SE3040 – Application Frameworks

BSc (Hons) in Information Technology

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Faculty of Computing

SLIT

2023 – Group Project

SRS

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Application Topic	Inclusion and Empowerment - Disability Consultation Platform
Group Name	Freebirds

Project Declaration

We, the members of Freebirds, hereby declare that our group project is entirely authentic and original. We have conducted thorough research and analysis to ensure that our work is not plagiarized or copied from any other sources.

We have followed all guidelines provided by our LIC and have complied with all ethical and academic standards.

We take full responsibility for the authenticity of our work and understand the implications of academic dishonesty. We have worked collaboratively to produce this project, and each member has contributed to the best of their abilities.

We hereby affirm that our project represents our honest effort and commitment to academic integrity, and we take pride in presenting it as our own.

Group Leader (Signature)
Perera M.R.A.

Table of Content

Introduction

The purpose of this Software Requirements Specification (SRS) document is to provide a detailed overview of the requirements for a web-based platform that connects differently-abled people with consultants specializing in medical, social, legal, and other fields that can assist them. The platform aims to provide a centralized hub for individuals with disabilities to access expert advice, support, and information about their unique needs.

The platform will allow consultants to publish articles related to their specialty, providing valuable insights and information to users. The platform will also feature dedicated admins responsible for verifying consultant credentials during registration and managing user complaints.

The differently abled users will have the ability to directly communicate with the consultants. They can have one-to-one sessions with consultants as necessary. The platform will also provide users with information on how to contact and utilize resources outside of the platform that is provided by the consultants.

The SRS document will outline the various functional and non-functional requirements the platform must meet to ensure a seamless and user-friendly experience for consultants and users. It will also detail the various use cases, user interfaces, and system features required for the successful implementation of the platform.

Overall, the platform's ultimate goal is to improve the lives of differently-abled people by providing them with a comprehensive resource for support, guidance, and expert advice.

Contribution

Article Management - IT20609658 - Perera M.R.A.

The article management system is a critical component of our platform, connecting differently abled individuals with specialized consultants. This system allows consultants to create and publish articles relevant to their area of expertise, which can be searched and accessed by users. The system also enables consultants to attach images, videos, and other media to their articles, making them more engaging and informative. By facilitating the creation and dissemination of valuable content, the article management system will help ensure that our platform remains a valuable resource for all users.

Consultant Management - IT20633790 - Rupasinghe S.P

Consultant management is a critical aspect of our platform, designed to enable consultants to showcase their expertise and connect with users seeking specialized support. The consultant management system will allow consultants to create and manage their profiles, including their areas of expertise and availability. Consultants will also be able to use the system to make conversation via audio/video mediums with those who need their consultation and make them well guided.

By providing consultants with the tools they need to effectively manage their interactions with clients, the consultant management system will help ensure that our platform remains a valuable resource for differently-abled individuals seeking specialized support

Client Management - IT20625016 - Nanayakkara H.M.S.Y

Client management is an essential part of our platform, designed to facilitate the interaction between differently-abled individuals and specialized consultants. This system allows users to search for and connect with consultants based on their expertise and availability. The platform's intuitive interface will make it easy for users to find consultants and track their interactions with consultants. By providing a streamlined and user-friendly experience, the client management system will help ensure that our platform remains a valuable resource for differently-abled individuals seeking specialized support.

Admin Management – IT20631192 - Ekanayake E.M.S.D

Admin management is a vital component of our platform, designed to ensure the smooth operation of the system. The admin management system will enable our platform's administrators to manage user complaints, verify the registration of consultants, and monitor the platform's usage. It will also include features to allow administrators to manage user data and profiles, ensuring that the platform remains a safe environment for all users. By providing administrators with the tools they need to manage the platform effectively, the admin management system will help ensure that our platform remains a valuable resource for differently-abled individuals seeking specialized support.

Functional Requirements

Article Management - IT20609658 - Perera M.R.A.

- Consultant Access: only verified consultants and platform admins should be allowed to access the article management feature.
- Article Creation: Consultants should be able to create and publish articles related to their specialty, including text, images, and other media as required.
- Article Editing and Deletion: Consultants should be able to edit and delete articles as required, with changes immediately reflected on the platform.
- Article Search: Users should be able to search for articles based on keywords, topics, or consultant names, with search results displayed in a clear and organized manner.
- Article Viewing: Users should be able to view articles in a user-friendly format, with text, images, and other media displayed in an organized and easy-to-read manner.
- Article Rating: Users should be able to rate articles based on their usefulness and relevance, with ratings visible to other users to help them find high-quality content.

Consultant Management - IT20633790 - Rupasinghe S.P

- Consultants should be able to register themselves by providing required details such as name, address, email, contact number, profession, designation, and brief introduction without any interaction with the administrator.
- After the registration, they should be restricted to login by provided credentials until the registered profile got approved and verified by the administrator.
- Once an account is approved, the consultant should be able to customize and edit their profile page and add descriptive details and important text content that visible to patients and other stakeholders of the system.

- Consultants should be able to reply and continue conversations started by people who need consultations or any other guidance.
- The conversation medium could be text or video call.
- Text conversation should be persistent and chat history should be available among all clients who got contacted.
- Consultants should be able to publish articles related to their domain and those articles should be available within the platform. Same time they should be able to edit and remove those published articles as well.
- Consultants should be able to change their account details such as an address, contact number, email, designation, and password. Other account details should be restricted from change. (Name and Profession)
- Consultants should be able to delete their profiles themselves. Deleted account details must be moved into a separate data store and should be accessible for platform administrators if needed.

Client Management - IT20625016 - Nanayakkara H.M.S.Y

- The client can register to the system by providing some personal details such as name, email, phone number, password, and some details relevant to their conditions.
- The client can log in to the system using their email and enter a password during the registration.
- System should provide a user-friendly way to reset client passwords in case they forget them.
- Clients who are logged in can provide feedback explaining their good and bad experiences with this app or another user or consultant using this app. And they are able to provide some suggestions as well.
- Logged-in clients are able to browse and view articles published by various qualified consultants. And they can add some comments and likes as well.
- Logged-in clients can contact the consultants and communicate with them using the chat section. They can get some details about the disease and other details as well.
- Clients can view their profiles and update the details to their requirements. And they can delete the account if they need.

Admin Management – IT20631192 - Ekanayake E.M.S.D

- User Management: If the user wants to access the system as an admin, he must log into the system as an admin. Admin cannot register and must log into the system with an accounts provided by the system.
- Consultant Management: The system must provide features for managing consultant profiles, including approving new consultants, rejecting consultants, and removing consultants. An administrator must have the ability to manage consultant access permissions.
- Communication Management - The ability to send and receive messages to/from users. And Video calls can be made with the consultant when necessary.
- Article management - The ability to create, edit, and publish articles on the website. The administrator can view all articles in the feed of the website.

- Notification Management - A broadcast system can be managed to inform the users of the required details of the system.
- View Consultant details - The administrator can view pending, approved, rejected, and deleted consultants. While showing the deleted account details, the system should show the deleted account by admin separately and the system should show the deleted account by consultant separately.

Non-functional Requirements

Article Management - IT20609658 - Perera M.R.A.

- Performance: The article management feature should be designed to handle a large volume of articles and users without experiencing any significant performance issues or delays.
- Security: The article management feature should be designed with robust security features to protect user data and prevent unauthorized access to the platform and its contents.
- Reliability: The platform should be designed to be reliable, with minimal downtime or service interruptions to ensure that users can access the article management feature whenever they need it.
- Scalability: The platform should be designed to be scalable, with the ability to handle increasing numbers of users and articles as the platform grows over time.
- Usability: The article management feature should be designed to be user-friendly and intuitive, with clear navigation and user interfaces that make it easy for consultants to create and manage articles, and for users to find and access the content they need.

Consultant Management - IT20633790 - Rupasinghe S.P

- **Accessibility** of consultants' accounts must be fully restricted to all other users in order to secure privacy and unauthorized activities.
- When composing or editing their articles, existing content should be persistent even if they closed their tab mistakenly while composing/editing. It will make a **consistent user experience.**
- In terms of **compatibility**, the System should be responsive to most common devices such as tablets, mobile, and desktops.
- Chat/video call components must work in real-time and **with less delivery time** in order to insure a perfect **user experience** and conflicts between communicators.

Client Management - IT20625016 - Nanayakkara H.M.S.Y

- Security - The system should implement password encryption, token-based authentication, authorization, and private routes as well.
- Privacy - The system should always try to ensure the privacy of all users. So user data should be always protected and the data can access authorized parties only.
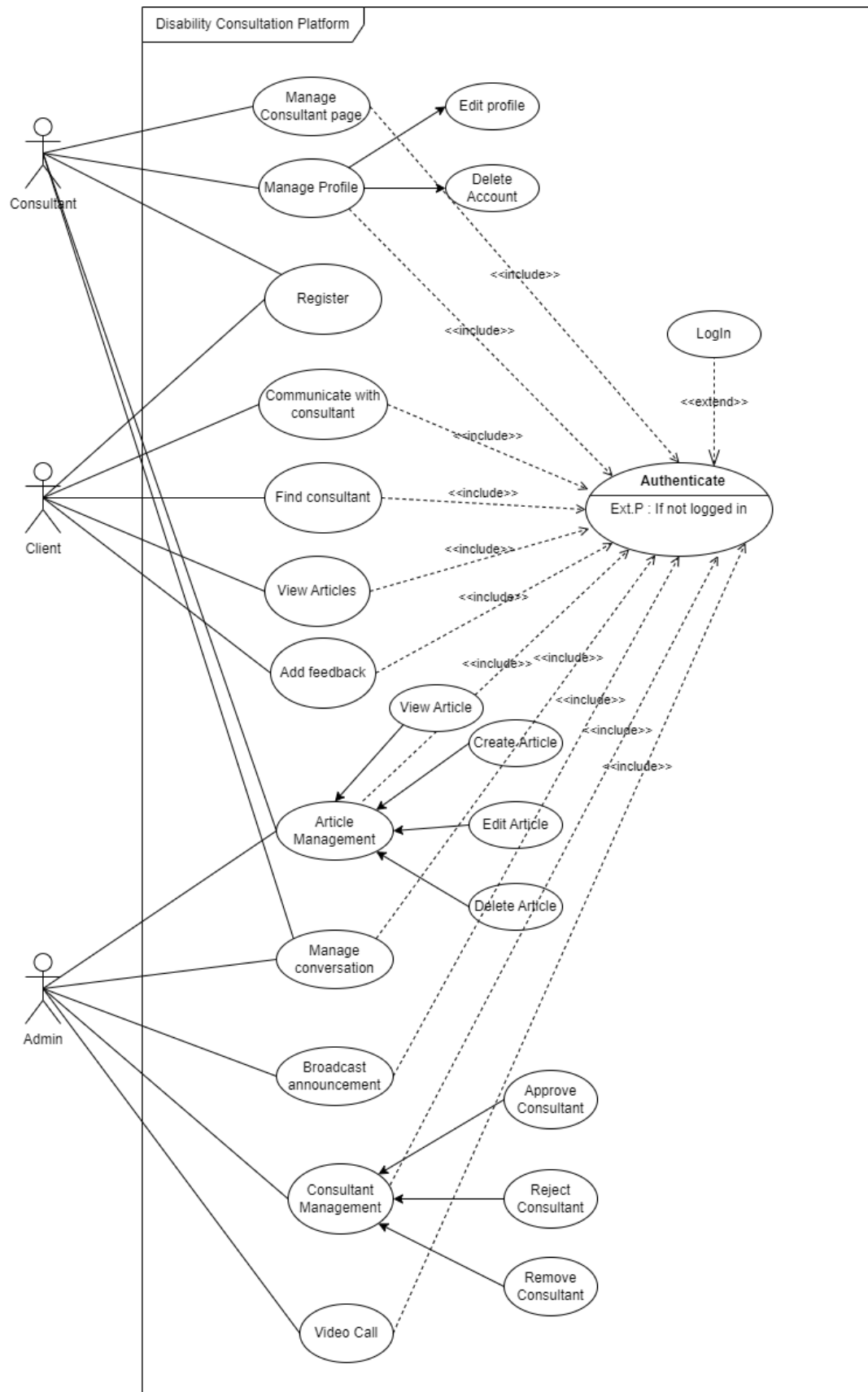
- User Experience - Easy registration, article browsing, searching, and filtering, and user-friendly and attractive UI should be implemented in the system.
- Accuracy - User-entered information should be validated using various validation methods and increase the accuracy of the data. When displaying details the data should be validated according to the user, Always try to suggest relevant details only.
- Performance - Client-consultants' communication should be real-time so the system has high performance to handle it. Should be used web sockets in the implementation.

Admin Management – IT20631192 - Ekanayake E.M.S.D

- Performance: The administrator management processes should be fast and responsive to ensure efficient management of the system.
- Reliability: The system must be reliable and available at all times, with minimal downtime or disruptions.
- Security: The system must be secure and protect user data from unauthorized access or breaches. This includes features like secure login, password management, encryption, and access control. Also, the admin stores all deleted accounts.
- Usability: The system must be easy to use and navigate, with clear instructions and help documentation available for users. Therefore admin can view details separately.
- Scalability: The system must be scalable to handle increases in users or data without compromising performance. Removes unnecessary data based on the time the data is stored.

User Interface Requirements

Use Case Diagram

Disability Consultation Platform

Consultant

Client

Admin

Manage Consultant page
Edit profile
Manage Profile
Delete Account
Register
Communicate with consultant
Find consultant
View Articles
Add feedback
View Article
Create Article
Edit Article
Article Management
Delete Article
Manage conversation
Broadcast announcement
Approve Consultant
Consultant Management
Reject Consultant
Remove Consultant
Video Call
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Article Management - IT20609658 - Perera M.R.A.

- User Dashboard: Consultants should have access to a dashboard that allows them to create, edit, and manage their articles, including the ability to search, and sort their articles as required.
- Article Creation Interface: The article creation interface should be user-friendly and intuitive, allowing consultants to easily create and publish articles, including the ability to add images, videos, and other media as required.
- Article Management Interface: The article management interface should allow consultants to easily view, edit, and delete their articles.
- User Article View Interface: The user article view interface should be user-friendly and intuitive, with clear navigation and easy-to-read text, images, and other media.

Consultant Management - IT20633790 - Rupasinghe S.P

- Within the Registration (SignUp) page, all validation errors should be displayed in real-time without waiting until form submission.
- Notification popups should be available around all user journeys in order to get acknowledgment about the background actions.
- Color themes/combinations and screen layout should be the same across the entire user journey.
- All input fields should have available placeholders and responsive alignments across the user scope.
- Buttons and interactable components must be visually noticeable when interacting.

Client Management - IT20625016 - Nanayakkara H.M.S.Y

- Password and confirmed password should be validated and display an error message before submitting the form.
- Phone numbers and email should be validated correctly. If not display relevant error messages before submitting the form
- Should be displayed The message delivered date and time and delivered state in the messaging section.
- Should not be displayed user password in the profile page and user can't update it. They can reset it in the forgot password page.

Admin Management – IT20631192 - Ekanayake E.M.S.D

- The user interface should provide a notification mechanism, allowing the system to report issues, and receive some notifications from the system.
- Video calls are available when needed. Its user interface should be considered.
- The user interface should have clear navigation and menu options, allowing the admin to easily access different features and functions of the system.

- The user interface should be easy to understand and use, with clear labels and icons that make it easy to navigate and find the required functions.

System Architecture

Since we were going through the MERN stack. requests that are coming from react frontend are handled by the Express.js backend, which interacts with the MongoDB database to retrieve and store data. We'll use MongoDB Atlas instead of deploying a traditional database persistence container because MongoDB Atlas was an integrated suite of data services centered around a cloud database also that provides us with mass scaling and high availability. Also, Atlas lets us deploy DB instances within most cloud providers. In this case, we used Azure in terms of making an all-in-one solution because our frontend and backend both will be deployed in the Azure app service. The frontend React.js component interacts with the backend REST APIs to render data and handle user interactions. The Keycloak IDP component provides authentication and authorization services to ensure that user access is secure and managed appropriately. Maintaining a separate user store with Keyclaok will be very easy to handle role-based access control (RBAC) and it will help us to manage each user session and handle their rate limiting as well. Since Keycloak has OIDC authorizations we can have a secured application according to the latest Oauth2 protocols. Also, verification SMS OTPs will be sent by Twillo SMS gateway which is the most consistent SMS gateway that uses across the globe. For sending emails for different business scenarios we use Gmail SMTP relay so then we can broadcast and unicast necessary information across the user store depending on the requirements.

High Level Architect Diagram
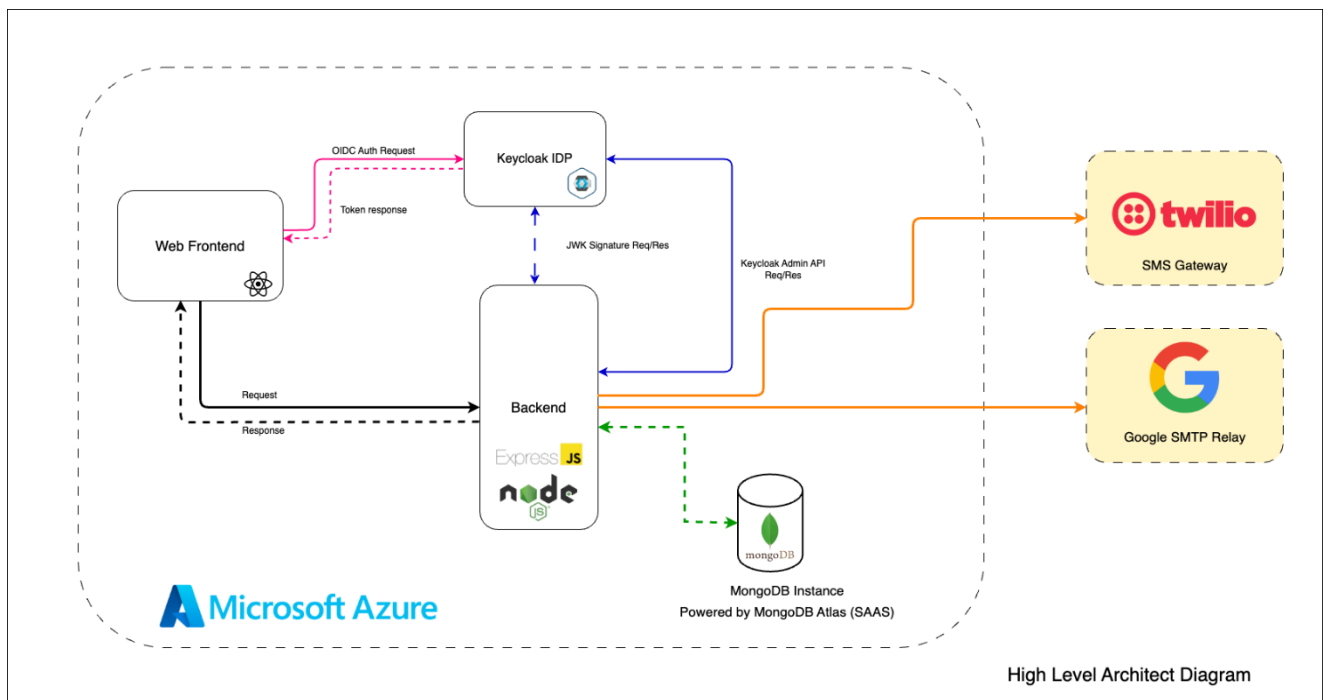
Data requirements

Article Management - IT20609658 - Perera M.R.A.

- Article Content: The system should store the content of the articles, including the title, author, summary, full text, and related keywords.
- Article Metadata: The system should store metadata about each article, including the publish date, last update date, and the number of views.
- Author Information: The system should store information about the authors, including their name, contact details, and area of expertise.

Consultant Management - IT20633790 - Rupasinghe S.P

- Consultant Information: The system should collect information about the consultants, including their names, specialty, contact information, and professional credentials.
- Consultant Reviews: The system may collect user reviews and ratings for each consultant, to help other users choose the best consultant for their needs.
- Consultant Availability: The system may allow consultants to set their availability status and should collect and store available times of consultants
- Communication Records: The system may keep a record of all communication between consultants and users, including messages, and chat logs.
- Complaints and Feedback: The system should provide a mechanism for users to submit complaints or feedback about the consultants or the services provided and store them.

Client Management - IT20625016 - Nanayakkara H.M.S.Y

- User account information such as first name, last name, email, phone number, address and password should be stored in the database Safely using data validation and encryption methods.
- User's sensitive data such as disease data, medication data medical histories are stored in a specific data collection using a very secure manner. That data only access can authorized parties only
- Always create a token using the user id and maintain the login state using this token. This token can be used in the authentication as well.
- When user deletes their user account, the user data not remove completely from the database. instead of that the data will store in different collection and the system admin or other authorized party can access these data if they need.

Admin Management – IT20631192 - Ekanayake E.M.S.D

- User Account Data: Account details are provided by the system. The data are store in the database.

- Consultant Data: The system should store data related to consultant profiles, including status (pending, approved, rejected, deleted), as well as the reason for deletion (by admin or by the consultant). This data can be used to track consultant profiles and manage consultant access permissions.
- Communication Data: The system should store communication data, including messages and video calls sent and received by the admin. This data can be used to track communication history and provide a record of interactions with users and consultants.
- Notification Data: The system should store data related to system notifications, including the content of the notification.

Performance requirements

Article Management - IT20609658 - Perera M.R.A.

- Response Time: The article management feature should respond to user requests quickly and efficiently
- Scalability: The article management feature should be able to handle a large number of articles and users without experiencing performance issues, and should be able to scale up as the platform grows.
- Concurrent Users: The article management feature should be able to handle a large number of concurrent users
- Database Performance: The database used by the article management feature should be optimized for performance.
- Image and Media Optimization: Images and media used in articles should be optimized for performance to reduce page load times and improve user experience.

Consultant Management - IT20633790 - Rupasinghe S.P

- Registration process should not be exceeded 15 seconds.
- Article content should be cached in order to make less retrieval time.
- If any interruption happened between video conversations it must be automatically connected when the network is available.
- Dashboard contents should be completely loaded within 4 seconds.
- Article images and other multimedia contents should be compressed before saving them into storage in order to reduce server bottlenecks and reduce retrieval time.

Client Management - IT20625016 - Nanayakkara H.M.S.Y

- The login process should take no longer than 10 seconds to complete. If login is successful user should navigate to the relevant page Otherwise, a notification should be displayed as to why the login failed.
- The system should be able to render the selected article on the user's device within 10 seconds.

- The chat display should update immediately if one person sends a message to another person.

Admin Management – IT20631192 - Ekanayake E.M.S.D

- Response time: The system should provide a fast response time for admin tasks, such as approving or rejecting consultants, sending messages, and managing articles. The response time should be within acceptable limits to ensure a smooth user experience.
- Scalability: The system should be able to handle a large number of users and data, as well as accommodate future growth. This includes the ability to add new features or modules, as well as support additional users or concurrent connections.
- Availability: The system should be available for use by the admin at all times, with minimal downtime or scheduled maintenance periods.
- Reliability: The system should be reliable and perform consistently over time. This includes minimizing the occurrence of errors or system failures and implementing data backup and recovery procedures to ensure data integrity.

Security requirements

Article Management - IT20609658 - Perera M.R.A.

- Authentication and Authorization: The article management feature should require strong authentication and authorization controls to ensure that only authorized users, such as consultants and platform admins, have access to sensitive data and functionalities.
- Access Controls: The article management feature should include access controls that limit user access to only those functionalities that they are authorized to use, and restrict access to sensitive data based on the user's role.
- User Account Management: The platform should include user account management features, such as password reset to ensure that user accounts are secure and protected against unauthorized access.
- Secure File Uploads: The platform should include secure file upload features to ensure that any uploaded files, such as images or media, are scanned for viruses or malware before they are published.
- Platform Backup and Disaster Recovery: The platform should have regular backups and a disaster recovery plan in place to ensure that data can be recovered in the event of a security breach or other disaster.

Consultant Management - IT20633790 - Rupasinghe S.P

- User credentials must transfer within the encrypted stream.
- User access tokens must be expired after 2 hours starting from token issuing.
- Session refresh tokens must be expired after 24 hours starting from token issuing.

- All user access tokens must follow the RBAC model and user functions should be available within the expected role only.
- Registration and login flows must be secured by 2Captcha in order to avoid automated registrations and spamming.
- Mobile number verification OTP failing attempt should be limited to 4 attempts. After that mobile number verification should be blocked for 15 minutes.
- Entering incorrect credentials more than 5 times should be caused to block login flow for 15 minutes.

Client Management - IT20625016 - Nanayakkara H.M.S.Y

- Password hashing method should be used when storing the passwords.
- Always use token-based authentication and authorization for secure login and routing.
- Validate the user entered data if they are valid and relevant.
- Always check the role logged in and validate the access permission when navigating.

Admin Management – IT20631192 - Ekanayake E.M.S.D

- Authentication and Authorization: The system should have a secure and robust authentication mechanism for admin login, and the admin should have appropriate authorization rights to access the system's various features.
- User Data Protection: The system should ensure the confidentiality and integrity of user data stored within the system, and user data should not be accessible by unauthorized individuals or entities.
- Access Control: The system should provide a way to restrict access to certain features or data based on the admin's role or level of access.
- Secure Communication: The system should use secure communication protocols to ensure the privacy and integrity of any data transmitted between the admin and the system, such as when sending and receiving messages or making video calls.

Testing requirements

Article Management - IT20609658 - Perera M.R.A.

- Functional Testing: The article management feature should undergo functional testing to ensure that it meets all functional requirements, such as article creation, editing, and search functionalities.
- Usability Testing: Usability testing should be conducted to ensure that the article management feature is user-friendly, intuitive, and meets the needs of both consultants and users.
- Security Testing: Security testing should be conducted to ensure that the article management feature is secure and meets all security requirements, such as authentication and authorization controls, access controls

- Integration Testing: Integration testing should be conducted to ensure that the article management feature integrates correctly with other platform features, such as user account management and reporting functionalities.
- User Acceptance Testing: User acceptance testing should be conducted to ensure that the article management feature meets the needs and expectations of end-users, such as consultants and platform users.

Consultant Management - IT20633790 - Rupasinghe S.P

- The system should be tested to make sure that article composing and editing working as expected.
- Text/Video based conversation should be tested to make sure it has connection establishment and consistency in conversation flow.
- Onboarding flows must be tested under all scenarios to ensure authorized users have access within the expected user scope and unauthorized users will not gain any of accessibility to access and modify data.
- Consultant's page editing flows must be tested to ensure profile details rendering is working as expected and whether it has expected responsiveness.

Client Management - IT20625016 - Nanayakkara H.M.S.Y

- User login and registration should be tested to ensure they work correctly and efficiently.
- All the navigation should be tested to ensure that unauthorized persons can be accessed it.
- Testing should also be conducted to ensure that error messages and notifications are displayed when the user entered incorrect details and passwords.
- Should be tested searched and filtered articles should be matched with the searched or filtered keywords.

Admin Management – IT20631192 - Ekanayake E.M.S.D

- User Management Testing: This can include testing the admin login functionality, verifying that an admin account cannot be created by regular users, and testing the validation of admin login credentials.
- Consultant Management Testing: This can include testing the consultant approval process, consultant rejection process, and consultant removal process. It can also include testing the ability of the administrator to manage consultant access permissions.
- Communication Management Testing: This can include testing the ability to send and receive messages to/from users and testing the video call functionality when necessary.
- Article Management Testing: This can include testing the ability to create, edit, and publish articles on the website. It can also include testing the functionality to view all articles in the website's feed.
- Notification Management Testing: This can include testing the broadcast system that informs users of the required details of the system.

- View Consultant Details Testing: This can include testing the ability of the administrator to view pending, approved, rejected, and deleted consultants. It can also include testing that the system shows the deleted account by admin separately and the system shows the deleted account by consultant themself separately.