iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 12 **Issue:** II **Month of publication:** February 2024

DOI: https://doi.org/10.22214/ijraset.2024.58264

www.ijraset.com

Call: 08813907089 | E-mail ID: ijraset@gmail.com

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 12 Issue II Feb 2024- Available at www.ijraset.com

Journeying through Query Verse: A MERN-Stack Implementation for Dynamic Web-based Inquiry

Mahadev Manerikar[1], Kishor Maski[2], Yash Sasane[3], Omkar Pawar[4]
[1, 2, 3, 4]*Student, Department of Computer Engineering, Zeal College of Engineering and Research, Pune, Maharashtra*

Abstract: ***The recognition of the need for a senior-junior question-answer web application emerged from interactions within educational institutions. Numerous instances of juniors seeking guidance from seniors led to the realization of a gap in information dissemination. The necessity to bridge the gap between students' queries and available answers became evident, Research into existing platforms revealed a limited number of solutions, predominantly Q&A websites and educational forums. Existing online platforms offer general Q&A interactions but fail to cater to the unique mentorship dynamics between seniors and juniors. These platforms lack features tailored to fostering these specific relationships. The implementation of a senior-junior question-answer web application is essential to formalize the mentorship process. Literature reviews unveiled gaps in platforms catering to such relationships, highlighting the need for a specialized solution. The proposed solution seeks to address these gaps.***

Keywords: Mentorship web app, MERN, Senior, Junior, Education gap, Q&A platforms.

I. INTRODUCTION

In the modern educational landscape, the transfer of knowledge and experiences between senior and junior students is a crucial aspect of personal and academic growth. Recognizing this, our team is committed to developing a web application that serves as a dedicated platform tailored to educational institutions. While other generic Q&A platforms like Quora exist, they often fall short when it comes to addressing the unique mentorship context within colleges and universities. Juniors often face challenges in connecting with their senior counterparts, and vice versa, resulting in missed opportunities for valuable guidance and support. As our research has revealed, the current platforms lack the necessary features to address the hierarchical nature of mentorship. Furthermore, these platforms typically offer generic responses, failing to provide personalized guidance. To bridge this gap, our solution aims to integrate algorithms that consider both the hierarchical structure of mentorship and provide tailored responses to juniors' specific needs. The envisioned platform will go beyond the traditional Q&A format and offer tiered access, ensuring that students can interact with their peers while receiving personalized recommendations and advice that caters to their academic journey. Our team's contribution to this endeavour involves the modification of existing algorithms to meet the specific demands of senior-junior mentorship dynamics. By implementing new features and tools, we aim to create an environment that fosters more productive mentorship experiences within the educational community. Our innovative approach includes a centralized API that organizations can seamlessly integrate into their portals. This API streamlines the process of facilitating frequently asked questions (FAQs) and general inquiries, empowering educational institutions to connect their students more effectively and offer a reliable means of communication between juniors and seniors. This holistic approach not only enhances learning experiences but also strengthens the sense of community and support within educational institutions.In summary, our web application endeavours to address the critical need for improved senior-junior interactions, knowledge sharing, and mentorship within educational institutions. By catering specifically to the unique challenges of college life, we aim to create a dynamic platform that connects students, enriches their learning experiences, and enhances the sense of unity within educational communities.

II. LITERATURE REVIEW

In the paper [1], Malin Jansson, Stefan Hrasinski. have developed a web application to explore how online question and answer sessions enhance students' inquiry processes in a text-based learning environment. Online Q&A sessions foster collaborative learning, encourage critical thinking, and provide students with a platform to support each other's learning. Potential drawbacks include limited real-time interaction, difficulty in assessing the quality of responses, and the risk of misinformation. Online question and answer sessions can be a valuable tool for promoting student engagement and peer support in text-based learning environments, but careful design and moderation are essential to maximize their benefits and mitigate potential disadvantages

©IJRASET: All Rights are Reserved

In the paper [2], Ankit Verma, Chavi Kapoor, has developed a web application that integrates machine learning to enhance user experience; the advantage lies in improved personalization and efficiency, yet potential drawbacks include data privacy concerns; in conclusion, this survey paper highlights the potential of ML-driven web apps while acknowledging the need for robust privacy safeguards.

In the paper [3], Doina Bein, Tharaga has developed a web application for social networking using Real-Time Communication (RTC) technology, aiming to enhance user interaction and connectivity. The advantage of this innovative system lies in its ability to enable seamless real-time communication, fostering more engaging social interactions. However, potential disadvantages include privacy concerns and increased data usage. In conclusion, this survey paper highlights the potential of RTC-based web applications to transform the landscape of social networking, offering a glimpse into the promising future of online connectivity.

In the paper [4], Feijóo García has developed a web application, "RoBlock – Web App for Programming Learning," aimed at providing an interactive and user-friendly platform for teaching and learning programming. The advantage of this application is its accessibility and flexibility, allowing users to learn at their own pace from any location with an internet connection. However, a potential disadvantage is the need for a stable internet connection, which may limit accessibility in some regions. In conclusion, "RoBlock" demonstrates great potential in enhancing programming education, but its effectiveness may depend on internet availability in certain areas.

In the paper [5], Min Jou Harish, et.al had developed a web application for 'A Web Application Supported Learning Environment' aimed at enhancing educational experiences through interactive online tools, with advantages including increased accessibility and flexibility, but potential drawbacks of reliance on technology and limited face-to-face interaction. In conclusion, this survey paper highlights the potential of web applications in education while acknowledging the need for a balanced approach to ensure effective learning outcomes.

In the paper [6], Kavita Jadhav, Aparna Pande et al had developed a web application "Student Interaction System Using Modern Web Technologies" aimed at enhancing student engagement and collaboration through online platforms. The advantage of this system lies in its ability to provide a convenient and interactive learning environment, fostering real-time communication and information sharing among students. However, the disadvantage may include potential challenges related to data security and privacy. In conclusion, the web application holds promise for improving student interaction and learning experiences, but careful attention to security concerns is essential for its successful implementation.

In the paper [7], Paula Miranda Vennan Sibanda and et.al had developed a web application to explore the evolution of E-Learning and Web Generations, aiming to advance towards the integration of Web 3.0 and E-Learning 3.0. The advantage of this survey paper lies in its comprehensive analysis of the technological advancements and educational paradigms, shedding light on the potential for more interactive and personalized online learning experiences. However, the disadvantage includes the evolving nature of web technologies, which may render certain findings subject to obsolescence. In conclusion, this paper serves as a valuable resource in understanding the dynamic relationship between E-Learning and Web Generations, offering insights into the future of digital education and its potential for transformative change.

In the paper [8], V. P. Semenov and et al. had developed a web application tailored to the needs of engineering students, providing personalized and adaptive educational content. The advantage of this application lies in its ability to offer customized learning experiences, catering to individual learning styles and pacing. However, a potential drawback may be the need for continuous updates to ensure relevance to evolving engineering curricula. In conclusion, this survey paper highlights the promising potential of adaptive educational web applications for engineering students while acknowledging the importance of ongoing maintenance and adaptation to stay current with the dynamic field of engineering education.

In the paper [9], Kazunori Toshioka and et al. had developed a web application to generate route bus timetables, offering the advantage of enhancing public transportation efficiency and convenience for commuters. However, potential disadvantages include the need for accurate data input and possible technical issues. In conclusion, this survey paper highlights the potential benefits of leveraging web applications for bus timetable generation, with a focus on addressing the associated challenges to ensure its successful implementation. In the paper [10], Rdouan Faizi, Raddouane Chiheb and et al had developed a web application to collect and analyze students' perceptions towards using Web 2.0 technologies in education. The advantage of this tool is its ability to efficiently gather a large amount of data from diverse sources, providing valuable insights into students' preferences and experiences with technology in education. However, a potential disadvantage is the need for robust data security measures to protect participants' privacy. In conclusion, the web application offers an innovative and convenient means to enhance our understanding of how students view the integration of Web 2.0 technologies in educational settings, but it must be accompanied by stringent privacy safeguards.

ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 12 Issue II Feb 2024- Available at www.ijraset.com

III.SOFTWARE REQUIREMENT SPECIFICATION

A. *Project Scope*

1) *Target Audience:* The primary scope of the project is to serve the student community within our college. The application will be exclusively available to our college students, providing them with a dedicated platform to seek solutions to their academic and extracurricular queries.
2) *Questions and Answer Forum:* The application will facilitate a robust question and answer forum where students can post doubts, seek answers, and engage in discussions. The scope includes features for asking, answering, and upvoting/downvoting questions and answers.
3) *E-Notes repository:* In addition to the Q&A forum, "Query-verse" will host a repository of E-notes, offering students access to a collection of educational materials relevant to their courses. The scope includes the ability for users to upload and download E-notes.
4) *Open Source Contribution:* To encourage collaborative learning and engagement, the project scope encompasses an open-source contribution feature.
5) *Access Control and Ranking:* The application will implement specific access controls, ensuring that only authorized users can view, ask, and answer questions

B. *User Classes and Characteristic*

1) *End Users:* a. Characteristics: i. Students and faculty members within the college. ii. Access to the application for seeking and providing academic and extracurricular help. iii. Varying technical proficiency levels. b. Requirements: i. User-friendly interface: The application should have an intuitive design to accommodate users with different technical backgrounds. ii. Role-based access: Students and faculty should have distinct roles, allowing faculty members to moderate content and manage specific categories. iii. Seamless communication: The ability to interact, ask questions, provide answers, and share resources easily within the platform.
2) *Maintenance Personnel:* a. Characteristics: i. Technical staff responsible for maintaining and updating the application. ii. Proficient in software development, server management, and database administration.b. Requirements: i. Version control and deployment tools: Access to version control systems (e.g., Git) and deployment tools to manage updates and maintenance. ii. Monitoring and analytics: Tools for real-time monitoring of the application's performance, including server health, error tracking, and user activity analytics. iii. Backup and recovery: Robust backup and recovery mechanisms to safeguard against data loss or system failures.
3) *Administrators/Managers:* a. Characteristics: i. Responsible for overseeing multiple vending machines in different locations. ii. In charge of monitoring stock levels, revenue, and maintenance schedules. b. Requirements: i. Real-time data tracking and reporting tools for efficient management. ii. Remote access to machine status and inventory levels. iii. Customizable settings for pricing and inventory management.
4) *Developers/Technicians:* a. Characteristics: i. Technical professionals responsible for the development, maintenance, and enhancement of the "Query-verse" web application. ii. Proficient in various programming languages, development frameworks, and database management systems.
5) *Stakeholders/Investors:* a. Characteristics: i. Individuals or organizations funding the project and expecting a return on investment. ii. Concerned about the project's success and market penetration. b. Requirements: i. Regular progress reports and updates on the project's development. ii. Clear communication regarding potential challenges and risk mitigation strategies. iii. Assurance of the project's sustainability and market competitiveness.

C. *Assumptions and Dependency*

Assumptions

1) *Stable Network Infrastructure:* It is assumed that the college has a stable and reliable network infrastructure to support the web application's data transfer and communication needs.
2) *Access to College Resources:* Users are assumed to have access to relevant college resources, including course materials, extracurricular information, and announcements.
3) *User Engagement:* It is assumed that students and faculty will actively engage with the platform and contribute to its growth by asking questions, providing answers, and sharing E-notes.

©IJRASET: All Rights are Reserved | SJ Impact Factor 7.538 | ISRA Journal Impact Factor 7.894 |

4) *Data Privacy and Security:* Assumption is made that robust data privacy and security measures are in place to protect user data and prevent unauthorized access.
5) *Sufficient Hardware Resources:* The server infrastructure required to host the application is assumed to have adequate hardware resources for efficient operation and scalability.
6) *Technical Support:* Users can seek technical support or guidance from the college's IT department in case of issues related to using the application.
7) *User Authentication:* Users are assumed to have unique college-issued authentication credentials for accessing the platform securely.
8) *Compatibility:* Assumption is made that the application will be compatible with commonly used web browsers and devices.
9) *Content Moderation:* It is assumed that content moderation and compliance with college policies will be effectively managed by administrators.
10) *User Adoption:* Assumption is that there will be a gradual increase in user adoption as the platform gains popularity within the college community.

D. Dependencies

1) *Stable Network Infrastructure:* It is assumed that the college has a stable and reliable network infrastructure to support the web application's data transfer and communication needs.
2) *Access to College Resources:* Users are assumed to have access to relevant college resources, including course materials, extracurricular information, and announcements.
3) *User Engagement:* It is assumed that students and faculty will actively engage with the platform and contribute to its growth by asking questions, providing answers, and sharing E-notes.
4) *Data Privacy and Security:* Assumption is made that robust data privacy and security measures are in place to protect user data and prevent unauthorized access.
5) *Sufficient Hardware Resources:* The server infrastructure required to host the application is assumed to have adequate hardware resources for efficient operation and scalability.

E. Functional Requirements

Questions and Answer Forum :

Users should be able to post questions, providing details and tags to categorize their queries. ii. Answers should be displayed chronologically, and users can upvote and downvote answers to indicate their usefulness.

E-Notes repository: i. The application must provide a dedicated section for uploading, searching, and downloading E-notes, ensuring easy access to educational resources. ii. Users should be able to contribute by uploading and categorizing E-notes based on their subject matter.

User-Role Permission: i. The system should support multiple user roles, including students, faculty, administrators, and developers, each with different permissions and access levels. ii. User roles must be defined to facilitate content moderation, user management, and overall platform control.

Content Moderation and Reporting: i. The application should offer moderation tools for administrators to review and manage user-generated content for quality, accuracy, and compliance with college policies. ii. Users should be able to report inappropriate or irrelevant content for review.

Search and recommendation: i. The system should incorporate a robust search feature to help users find relevant questions, answers, and E-notes. ii. A recommendation system should suggest similar questions or relevant Enotes to enhance user engagement and learning.

F. External Interface Requirement

Web-Based User Interface: i. The application's user interface must be web-based, accessible through standard web browsers, and responsive to various device screen sizes.

User registration and login: i. The registration and login pages must have a user-friendly design with clear instructions and validation checks to guide users through the process.

Dashboard: i. Upon login, users should be presented with a personalized dashboard displaying their questions, answers, favorite categories, and recent activity.

ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 12 Issue II Feb 2024- Available at www.ijraset.com

Questions and Answers Interface: i. The Q&A interface should allow users to post questions and answers, featuring a rich text editor, tagging system, and voting mechanisms for user interaction.
Maintenance Interface: i. The system should have a maintenance interface for technicians to access diagnostic information and perform necessary repairs or updates. ii. It should provide detailed error logs and troubleshooting instructions for efficient maintenance.
External Data Integration: i. The system should be capable of integrating with external databases or inventory management systems for streamlined stock replenishment and tracking. ii. It should support data exchange protocols to synchronize inventory data with external systems.
Reporting and Analytics Interface: i. The system should provide interfaces for generating comprehensive reports and analytics accessible to administrators through a web-based dashboard or the mobile application. ii. It should allow for customizable report generation and data visualization for informed decision-making

G. Nonfunctional Requirements

Performance Requirements

1) *Response Time:* The system must respond to user interactions within a maximum of 2 seconds. This response time includes actions like loading pages, submitting queries, and rendering dynamic content. Ensuring low latency is critical for a positive user experience.
2) *Scalability:* The application should scale horizontally by adding more servers and resources as user traffic increases. This should be done dynamically to ensure that the application can handle high loads during peak times. The system must also employ load balancing techniques to distribute traffic evenly across servers.
3) *Throughput:* The system should be capable of supporting a minimum of 1,000 concurrent users without a significant decrease in performance. This ensures that the platform can handle Simultaneous interactions.Safety requirements

H. Security Requirements

1) Data Encryption

a) Data encryption is essential to protect user privacy and the confidentiality of sensitive information. All data transmitted between the client and the server (in transit) must be encrypted using industry-standard encryption protocols such as TLS/SSL.
b) Additionally, data stored on the server (data at rest) should be encrypted. iii.Proper encryption practices should include secure key management and regular rekeying to mitigate potential security risks.

2) Authentication and Authorization

a) *Strong Authentication:* Mechanisms, including multi-factor authentication (MFA), should be implemented to verify the identities of users. MFA adds an extra layer of security by requiring users to provide multiple forms of verification, such as a password and a one-time code sent to their mobile device. Role-based access control (RBAC) is vital to ensure that users are granted or restricted access to specific features based on their roles. For example, administrators should have access to moderation tools, while regular users may not.
b) *Data Protection:* The application should be designed to prevent common web security vulnerabilities, such as SQL injection, cross-site scripting (XSS), and cross-site request forgery (CSRF). This can be achieved through code reviews, security testing, and input validation. Regular security audits and penetration testing should be conducted to identify and address vulnerabilities. A responsible disclosure policy should be in place to encourage users to report security issues without fear of legal repercussions.

I. System Requirements

Database Requirements

1) *User Profiles and Roles:* Database should store user profiles and their associated roles (senior, junior, administrator, developer) to enable role-based access control and tailored user experiences. User data should include personal information, profile pictures, and user-generated content.
2) *Interaction Records:* Maintain a record of interactions between senior and junior users, including questions, answers, comments, and upvotes. These records should be efficiently organized to support real-time notifications, user activity feeds, and content recommendations.

©IJRASET: All Rights are Reserved | SJ Impact Factor 7.538 | ISRA Journal Impact Factor 7.894 |

3) *Content Categorization:* Implement a robust database structure for categorizing content, including questions, answers, and E-notes. Categorization should enable efficient search and filtering, enhancing user experience by helping users discover relevant content easily.
4) *Data Privacy and Security:* Ensure user data privacy and security by implementing data encryption, access controls, and secure user authentication mechanisms within the database. Protect user data from unauthorized access, adhering to privacy regulations and college policies.

J. Software Requirements

Here are software requirements for the "Query-verse" web application in the MERN stack that facilitate senior-junior interaction:

1) *User Role-Based Access:* The application must support distinct user roles, including "senior" and "junior." Senior users may include faculty or experienced students, while junior users are typically undergraduate or newer students. Each role should have specific permissions and access levels. For instance, seniors might have the ability to mentor and moderate content, while juniors can ask questions and seek guidance. This feature ensures a targeted and relevant interaction between senior and junior users.
2) *Mentoring and Guidance Tools:* The application should include features that enable seniors to offer guidance and mentorship to junior users. This might involve a mentorship program where seniors can volunteer to assist juniors with their academic and extracurricular queries. Features like direct messaging, scheduled mentorship sessions, or designated mentorship categories can facilitate this interaction.
3) *Content Tagging and Categorization:* Effective content tagging and categorization are essential for enabling seniors to provide targeted assistance to juniors. The system should allow users to categorize content, such as questions, answers, or E-notes, with tags or labels. This categorization ensures that junior users can easily find content relevant to their needs and seek advice or guidance from seniors with expertise in specific areas.

K. Hardware Requirements

Here are hardware requirements for the "Query-verse" web application based on the MERN stack, with a focus on enabling senior and junior interaction:

1) *Server Infrastructure:* The application should be hosted on a robust and scalable server infrastructure. This infrastructure should include powerful processors, ample RAM, and high-speed storage to ensure the system can handle concurrent user interactions efficiently. To foster senior and junior interaction, the servers should support high availability and reliability to minimize downtime.
2) *Database Server:* An appropriately configured database server is essential to manage user data, questions, answers, E-notes, and other content. The server must have sufficient storage capacity and high read/write speeds to handle data-intensive operations effectively. This infrastructure should be designed to scale with increased data and user loads to support continued growth and interaction among senior and junior users.
3) *Load Balancing and Redundancy:* To ensure consistent availability and even distribution of traffic, a load balancing solution should be implemented. Load balancers distribute incoming requests across multiple servers, preventing any single server from becoming a bottleneck and enhancing user interaction for both senior and junior users. Redundancy measures should also be in place, ensuring that the application remains accessible in case of hardware failures or maintenance.
4) *Content Delivery Network (CDN):* Implementing a CDN can enhance the performance of the application, especially when interacting with media-rich content, such as E-notes. CDNs cache and deliver content from servers located closer to users, reducing latency and load times. This improves the overall user experience for both seniors and juniors, making content more accessible and interactive.

IV. SYSTEM IMPLEMENTATION PLAN

System Implementation Plan for Query-verse Web Application

1) *Team Formation and Roles:* Assemble a development team, including front-end and back-end developers, UI/UX designers, database administrators, and quality assurance testers. Assign roles and responsibilities, defining who will lead each development component.
2) *Development Environment Setup:* Establish a development environment for the MERN stack, including setting up Node.js, MongoDB, and any necessary development tools and libraries. Implement version control using Git, create a repository, and set up branching strategies.

3) *Database Design and Development:* Develop the database schema, defining tables, relationships, and data models. Create scripts for database initialization and seed data for testing purposes.
4) *Front-End Development:* Begin developing the front-end of the application using the MERN stack: Design the user interface, including layouts, navigation, and components. Implement user registration, login, and profile management. Develop the question-andanswer forum, E-notes repository, and user interactions. Continuously test and debug the front-end components.
5) *Back-End Development:* Develop the server-side components of the application. Implement APIs for user management, content creation, and interaction features. Create a notification system for updates and interactions between users. Ensure security features, including authentication, authorization, and data encryption, are properly integrated.
6) *Integration and Testing:* Integrate the front-end and back-end components, ensuring seamless data flow and communication between the two layers. Conduct unit testing and integration testing for individual features and overall functionality. Implement automated testing scripts for regression testing
7) *User Testing:* Organize user testing sessions, inviting senior and junior students to use the application and provide feedback. Iteratively refine the application based on user feedback.
8) *Security Evaluation:* Conduct security testing to identify and address potential vulnerabilities, including penetration testing and code reviews. Implement security best practices to protect user data and privacy.
9) *Documentation and Knowledge Transfer:* Document the application's architecture, codebase, and APIs for reference and future development. Ensure knowledge transfer within the development team to support ongoing maintenance and feature enhancements.
10) *Deployment:* Deploy the application to a production environment, such as a cloud server or a college-managed server. Configure the server for security, performance, and scalability.
11) *User Training and Rollout:* Provide user training sessions to introduce the application to senior and junior students. Roll out the application to the college community, ensuring a smooth transition and addressing any initial user queries.
12) *Monitoring and Support:* Implement monitoring tools to track the application's performance and user activity. Provide ongoing support and maintenance to address issues, apply updates, and ensure the system's continuous operation.
13) *Feedback and Iteration:* Encourage user feedback and continuously gather suggestions and bug reports. Use user input to guide future iterations and improvements.

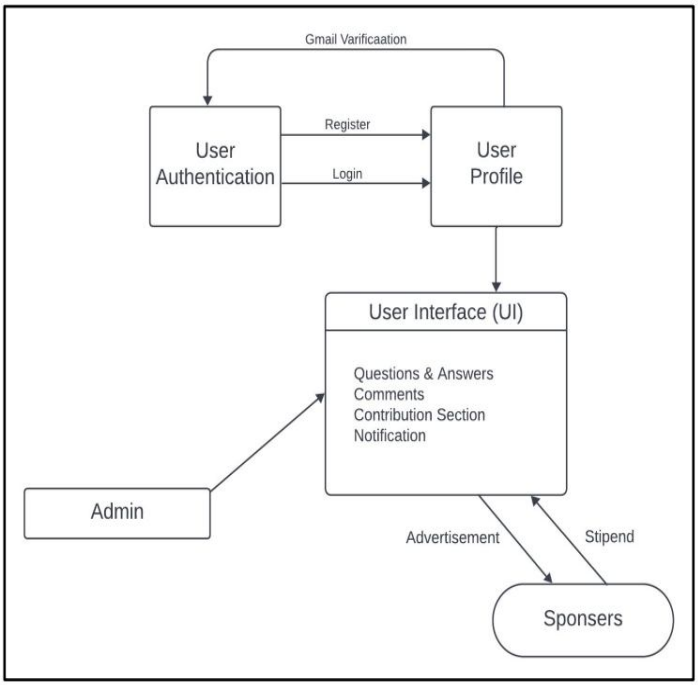


Fig 1: System Architecture

1.User Authentication: Authentication checking phase 2.User Profile: Profile of user 3.User Interface: Main interface of Application 4.Admin: Administrator of web application.

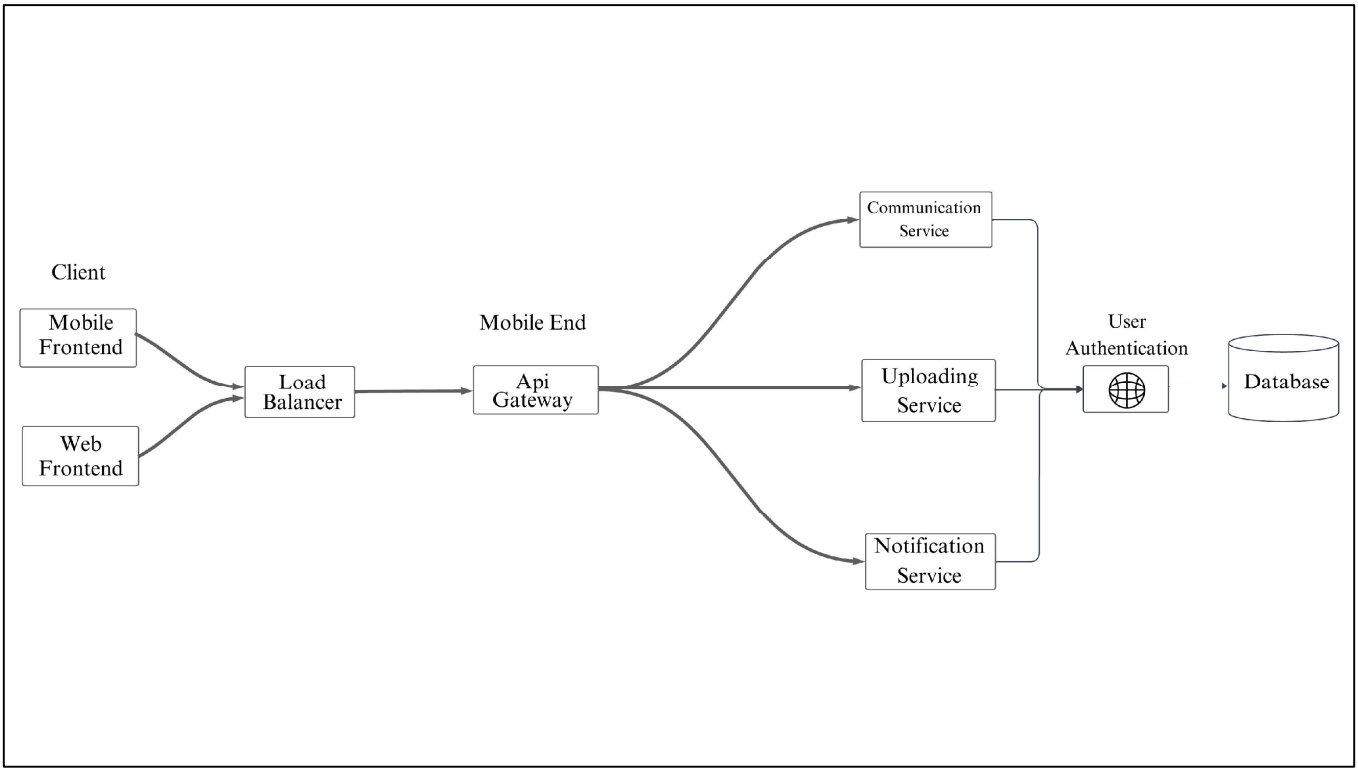


Fig 2 : Data Flow diagram

V. OTHER SPECIFICATIONS

A. *Advantages*

1) *Enhanced Mentorship:* The application fosters a mentorship environment by facilitating easy interaction between senior and junior students, leading to valuable knowledge transfer and guidance.
2) *Tailored Access Levels:* The platform offers specific access control, ensuring that information and interactions are relevant and secure for both seniors and juniors.
3) *User Registration:* User-friendly registration processes make it easy for students to join and engage with the application, streamlining the onboarding experience.
4) *Efficient Knowledge Sharing:* Users can share e-notes, creating a digital repository of knowledge resources that benefit both seniors and juniors.
5) *Community Building:* The application strengthens the sense of community within educational institutions by encouraging collaboration and communication among students.
6) *Personalized Guidance:* With the provision of personalized recommendations, seniors can offer specific guidance to juniors based on their individual needs and aspirations.
7) *Open Source Contribution:* The application's open-source nature promotes collaborative development, allowing for continuous improvement and customization to suit diverse educational environments.
8) *Holistic Learning:* The platform supports holistic learning, bridging the gap between classroom education and real-world experiences through peer-to-peer interactions.
9) *Enhanced Academic Choices:* Juniors can make informed academic decisions with the help of senior insights, contributing to better course selection and career planning.
10) *Time-Efficient FAQ Handling:* The application's FAQ feature streamlines common inquiries, reducing the time spent on repetitive questions and providing quick solutions for students.

B. Applications

1) *Educational Institutions:* Implement Query-Verse in universities and colleges to facilitate senior-junior interactions, enabling students to seek guidance on academic choices and career decisions.
2) *Mentorship Programs:* Use Query-Verse as a dedicated platform for mentorship programs, connecting mentors and mentees within organizations, enhancing knowledge sharing and professional growth.
3) *Student Communities:* Create specialized communities within the application for student organizations or clubs, where members can collaborate, share resources, and plan events.
4) *Online Study Groups:* Form study groups within Query-Verse to help students collaborate on coursework, share study materials, and ask questions specific to their courses.
5) *Open-Source Contribution:* Encourage open-source projects by using QueryVerse as a platform for developers to share their knowledge, seek help, and contribute to open-source software development.

VI. CONCLUSION

In conclusion, “Query-Verse web application using MERN Stack," has successfully addressed the crucial need for an efficient senior-Junior Question-Answer Web Application dedicated to mentorship and enhancing interaction between senior and junior students. We have developed a platform that offers features such as user registration, e-note sharing, open-source contributions, and specific access controls, catering to the unique dynamics of mentorship within educational institutions.Our application, Query Verse, provides a valuable solution to bridge the knowledge gap between seniors and juniors, facilitating meaningful interactions and fostering a supportive learning environment. Looking ahead to future work, there are several exciting avenues for expansion and improvement. First and foremost, we aim to gather feedback from users to further refine and enhance the user experience. This feedback will be crucial in identifying areas for improvement and ensuring that Query-Verse continues to meet the evolving needs of the educational community. Additionally, we plan to explore the integration of artificial intelligence and machine learning algorithms to provide more personalized mentorship recommendations and to enhance the content sharing features. We also envision the expansion of our open-source contribution aspect, allowing students to collaborate on academic and creative projects. Furthermore, as our user base grows, we will focus on maintaining data security and privacy to protect the information shared within the platform. Ultimately, our goal is to establish Query-Verse as a cornerstone in the educational ecosystem, promoting collaborative learning and mentorship among students

VII. ACKNOWLEDGEMENT

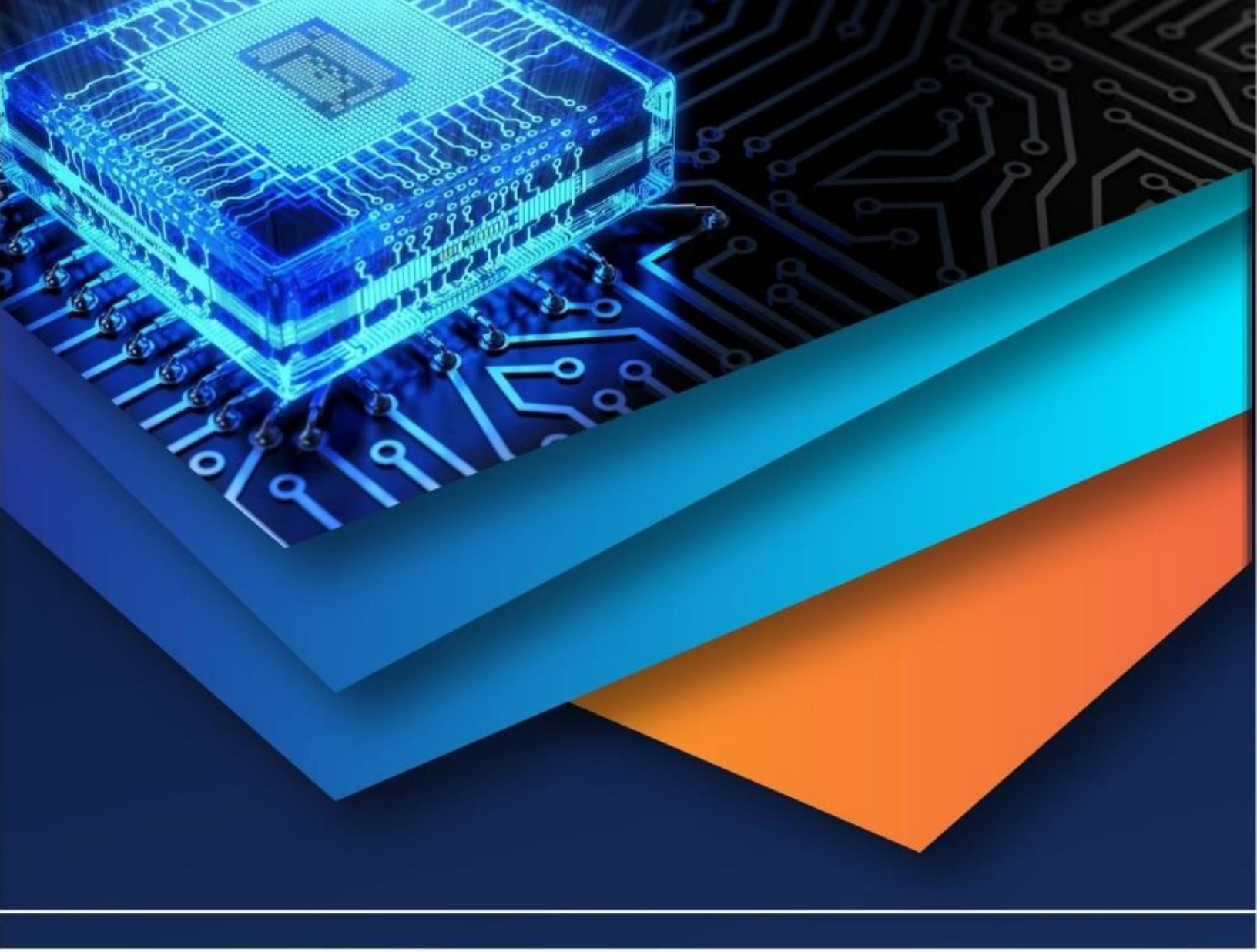
The successful completion of the project, "Query-Verse web application using MERN Stack," marks a significant milestone in addressing the critical need for an efficient Senior-Junior Question-Answer Web Application dedicated to mentorship and fostering interaction between senior and junior students. We express our gratitude to all those who contributed to the development of QueryVerse, enabling the creation of a platform with essential features such as user registration, enotes sharing, open-source contributions, and specific access controls. QueryVerse serves as a valuable solution, bridging the knowledge gap between seniors and juniors, facilitating meaningful interactions, and fostering a supportive learning environment. As we reflect on this accomplishment, we recognize the importance of ongoing improvement and expansion. Gathering feedback from users will be a priority to refine the user experience and identify areas for enhancement. Looking ahead, we are excited about exploring the integration of artificial intelligence and machine learning algorithms to offer personalized mentorship recommendations and enhance content sharing features. Additionally, plans include the expansion of the open-source contribution aspect, enabling collaborative projects among students. With a growing user base, our commitment extends to maintaining robust data security and privacy measures, ensuring the protection of shared information within the platform. Our ultimate goal is to establish Query-Verse as a cornerstone in the educational ecosystem, promoting collaborative learning and mentorship among students.

REFERENCES

[1] Malin Jansson, Stefan Hrastinski, Stefan Stenbom, Fredrik Enoksson (2021). Online question and answer sessions: How students support their own and other students’ processes of inquiry in a text-based learning environment.The Internet and Higher Education 51 (2021) 100817
[2] Ankit Verma, Chavi Kapoor (2021). Web Application Implementation with Machine Learning. 2021 2nd International Conference on Intelligent Engineering and Management (ICIEM) | 978-1-6654-1450-0/20/$31.00 ©2021 IEEE | DOI: 10.1109/ICIEM51511.2021.9445368.
[3] Nileshkumar Pandey, Doina Bein. (2018). Web Application for Social Networking using RTC 978-1-5386-4649-6/18/$31.00 ©2018 IEEE
[4] P.G.Feijóo García, F.De la Rosa.(2016). .RoBlock – Web App for Programming Learning.coniJET- Volume 11, Issue 12, 2016

[5] Yen-Ting Lina, Min Joua (2012). A Web Application Supported Learning Environment for Enhancing Classroom Teaching and Learning Experiences.Procedia - Social and Behavioral Sciences 64 (2012) 1 – 11
[6] Kavita Jadhav, Aparna Pande.(2022) Student Interaction System Using Modern Web Technologies © Scandinavian Journal of Information Systems, 2022 34(2), 3-38 © Scandinavian Journal of Information Systems, 2023 35
[7] Paula Miranda,Pedro Isaias,Carlos J.Costa(2014). E-Learning and Web Generations: Towards Web 3.0 and E-Learning 3 .02014 4th International Conference on Education, Research and Innovation IPEDR vol.81 (2014) © (2014) IACSIT ress, Singapore DOI: 10.7763/IPEDR.2014.V81.15
[8] MARYAM A. AL-OTHMAN, JOHN H. COLE,(2016).An Adaptive Educational Web Application for engineering Students Digital Object Identifier 10.1109/ACCESS.2016.2643164. 2169-3536 2017 VOLUME 5, 2017 IEEE.
[9] Kazunori Toshioka,Takao Kawamura and Kazunori Sugahara(2019). Web Application to Generate Route Bus Timetables.The Third International Conference on Internet and Web Applications and Services.
[10] Rdouan Faizi, Raddouane Chiheb.(2015)Students' Perceptions Towards Using Web 2.0 iJET – Volume 10, Issue 6, 2015

©IJRASET: All Rights are Reserved | SJ Impact Factor 7.538 | ISRA Journal Impact Factor 7.894 |



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Call : 08813907089 (24*7 Support on Whatsapp)