

Web Application to Reduce Time for Searching Colleges in India

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Abstract— The paper involves a process of building a website which uses web technologies for creating application. The primary task of the application involves development of User Interface(UI) with the help of technology known as REACTJS that makes the website user friendly and reactive. Storing data is a crucial task in developing any website and database technologies used for storing and accessing this data are SQL database provider known as JDBC which provides security, authentic user authorization, storing of large scale of visual and textual data. For a seamless user experience to the end user API METHODS are used to integrate the back-end technologies with front-end technologies. Finally, after the development of application the end users are able to search for various colleges and institution across INDIA to gain information related to colleges, their placement details, infrastructure provided by the colleges and various reviews posted by verified college authorities, student, parents and Guardian. After analysis and comparison of the Colleges the end user can make the best choice for their higher studies and better future.

Index Terms— website, User-Interface, SQL, JDBC, API METHODS, front-end, back-end.

I. INTRODUCTION

Today, website is being used by every individual may it be a kid, a teenager or an adult. [1]. Websites today serve as strong tool of communication and its success depends on its accessibility, SEO (Search Engine Optimization) and usability. The successful implementation, output and its reach to users is determined on the features like Usability (ease-of-use) and accuracy of data provided by the website [1].

In the modern era, in a developing Country Like India choosing the right college and right course for the Youth is a challenging situation as within a short period of time it is difficult to travel the entire country and approach different colleges and choose the best one as it is a tedious job with financial constraints. Owing to this problem, a website named COLLEGEFINDER application is developed where the students, parents and guardians in a short duration can view all the colleges entered in the software in real time and can choose and apply to the colleges according to their need and requirements

The main aim and purpose of users will be to gain a detailed information of colleges present in the country and the users can analyze and select the best college for their career. The website has many features to explore a wide range of colleges present in the country. The main objective is to develop a website which has a huge impact on society involving various web-technologies. The website uses the best technologies available. [2].

II. RELATED WORK

The paper [3] discusses the significance of website design and functionality in creating a positive user experience, emphasizing the importance of website attractiveness and trustworthiness in enhancing user retention and usability. Attractive websites can engage users and increase traffic, while trustworthy websites can make users feel secure. The paper also identifies three dimensions of online trust - competence belief, benevolence belief, and integrity belief - that can help establish credibility with users. By prioritizing these attributes, website owners can increase user retention and maintain trust in their websites.

The paper [4] introduces a novel approach to modeling requirements called Use Processes, which utilizes the Business Process Modeling and Modeling Notation (BPMN) and Use Case Diagrams (UML) of UML v1.5. The paper outlines several methodologies for developing Use Case Diagrams after requirement gathering and how these diagrams can be used for structured website development. Various techniques are employed to create a Use Case Diagram for the project, and the paper also discusses the implementation process, including steps such as analyzing the problem statement, modeling the use case diagram based on the business process, defining system boundaries, describing activities and roles, and identifying system functionality.

The paper [5] presents an overview of React, which is a web framework specifically developed to tackle performance problems in internet applications. React adopts a virtual DOM to determine if a component should be reloaded based on its current state and any modifications made to it, thus avoiding redundant rendering. Furthermore, React introduces unidirectional data flow as a means of regulating data flow in tracking applications. In paper [6], the authors present a comparative analysis of SQL and NoSQL databases in a NodeJS environment, specifically utilizing the NodeJS Fullstack framework, which incorporates NodeJS, ExpressJS, AngularJS, MongoDB, and PostGIS due to its efficient management of Big Data and non-blocking nature. The study focuses on evaluating the time taken to load a large amount of POIs from SQL (PostGIS) and NoSQL (MongoDB) databases in the NodeJS environment. The authors imported POI data, generated using QGIS, into both databases and developed a web application using the MEAN framework (MongoDB, ExpressJS, AngularJS, and NodeJS) to test the performance of loading geospatial data. The paper also summarizes the authors' experience creating a MEAN web application to handle big data with a spatial context, using SQL and NoSQL databases.

The authors of paper [7] propose a solution for the bureau of retired veteran cadres to efficiently manage their information system. The system is developed using the Spring Boot framework, which utilizes the concept of micro service architecture. To enhance the system's capabilities, the authors have integrated Mybits, Redis, and other technologies. This new system addresses the issues of poor maintainability, limited concurrency, and difficult business expansion commonly faced by traditional monolithic architectures. Additionally, it meets the requirements of multi-terminal access, front-end separation, multi-functionality, low coupling, high cohesion, and easy scalability. The micro service architecture improves the system's scalability and reliability. The use of internet technology in the retired veteran cadres bureau's government services can also improve work efficiency by streamlining complex management processes.

In paper [8], the authors delve into the integration of programming language and database when developing web applications, utilizing Servlet and JDBC technologies as an example. The paper showcases the design and implementation of a Management Information System (MIS) for students, with the objective of promoting efficient information sharing and interoperation. The authors explain the B/S (Browser/Server) three-tier architecture and its division into three relatively independent units: the presentation layer, business logic layer, and data service layer. Servlet technology is described as a small program that operates within a web server, handling requests and responses from web clients. The Java Servlet API provides a standard interface between a Servlet server and Java server, resulting in cross-platform server features. The authors also elucidate JDBC technology as a Java API that includes classes and interfaces for implementing SQL statements. JDBC serves three main functions: establishing a connection to a database, sending SQL statements to the database, and handling the result returned from the database.

The paper[9] discusses the importance of protecting sensitive data within web applications and the vulnerabilities that exist, particularly with SQL Injection attacks. The paper explores the use of different security systems such as firewalls and IPS to protect against such attacks. The authors conducted a penetration testing technique to test the effectiveness of the security systems implemented in the government network of Kosovo. The results were compared to a scenario where no security systems were in place. The paper highlights the importance of proper security measures and testing to prevent unauthorized access to sensitive data.

The paper[10] presents the development of a business cloud service platform that utilizes the Spring Boot framework to provide businesses with intelligent and flexible services tailored to their needs. The platform's architecture is described, and its modularity allows for easy addition or removal of services. The authors also

discuss the integration of artificial intelligence in the platform, which enables it to provide intelligent services such as customer service and data analysis. The paper includes a case study that showcases the platform's capabilities in developing a logistics company's cloud-based service. Overall, the paper presents a valuable method for developing intelligent business cloud service platforms to improve business operations and achieve goals.

The paper[11] discusses the significance of query optimization in improving the performance of database systems, especially for larger databases. It introduces various optimization techniques, including indexing, query rewriting, and cost-based optimization, and explains how they can improve query efficiency. The authors present experimental results to support the effectiveness of these methods.

The paper [12] discusses the technologies used in creating social networking sites, with a focus on Facebook. It explains the contrast of front-end and back-end technologies and their roles in developing a functional website. The front-end technologies, which include HTML, CSS, and JavaScript, are responsible for the site's appearance and user interface. Meanwhile, the back-end technologies, such as PHP and MySQL, process data and manage the site's functionality. Overall, the paper provides an overview of the various technologies utilized in the development of social networking sites.

The paper [13] presents a comprehensive guide to building an e-commerce website with a Java EE lightweight framework. It describes the course's structure, including learning objectives, course schedule, and assessment methods. The teaching approach involves a combination of lectures, lab exercises, and project-based learning, with a strong emphasis on hands-on experience in constructing e-commerce websites using the Java EE lightweight framework. The paper stresses the importance of practical learning in this framework, highlighting its significance for e-commerce website development.

In paper [14], the utilization of ReactJS in trading applications is examined. ReactJS is argued to offer a multitude of benefits for trading applications, including faster rendering, simpler state management, and enhanced user experience. The paper offers a comprehensive overview of ReactJS and its features, such as the virtual DOM and reusable components, and outlines how ReactJS can be leveraged in trading applications, including real-time data visualization and dynamic UI updates. The challenges encountered during the development process are also discussed, along with the methods employed to overcome them. Additionally, ReactJS is compared to other front-end frameworks, such as Angular and Vue.js, with the paper highlighting its superior balance between performance and flexibility, making it an optimal choice for trading applications.

III. PROPOSED METHDOLOGY

Since a good user experience can make people think favourably of us, therefore we concentrated on the web application's UI portion so that it would draw in the audience we were trying to reach. According to this research, user engagement and traffic can be increased by appealing websites, whereas user security can be increased by trustworthy websites, therefore in accordance with this study of user interface and with the aid of this study, we created our user interface with all of this in mind.

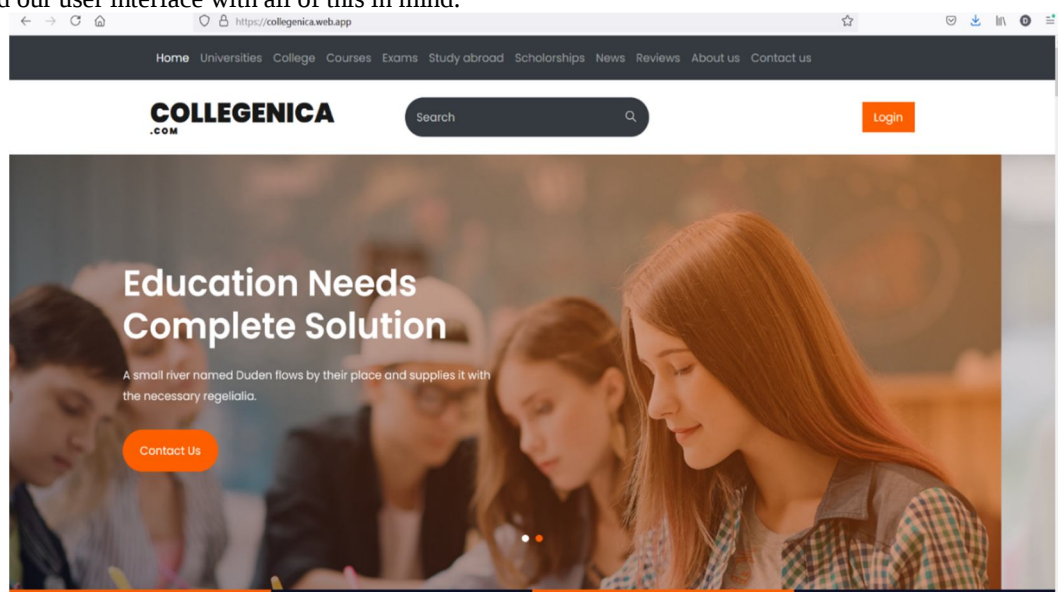


Figure 1 . Home page of collegenica

CD Rank	Colleges	User Reviews	Ranking
#1	Rashttrasant Tukadoji Maharaj Nagpur University Nagpur Maharashtra - 440033 Apply Now Download Brochure Add To Compare	02 Reviews	0
#2	Visvesvaraya National Institute of Technology Nagpur Nagpur Maharashtra - 440010 Apply Now Download Brochure Add To Compare	01 Reviews	0
#3	Government Medical College and Hospital Nagpur Maharashtra - 440003 Apply Now Download Brochure Add To Compare	04 Reviews	0

Figure 2 . Shows different universities by ranking

Given that we are also working on spring, which is essentially a java framework, this has helped us to connect it to mysql server with ease and has also allowed us to do any operations in the database server. The graphic below demonstrates how JDBC connections are made in spring.

```

1  ## YAML Template.
2  ---
3  spring:
4    datasource:
5      driverClassName: com.mysql.cj.jdbc.Driver
6      url: jdbc:mysql://localhost:3306/college_nica_db
7      username: college-manager
8      password: ^LKwTLx4lf3P
9    jpa:
10     hibernate.ddl-auto: update
11     generate-ddl: true
12     show-sql: true
13     properties:
14       hibernate:
15         format_sql: true
  
```

Figure 3 . Shows connection with database

The spring framework is highly helpful for writing queries, inserting them into databases, and many other tasks. we have learned more about the spring framework, as well as what it's used for and how to apply it. Utilising spring is actually a very enjoyable task because it allows you to do so many things with ease, such as creating a database table and joining it with other tables. Spring dependency injection is also a popular design pattern because it removes dependencies from the programming code, making it simpler to manage and test the application.

IV. RESULT AND DISCUSSION

The CollegeNica project has the potential to provide several benefits to students and parents looking for colleges in India. The project's user-friendly platform and comprehensive database of colleges' information could make the college selection process easier and more efficient for users. With real-time information on course availability and seat availability, users can make informed decisions about the colleges they want to apply to. Additionally, the platform's verified reviews from authorities, students, and parents could provide users with valuable insights into the quality of education and college life at different institutions.

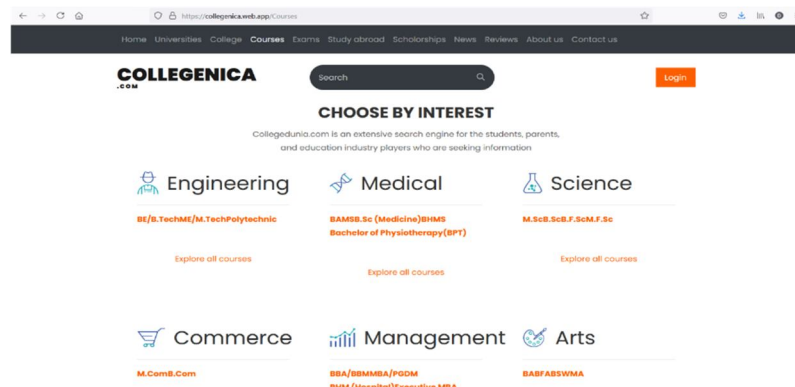


Figure 4 . Shows webpage to search colleges by courses

The College Nica project could have several implications for higher education in India. By providing a centralized and comprehensive database of information on colleges, the project could help promote transparency and accountability in the higher education sector. It could also help bridge the information gap that often exists between colleges and potential students. The project's use of web technologies such as REACTJS and JDBC, along with API methods, could set an example for other initiatives looking to leverage technology to improve education access and quality. However, the project's success could depend on factors such as user adoption, the accuracy of the information provided, and the project's ability to stay up-to-date with changes in the higher education landscape

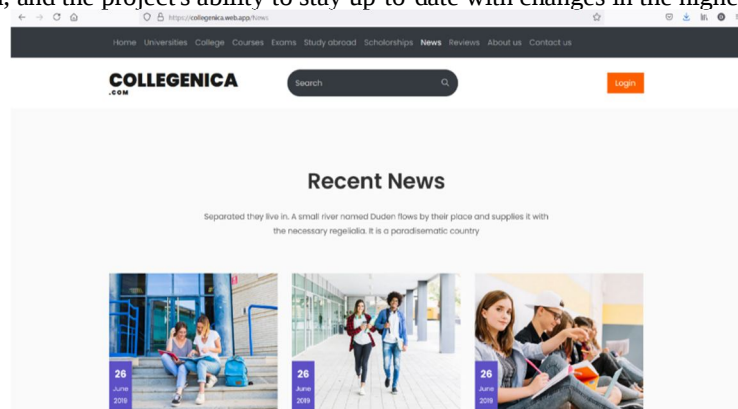


Figure 5 . Shows latest news of colleges

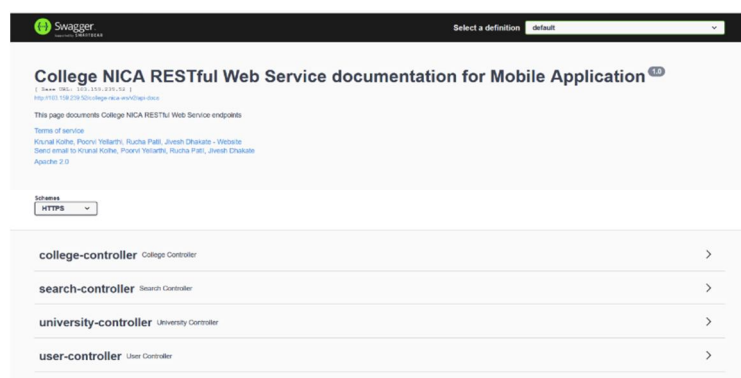


Figure 6 . Shows swagger connection with API

V. CONCLUSION

The web based app can be used by any individual who wants to search for colleges. The user will be able to create his/her login credential in this app. The input of college, course and seat matrix along with availability in real time will be provided by admin and the colleges. The app provides appropriate and verified information regarding

various courses as well as developmental activities taking place in colleges. The user will be able to view various college related description like college information, college ranking, placement records, infrastructure offered by the colleges, fees related queries. The user will be able to post Q&A and the authority to answer the Q&A will be provided to the verified colleges. During the course of this research, it was discovered that by using SQL databases and java framework spring(JDBC), API METHODS we could make the website responsive and real time college and course reviews could be used for the choice of best colleges and courses to the user.

REFERENCES

- [1] S. S. Zarish, S. Habib and M. Islam, "Analyzing Usability of Educational Websites Using Automated Tools," 2019 International Conference on Computer and Information Sciences (ICCIS), 2019, pp. 1-4, doi: 10.1109/ICCISci.2019.8716462.
- [2] Sun Jian-hong, Li Jun-sheng and Shang Yanling, "Comparative research of developing technologies of website," 2009 International Conference on Future BioMedical Information Engineering (FBIE), 2009, pp. 17-20, doi: 10.1109/FBIE.2009.5405866.
- [3] Z. C. Lee, J. Yurchisin and C. T. Lin, "The Impact of Website Attractiveness, Consumer-Website Identification, and Website Trustworthiness on Purchase Intention," 2010 IEEE/ACIS 9th International Conference on Computer and Information Science, 2010, pp. 301-306, doi: 10.1109/ICIS.2010.148.
- [4] U. Ibarra Hernández, F. J. Álvarez Rodríguez and M. Vargas Martin, "Use processes — modeling requirements based on elements of BPMN and UML Use Case Diagrams," 2010 2nd International Conference on Software Technology and Engineering, San Juan, PR, USA, 2010, pp. V2-36-V2-40, doi: 10.1109/ICSTE.2010.5608758.
- [5] A. Javeed, "Performance Optimization Techniques for ReactJS," 2019 IEEE International Conference on Electrical, Computer and Communication Technologies (ICECCT), 2019, pp. 1-5, doi: 10.1109/ICECCT.2019.8869134.
- [6] D. Laksono, "Testing Spatial Data Deliverance in SQL and NoSQL Database Using NodeJS Fullstack Web App," 2018 4th International Conference on Science and Technology (ICST), 2018, pp. 1-5, doi: 10.1109/ICSTC.2018.8528705.
- [7] F. Teng and Q. Wu, "Design and Implementation of the Information System of Retired Veteran Cadres Bureau Based on SpringBoot Framework," 2021 IEEE International Conference on Consumer Electronics and Computer Engineering (ICCECE), Guangzhou, China, 2021, pp. 87-92, doi: 10.1109/ICCECE51280.2021.9342126.
- [8] D. Yang, S. Zhu, S. Zhou, J. Wang and A. Cai, "The Design and Implement of Web MIS of Students Based on Servlet+JDBC," 2009 First International Workshop on Education Technology and Computer Science, Wuhan, China, 2009, pp. 1022-1025, doi: 10.1109/ETCS.2009.233.
- [9] A. Maraj, E. Rogova, G. Jakupi and X. Grajevci, "Testing techniques and analysis of SQL injection attacks," 2017 2nd International Conference on Knowledge Engineering and Applications (ICKEA), London, UK, 2017, pp. 55-59, doi: 10.1109/ICKEA.2017.8169902.
- [10] M. Zhang et al., "Intelligent business cloud service platform based on SpringBoot framework," 2020 Asia-Pacific Conference on Image Processing, Electronics and Computers (IPEC), Dalian, China, 2020, pp. 201-207, doi: 10.1109/IPEC49694.2020.9115131.
- [11] D. Li, L. Han and Y. Ding, "SQL Query Optimization Methods of Relational Database System," 2010 Second International Conference on Computer Engineering and Applications, Bali, Indonesia, 2010, pp. 557-560, doi: 10.1109/ICCEA.2010.113.
- [12] H. M. Abdullah and A. M. Zeki, "Frontend and Backend Web Technologies in Social Networking Sites: Facebook as an Example," 2014 3rd International Conference on Advanced Computer Science Applications and Technologies, Amman, Jordan, 2014, pp. 85-89, doi: 10.1109/ACSAT.2014.22.
- [13] HaiLan Pan, AnBao Wang and WenRong Jiang, "Discussion of course of E-commerce website construction based on java EE lightweight framework," 2010 2nd International Conference on Education Technology and Computer, Shanghai, China, 2010, pp. V1-442-V1-445, doi: 10.1109/ICETC.2010.5529211.
- [14] P. Dwivedi, Kshamta and A. Joshi, "ReactJS For Trading Applications," 2022 International Conference on Cyber Resilience (ICCR), Dubai, United Arab Emirates, 2022, pp. 01-07, doi: 10.1109/ICCR56254.2022.9995932.