing the information from previously matched characters in the pattern, which makes it more efficient compared to other naive pattern matching algorithms.

Here's a high-level overview of the KMP algorithm:

1) *Preprocess the Pattern:* Generate a prefix table (also known as the "lps" or "longest proper prefix which is also suffix" array) for the pattern. This table stores the length of the longest proper prefix that is also a suffix for each prefix of the pattern. It is computed in a linear time complexity of O(m), where m is the length of the pattern.
2) *Search for the Pattern:* Iterate through the text from left to right, comparing characters of the text with characters of the pattern. If a mismatch occurs, use the information from the prefix table to determine the next character to be compared in the pattern, instead of starting from the beginning of the pattern. This avoids redundant comparisons and makes the algorithm more efficient.
3) *Handle Matches:* If a match is found, handle it according to the requirements of the application. For example, you can store the index of the match, count the number of matches, or perform any other necessary action.
4) *Repeat Until end of Text:* Continue searching for the pattern in the text until the end of the text is reached.
5) *Handle no Match:* If no match is found, the algorithm terminates.

The KMP algorithm is widely used in various applications, including string matching, text processing, and pattern recognition. It is efficient, easy to implement, and can handle large texts and patterns. However, it requires additional preprocessing of the pattern to generate the prefix table, which may add some overhead in terms of memory usage and computation time. Nevertheless, the KMP algorithm is a powerful tool for efficient pattern matching and can be utilized in many practical scenarios.

VI. DATA FLOW DIAGRAM

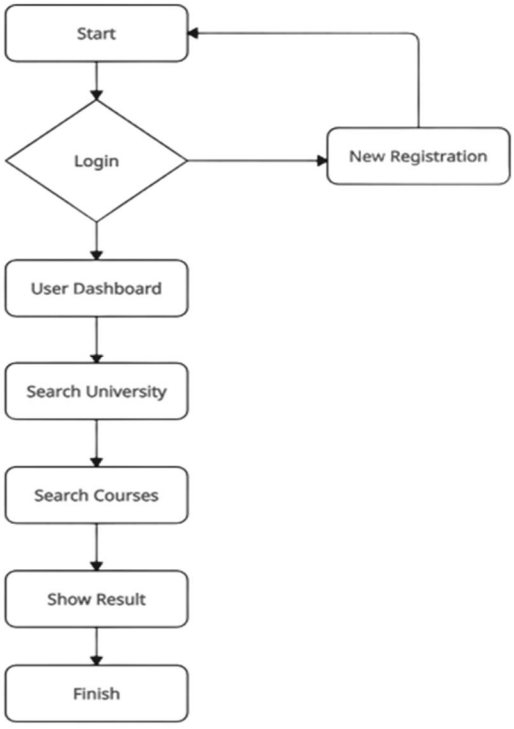


Fig. 3 Data-Flow diagram of web portal

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VII. IMPLEMENTATION

A. Login Page

Users can create an account or log in to the web portal. After logging in, users are directed to their dashboard, where they can view their profile information and customize their search preferences. Users can also access their saved searches, bookmarked universities, or courses, and receive personalized recommendations based on their preferences.

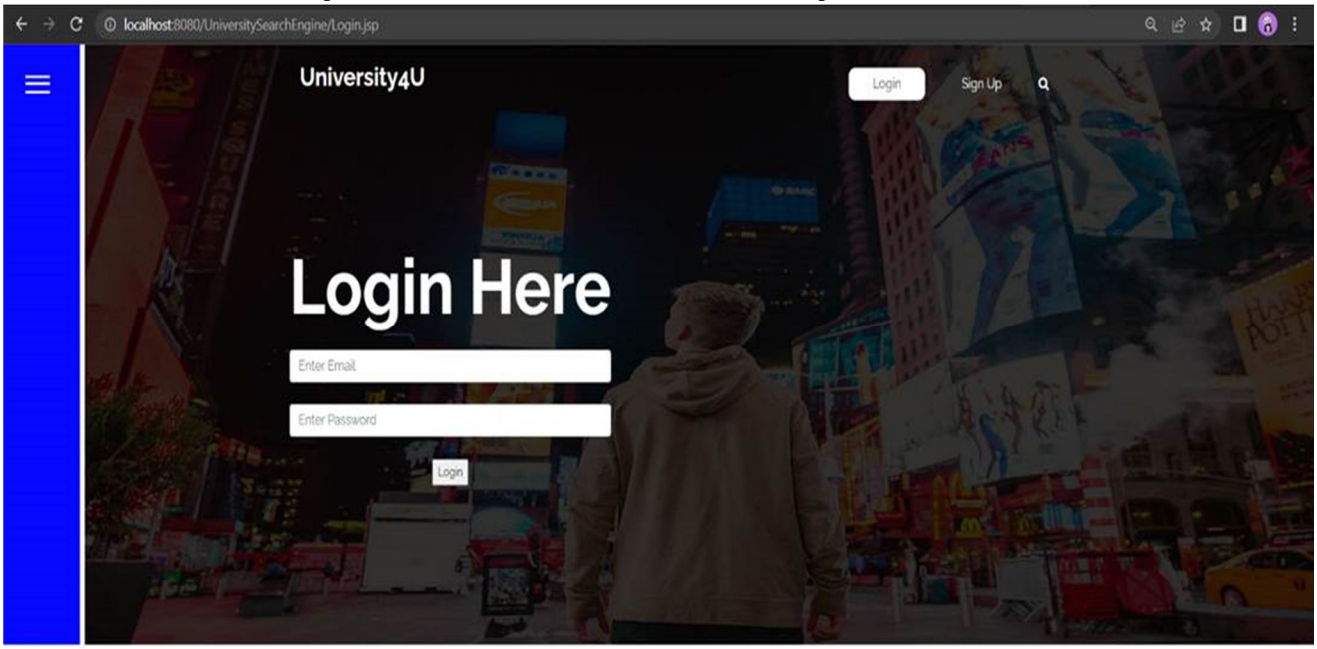


Fig. 4 Log-In Page

B. Registration Page

Users, including admins, would need to fill out a registration form that collects relevant information such as name, email address, password, and any other required details. The registration form may also include additional fields specific to the university search engine, such as the role (user or admin), contact information, and other relevant details. Once the registration process is complete, users and admins can access the university search engine platform using their registered credentials, such as email address and password. They can then log in to their respective user or admin dashboard to access the available features and functionalities.

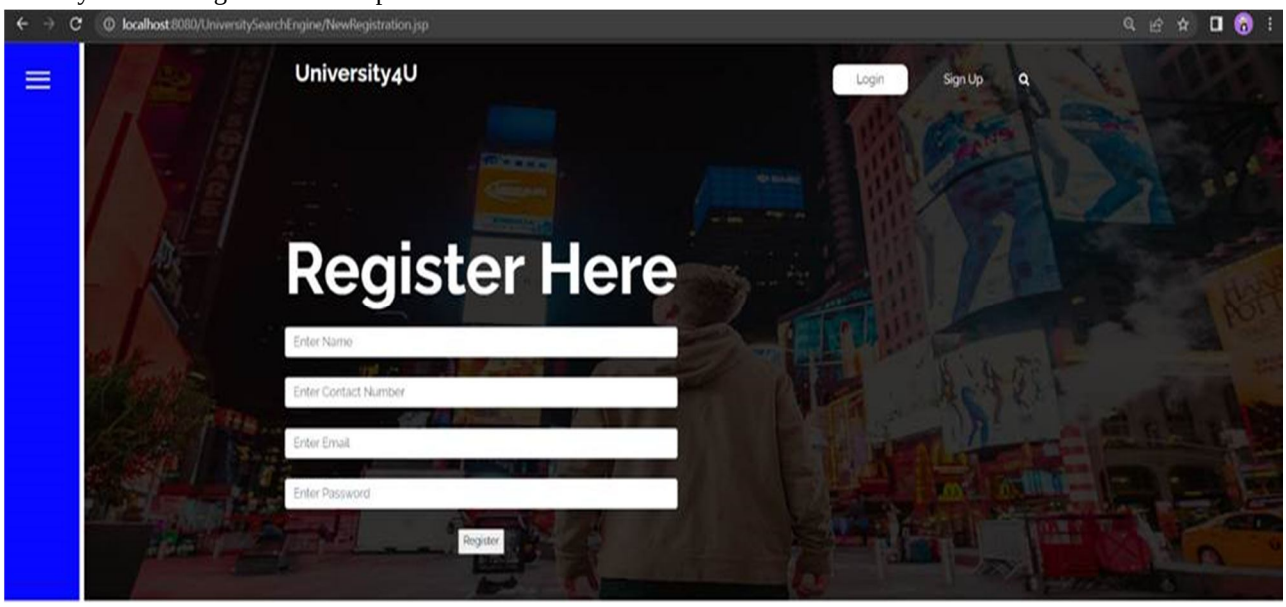


Fig. 5 Registration page

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C. Home Page

The home page of a university search engine would typically serve as the main landing page for users and provide them with an overview of the platform's features and functionalities. The header section typically includes the search bar, where users can enter their search criteria, such as keywords, location, program, faculty, or facility, to start their university search. It includes a login/register button for users to create an account or log in to the platform.

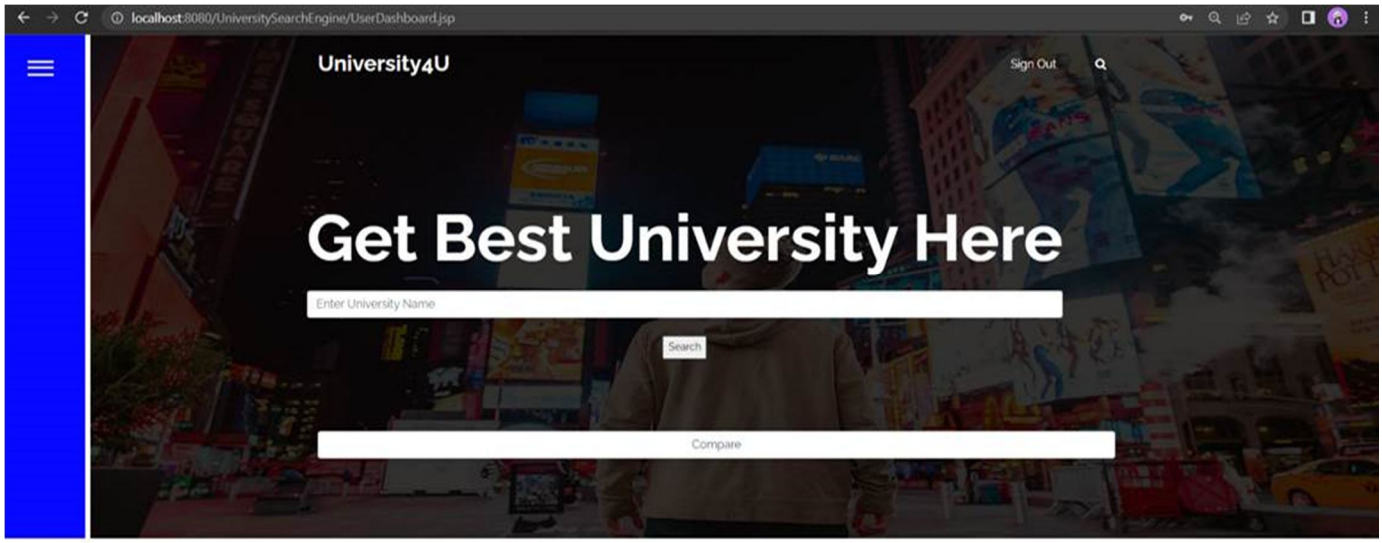


Fig. 6 Home Page

D. Add University Page

Admin can click on the "Add University" button or access the "Add University" module from their dashboard. Admin can enter relevant information about a university, such as university name, location, contact information, programs offered, faculty information, facilities, admission requirements, and other details. The information entered by the admin is processed and stored in the database, creating a new university profile in the search engine platform.

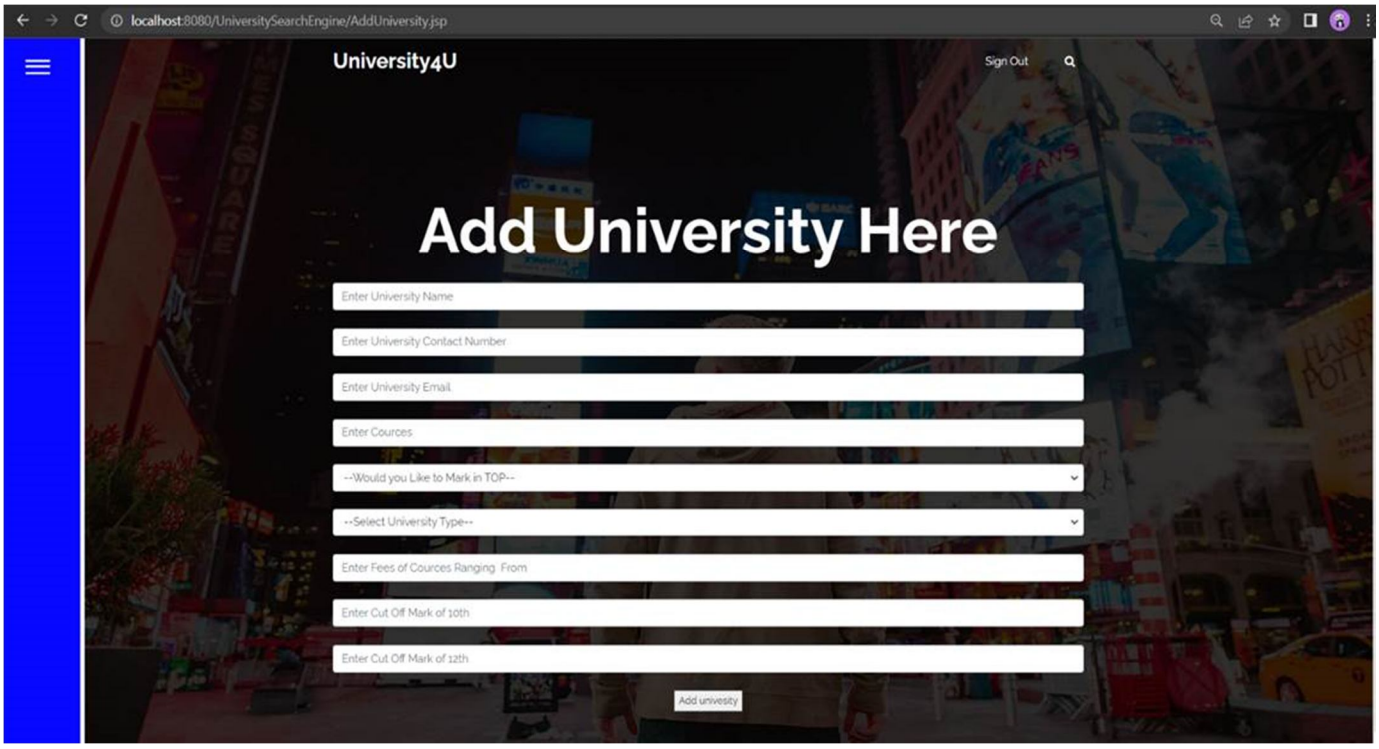


Fig. 7 Add University Page

E. Added University Module

Admins can access the University Module from their dashboard or through a dedicated admin panel. Admins can view a list of universities added to the search engine platform, along with their corresponding information, such as university name, location, contact information, programs offered, faculty information, facilities, and other details. Admins can search for specific universities using filters or keywords to easily locate and manage universities in the system. Admins can add hostel the information of existing universities.

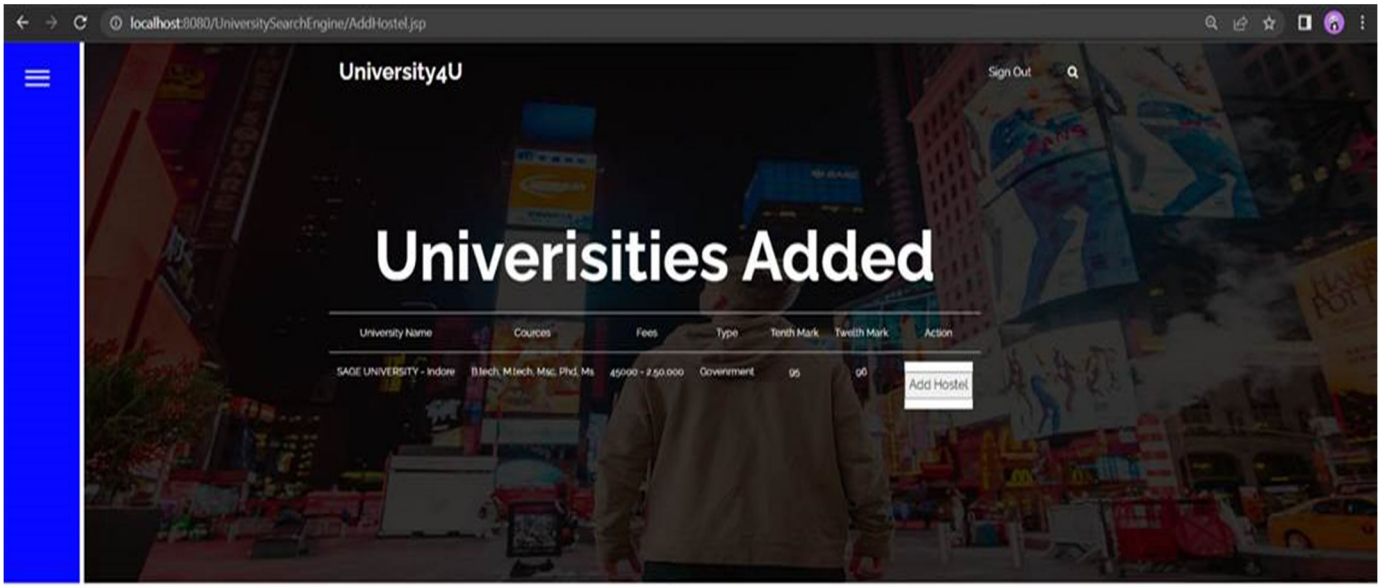


Fig. 8 Universities Added Module

F. Universities Comparison Section

Users can compare two or more universities based on their requirements and then can choose the desired university to enrol themselves in it. The comparison section compares various entities between the selected universities like fees, courses offered, placements, etc. Users can take advantage of this system to obtain various insights.

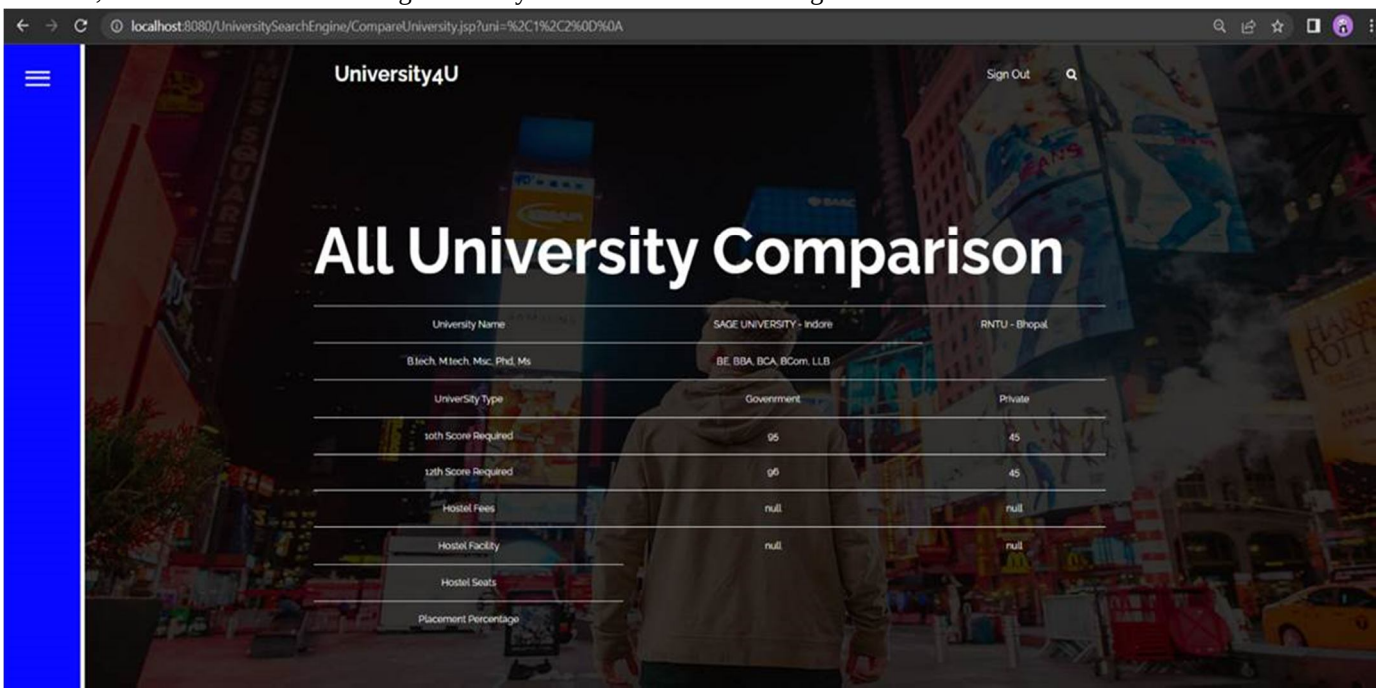


Fig. 9 Comparison Section

G. University Recommender

In this section, the user can find out which universities they are eligible for by entering their 10th and 12th marks. The recommended universities are based on their academic performance.

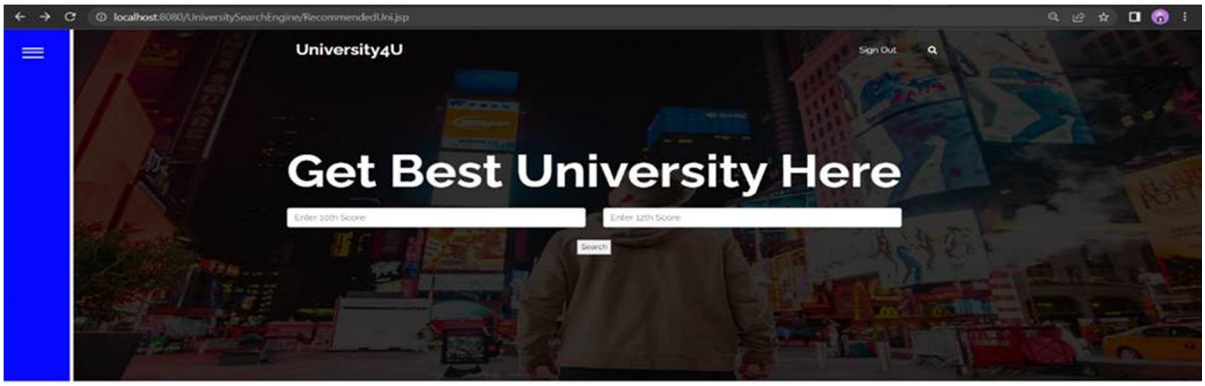


Fig. 10 University Recommender Page

VIII. ACKNOWLEDGEMENT

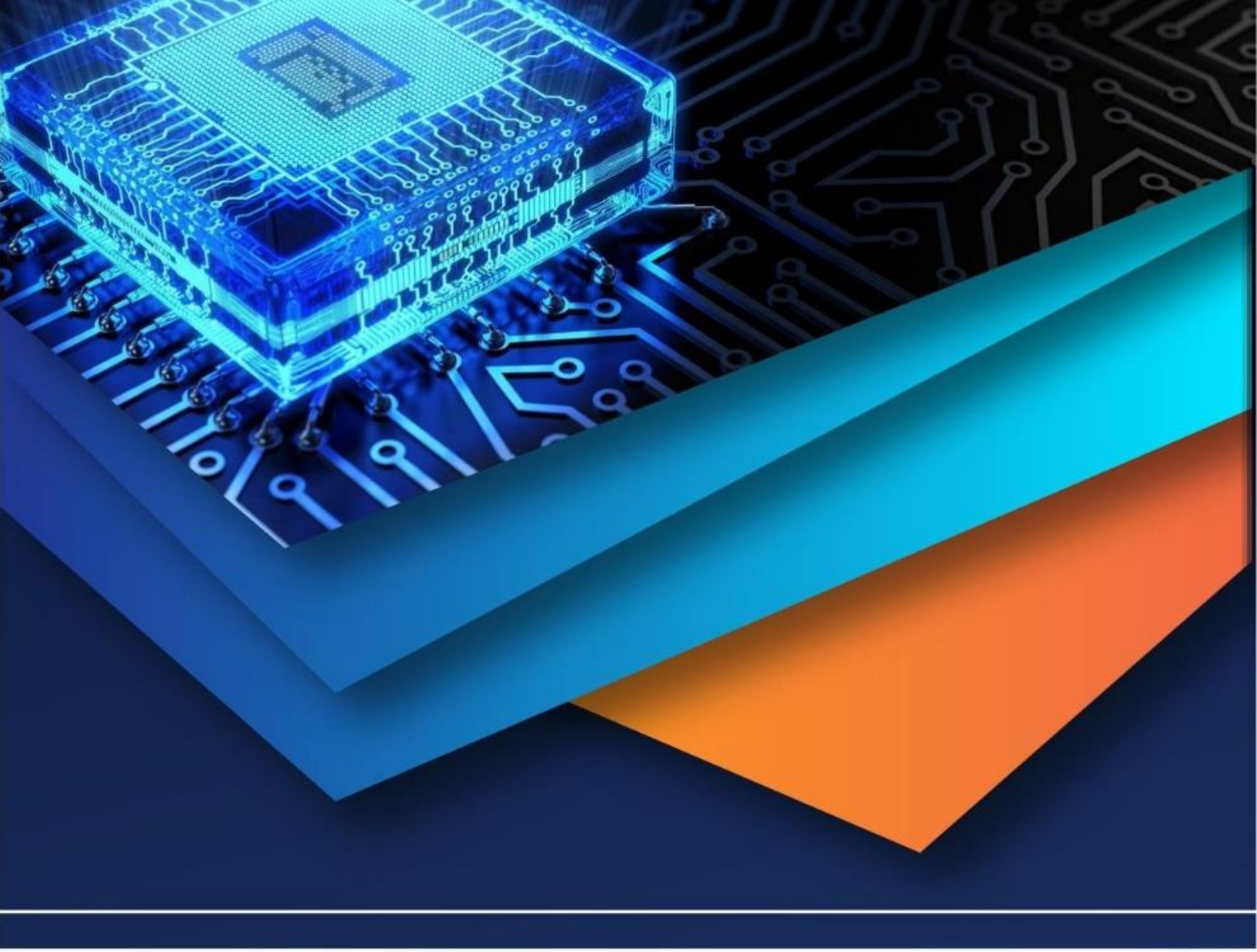
We are thankful to our mentor, coach, and guide Prof. Y. A. Thakare mam. We would like to thank you for this opportunity to present a paper on Integrated Information Platform for Information about Indian Universities (a web-based application).

IX. CONCLUSION

In conclusion, A valuable tool for students, faculty, and administrators in the higher education domain can be an Integrated Platform for Information about Indian Universities. The portal, implemented using Java and based on matching pattern algorithms, can simplify the process of searching for universities, browsing available courses, and retrieving relevant information for users. The platform can offer a secure login and registration system with a user-friendly interface. The matching pattern algorithms can ensure efficient and accurate search results based on criteria such as location and course preferences.

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