

COMPLAINT RAISING WEBSITE

INTERDISCIPLINARY PROJECT

Submitted in partial fulfillment of the requirements for the award of
Bachelor of Technology in Information Technology

by

CALVIN NESAN S V (41120044)



DEPARTMENT OF INFORMATION TECHNOLOGY

SCHOOL OF COMPUTING

SATHYABAMA

INSTITUTE OF SCIENCE AND TECHNOLOGY (DEEMED
TO BE UNIVERSITY)

CATEGORY-1 UNIVERSITY BY UGC

Accredited "A++" by NAAC

12B Status by UGC | Approved by AICTE

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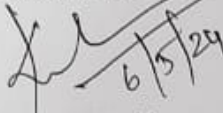
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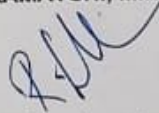
BONAFIDE CERTIFICATE

This is to certify that this Project Report is the bonafide work of **CALVIN NESAN S (41120044)** who carried out the project entitled "**COMPLAINT RAISING WEBSITE**" under my supervision from January 2024 to May 2024.


6/5/24

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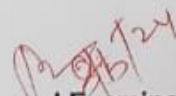
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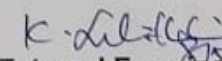


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DECLARATION

I, CALVIN NESAN S V (41120044) hereby declare that the Project Report entitled "COMPLAINT RAISING WEBSITE" done by me under the guidance of Dr. K.S. KAMATCHI, M.E., Ph.D., is submitted in partial fulfillment of the requirements for the award of Bachelor of Technology degree in Information Technology.

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I wish to express my thanks to all Teaching and Non-teaching staff members of the **Department of Information Technology** who were helpful in many ways for the completion of the project.

CERTIFICATE OF COMPLETION



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CERTIFICATE FOR INTERNSHIP

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This is to Certify that **CALVIN NESAN S V (Reg No: 41120044)** student of Sathyabama Institute of Science and Technology, B. Tech Information Technology, has successfully completed the Internship at Hackwit Technologies from 22nd January to 30th January 2024.

During the internship, **CALVIN NESAN S V** has closely worked as a part of the **React Full stack** by carrying out the project entitled "**SIST COMPLAIN RAISING APP**".

He demonstrated good developing and learning skill with self-motivated attitude to learn new things. His contribution to implement the React Full stack was good. We wish him all the best for his future endeavors.

Best Regards,

Ravikumar S
CEO & Managing Director
Hackwit Technologies Pvt Ltd



CERTIFICATE OF COMPLETION



ABSTRACT

The complaint raising application aims to solve a critical issue within educational institutions: providing an efficient, transparent, and reliable way for students to raise concerns and for administrators to manage and resolve them. The application is designed to address common pain points in complaint management, such as miscommunication, delays, and a lack of accountability. With the MERN stack at its core, the application leverages modern technologies to create a robust and scalable system. MongoDB, a NoSQL database, allows for flexible data storage and quick retrieval of complaint records. Express.js, a lightweight web framework, provides the backend infrastructure needed to handle user requests and manage business logic. React, a popular front-end library, ensures a responsive and interactive user experience, while Node.js serves as the runtime environment, allowing the application to handle concurrent requests efficiently. The application is designed with user roles in mind. Students have a secure login system where they can create accounts and submit complaints easily. They can categorize their complaints by type, such as academic, facilities, or harassment, and provide detailed descriptions to ensure that their concerns are understood. They can also attach supporting documents or images to strengthen their cases. The personalized student dashboard provides real-time updates on the status of their complaints, fostering a sense of involvement in the resolution process. Overall, the complaint raising application represents a significant step forward in addressing the challenges of complaint management in educational institutions. By promoting transparency, reducing administrative overhead, and ensuring efficient complaint resolution, the application contributes to a more harmonious and responsive environment. It empowers students to voice their concerns and holds administrators accountable for addressing them, fostering a culture of open communication and continuous improvement.

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CHAPTER 1

INTRODUCTION

Educational institutions often face challenges in managing student complaints efficiently and transparently. The complaint raising application addresses these challenges by offering a web-based platform where students can submit complaints and track their progress, while administrators can manage and resolve them effectively. The system uses modern web technologies to ensure scalability and security, providing a robust solution to improve accountability and communication within educational settings.

1.1 The Significance of complaint raising app

A complaint raising application is a crucial tool in educational institutions, businesses, and public services because it streamlines and improves the process of addressing complaints and concerns. Here's an explanation of the significance of such an application, emphasizing its role and impact on various stakeholders:

The significance of a complaint raising application lies in its ability to facilitate efficient, transparent, and organized communication between users and administrators, whether in educational institutions, businesses, or other organizations. These applications offer several key benefits that make them indispensable in modern environments where customer or user satisfaction and feedback play critical roles.

1.2 Current Challenges in complaint

The success of a complaint raising app depends on user adoption. Users may be reluctant to switch from traditional methods to a digital platform. They might be unaware of the app's benefits or find it difficult to navigate. Addressing this challenge requires effective user education, training, and a user-friendly interface. These applications handle sensitive information, including personal details and confidential complaints.

Ensuring robust data security is paramount. Challenges include implementing strong encryption, secure authentication, access controls, and compliance with data protection regulations like GDPR or CCPA. A breach of security can lead to a loss of trust and legal repercussions.

1.3 The Evolution of complaint raising app

Initially, complaint management relied on manual systems, typically involving paper forms, suggestion boxes, or verbal communication. These methods were prone to errors, misplacement of complaints, and a lack of transparency. Administrators found it challenging to track and resolve complaints efficiently. As internet usage became widespread, web-based complaint forms gained popularity. Users could submit complaints online, which were then stored in a centralized database. These systems improved accessibility and reduced paperwork. However, they often lacked advanced features like real-time tracking or automated workflows. With advancements in web technologies, complaint raising applications have become more sophisticated and user-friendly. Modern apps are built with robust frameworks like the MERN stack (MongoDB, Express.js, React, Node.js), enabling responsive interfaces and scalable backends. These apps offer features like real-time tracking, automated notifications, and comprehensive dashboards for administrators.

1.4 Importance of complaint raising app

While Complaint raising apps encourage open communication by providing users with a formal platform to express concerns or report issues. This open communication is vital for maintaining a healthy relationship between stakeholders and the organization. It fosters a culture where feedback is welcomed and acted upon. These applications promote transparency by allowing users to track the status of their complaints in real-time. This feature helps build trust, as users can see the progress being made on their complaints. Additionally, the digital record of complaint submissions creates accountability for administrators, who are responsible for addressing and resolving complaints within a given timeframe

1.5 Objectives of the Report

This report aims to provide comprehensive insights into the realm of complaint raising app in the digital age. By examining the current challenges in complaint security, exploring the evolution of complaint raising solutions, and emphasizing the importance of user education and awareness, the report seeks to equip organizations and individuals with the knowledge and resources needed to enhance user security. Furthermore, the report aims to offer actionable recommendations for mitigating the risks associated with complaint raising, thereby strengthening overall complaint posture in an interconnected world.

- Determine the need for the app by identifying existing challenges in complaint management that it aims to address.
- Explaining how it facilitates complaint raising and resolution, and the user roles it supports.
- Assess the app's impact on user experience, focusing on usability, efficiency, and how it streamlines complaint resolution processes.
- Provide actionable recommendations for enhancing security in organizations and individuals.
- Propose solutions to current challenges, and suggest areas for future improvement and potential feature expansions.

CHAPTER 2

METHODOLOGY

2.1 AIM OF THE PROJECT

The aim of the project is to design and develop a complaint raising application that provides a user-friendly, efficient, and secure platform for users to submit, track, and resolve complaints within an organization. The application is intended to improve communication, transparency, and accountability while automating and streamlining the complaint resolution process. This project aims to enhance user satisfaction by reducing response times, ensuring data security, and promoting a seamless workflow, ultimately contributing to a more responsive and effective complaint management system.

2.2 SCOPE OF THE PROJECT

Research and Analysis: Engage with potential users through surveys, interviews, or focus groups to gather their feedback on what they expect from a complaint raising app. This step helps identify desired features, common complaints, and suggestions for improvement.

User Requirements Gathering: User requirements gathering is a crucial phase in developing a complaint raising application, as it ensures the app meets the needs and expectations of its users. This process involves collecting detailed information from various stakeholders to understand their specific requirements, challenges, and preferences.

Design and Development: Utilize industry best practices and user-centered design principles to develop an intuitive and user-friendly interface for the complaint management system. Implement robust encryption algorithms and security protocols to ensure the confidentiality and integrity of stored complaints.

Multi-Platform Compatibility: Ensure compatibility across various platforms and devices, including web browsers, mobile devices, and desktop applications, to provide users with seamless access to their complaint wherever they are.

Integration with Existing Systems: Explore opportunities for integration with existing authentication systems and third-party services to enhance interoperability and streamline user workflows.

Usability Testing and Feedback: Conduct usability testing and gather feedback from users to iteratively improve the user experience and address any usability issues or pain points.

Scalability and Performance: Design the complaint management system with scalability and performance in mind to accommodate a growing user base and handle increased workload efficiently.

Security Measures: Implement advanced security measures such as multifactor authentication, biometric authentication, and password strength assessment to enhance the security of user accounts and protect against unauthorized access.

Documentation and Training: Provide comprehensive documentation and training materials to guide users on how to use the complaint management system effectively and adopt best practices for complaint.

Evaluation and Continuous Improvement: Implement continuous monitoring to track the app's performance and stability. This monitoring can include tracking system uptime, response times, and any incidents or errors. Incident tracking allows you to address technical issues promptly and minimize user disruption.

Research and Analysis: The development of a complaint raising application requires a comprehensive research and analysis phase. This phase begins with a thorough examination of existing literature, industry reports, and best practices in complaint management. The goal is to understand the current landscape, identify common challenges, and explore innovative solutions. The research aims to uncover key issues, such as inefficient complaint handling, lack of transparency, or inadequate communication channels. By analyzing current trends, we can determine the most effective approaches to address these issues in our complaint raising ap

User Requirements Gathering

To create an effective complaint raising application, it is crucial to understand the needs and expectations of the users. This is achieved through a combination of surveys,

interviews, and focus groups with stakeholders such as students, employees, and administrators. The objective is to gather detailed user requirements, understand their pain points, and identify desired features. By engaging with these stakeholders, we ensure that the app meets their specific needs and addresses common problems in the complaint resolution process.

Design and Development

The design and development phase focuses on creating an intuitive and user-friendly interface for the complaint raising app. This involves employing user-centered design principles to ensure the app is easy to navigate and accessible to users with varying levels of technical expertise. The development process follows agile methodologies, allowing for iterative design, prototyping, and refinement based on user feedback. Robust security measures, such as encryption and secure authentication, are implemented to protect user data and maintain privacy.

Testing and Evaluation

Once the complaint raising app is developed, it undergoes rigorous testing and evaluation to ensure functionality, usability, and security. Usability testing is conducted with real users to assess the app's ease of use and effectiveness in facilitating complaint submissions and tracking. Security audits and vulnerability assessments are performed to identify and address potential risks. Performance testing is conducted to evaluate the app's scalability and responsiveness under various load conditions.

Implementation Plan

An implementation plan is developed to guide the rollout of the complaint raising app. This plan outlines key milestones, deliverables, and deadlines, ensuring that resources, including personnel, time, and budget, are allocated appropriately. Regular progress monitoring and adjustments to the plan ensure timely completion and successful deployment.

Risk Management

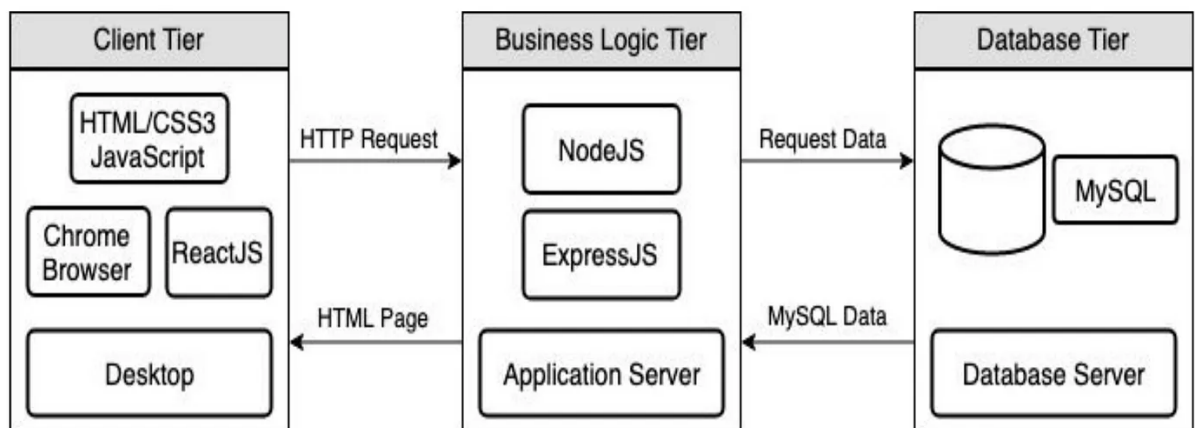
Risk management is a critical component of the project. Potential risks and challenges, such as technical constraints or resource limitations, are identified, and mitigation strategies are developed. Contingency plans are also established to address any issues that may arise during the implementation process, minimizing disruptions to project progress.

Validation and Verification

The final phase involves validating and verifying the effectiveness of the complaint raising app. This includes ensuring the app meets predefined criteria for performance, security, and usability. User feedback is collected to gauge satisfaction and identify areas for improvement. The validation process confirms that the app is functioning as intended and aligns with the project's objectives, while verification ensures the app meets quality standards.

2.3 ARCHITECTURE OVERVIEW

The architecture of the password management project is based on the MERN stack, which consists of MongoDB, Express.js, React.js, and Node.js. This stack provides a robust and scalable foundation for developing web applications with a modern and interactive user interface.



2.3.1 Frontend

The frontend of the application is built using React.js, a popular JavaScript library for building user interfaces. React allows for the creation of reusable UI components, making it easier to develop complex interfaces while maintaining a modular and maintainable codebase.

Explanation: React components are used to create the user interface elements of the password management application, including login/signup forms, password lists, and settings pages. These components are organized into a hierarchical structure, allowing for easy navigation and management of the application's UI.

2.3.2 Backend

The backend of the application is powered by Node.js, a runtime environment for executing JavaScript code outside of a web browser, and Express.js, a web application framework for Node.js. Express.js simplifies the process of building web servers and handling HTTP requests, making it ideal for developing RESTful APIs.

Explanation: Express.js is used to create RESTful API endpoints for handling user authentication, password management, and data storage. These endpoints interact with the MongoDB database to perform CRUD (Create, Read, Update, Delete) operations on user accounts and password records.

2.3.3 Database

The database used in the project is MongoDB, a NoSQL database that stores data in a flexible, JSON-like format called BSON (Binary JSON). MongoDB is well-suited for handling unstructured or semi-structured data and provides scalability and performance for web applications.

Explanation: MongoDB stores user account information, encrypted passwords, and other relevant data in collections within a database. Each user account is represented as a document in the "Users" collection, containing fields such as username, email,

hashed password, and salt. Password records are stored in the "Passwords" collection, linked to the corresponding user account.

2.3.4 Authentication and Security

Authentication in the application is implemented using JSON Web Tokens (JWT), a stateless authentication mechanism that securely transmits user information between the client and server. Passwords are hashed using bcrypt, a cryptographic hashing function, to protect against unauthorized access and data breaches.

Explanation: When a user logs in to the application, their credentials are verified against the stored hash of their password. Upon successful authentication, a JWT is generated and sent to the client, which is included in subsequent requests to authenticate the user's identity. This token is securely stored in local storage or cookies and used to access protected endpoints on the server.

2.3.5 Deployment

The application can be deployed to a cloud hosting platform such as AWS (Amazon Web Services), Heroku, or Azure for scalability, reliability, and accessibility. Continuous integration and deployment (CI/CD) pipelines can be set up using tools like GitHub Actions or Jenkins to automate the deployment process and ensure smooth delivery of updates to the production environment.

Explanation: The application is packaged into Docker containers for portability and consistency across different environments. These containers are deployed to a cloud-based infrastructure, where they can be scaled horizontally to handle increased traffic and load. Monitoring and logging tools such as Prometheus and Grafana are used to track application performance and diagnose any issues that may arise.

This architecture provides a solid foundation for building a secure, scalable, and user-friendly password management application using the MERN stack. It emphasizes best practices in frontend and backend development, authentication and security, database management, and deployment for a seamless user experience.

2.4 ALGORITHMS USED

In a password management project, several algorithms are typically employed to ensure secure storage, authentication, and data protection. Here are the key algorithms commonly used in such projects:

2.4.1 Password Hashing: Bcrypt is a widely used password hashing algorithm known for its resistance to brute-force attacks and its ability to mitigate rainbow table attacks. It incorporates a salt, which adds randomness to the hashing process and strengthens security.

2.4.2 Authentication Algorithm: Advanced The authentication algorithm ensures secure user login and access control. This typically involves hashing passwords with a secure hash function and comparing the hashed input with stored values to verify user credentials. Multi-factor authentication (MFA) can be integrated to enhance security.

2.4.3 Complaint Submission: Key Collect user input for the complaint details, such as description, category, and related evidence.

2.4.4 Complaint Assignment: Once a complaint is submitted, an assignment algorithm determines who will handle it. This algorithm might use a round-robin approach, workload balancing, or rules based on complaint type or severity. The goal is to ensure complaints are assigned to the appropriate personnel for resolution.

JSON Web Tokens Algorithm: JWT is often used for authentication in web applications. HMAC (Hash-based Message Authentication Code) algorithms like HMAC SHA-256 or RSA signatures are used to sign JWT tokens, ensuring their integrity and authenticity.

Search and Filtering Algorithm: Password This algorithm allows users to search and filter complaints based on specific criteria, such as date range, status, or assigned personnel. It typically involves query optimization to ensure efficient retrieval of results, even with large volumes of data.

2.5 AUTHENTICATION MODULE

Responsible for user authentication and authorization. Includes features such as user registration, login/logout, password reset, and session management. Utilizes JWT (JSON Web Tokens) for stateless authentication and secure transmission of user credentials.

User Management Module

Handles user profile management functionalities. Includes features such as profile editing, avatar upload, and account deletion.

Complaint Management Module

Core module responsible for managing user complaints and complaint-related operations.

Includes features such as complain storage, retrieval, updating, and deletion.

Implements encryption and hashing algorithms to securely store and manage complaints in the database.

Dashboard Module

Provides a dashboard interface for users to view and manage their complaints. Displays complaints lists, categories, and details, allowing users to organize and categorize their complaints effectively.

Supports features such as searching, filtering, and sorting complaints for easy access.

Settings Module

Allows users to customize application settings and preferences.

Includes features such as theme selection, language preference, and notification settings.

Provides an intuitive interface for users to manage their preferences and configure application behavior.

Security Module

Implements security-related features and functionalities to protect user data and prevent unauthorized access.

Includes features such as rate limiting, CAPTCHA verification, and HTTPS enforcement to mitigate security threats.

Integrates security best practices and techniques to ensure the confidentiality, integrity, and availability of user information.

API Module

Defines and implements RESTful APIs for communication between the frontend and backend components.

Handles HTTP requests and responses, routing, validation, and error handling.

Provides a clear and well-documented API interface for frontend developers to interact with backend services.

Database Module

Manages database interactions and data access operations.

Implements database models, queries, and transactions to interact with the MongoDB database.

Ensures data integrity, consistency, and security through proper data modeling and validation.

2.6 ADVANTAGES OF PROPOSED WORK

The proposed complaint raising application offers numerous advantages over traditional complaint handling methods. Here are some key benefits that illustrate why this application can be a significant improvement in complaint management:

The proposed complaint raising application offers numerous advantages over traditional complaint handling methods. Here are some key benefits that illustrate why this application can be a significant improvement in complaint management:

Improved Efficiency

The application streamlines the complaint raising process, allowing users to submit complaints quickly and easily. This leads to a reduction in response time and ensures that complaints are directed to the appropriate personnel or department without delay.

Enhanced Transparency

The application provides users with a clear view of the complaint resolution process. Users can track the status of their complaints in real-time, promoting accountability and transparency within the organization. This level of visibility can help build trust and confidence in the complaint handling system.

Centralized Management

A centralized system allows for consistent management of complaints. All complaint data is stored in a single location, making it easier to monitor, track, and analyze. This centralization facilitates efficient record-keeping, reduces the risk of lost or misplaced complaints, and enhances administrative control.

User-Friendly Interface

The user-centered design of the application ensures that it is intuitive and easy to navigate. A simple and accessible interface encourages users to submit complaints without hesitation, reducing barriers to participation and increasing user engagement.

Automation and Notifications

The application can automate various aspects of complaint handling, such as complaint assignment, status changes, and user notifications. Automated notifications keep users informed about the progress of their complaints, reducing the need for manual follow-up and ensuring timely communication.

Improved Accountability and Reporting

With a comprehensive reporting system, the application allows administrators to generate detailed reports on complaint trends, resolution times, and other key metrics. This capability supports better decision-making, enables data-driven improvements, and increases accountability within the organization.

Enhanced Security and Compliance

The application employs robust security measures to protect sensitive data and ensure compliance with data protection regulations. Encryption, secure authentication, and regular security audits help safeguard user information and maintain the integrity of the system.

Scalability and Flexibility

The application is designed to scale with the organization's growth. It can handle an increasing number of users and complaints without sacrificing performance. The flexible design also allows for customization and the addition of new features as the organization's needs evolve.

Reduced Operational Costs

By automating many aspects of complaint handling and reducing manual processes, the application can lead to cost savings. It minimizes the need for extensive administrative resources, reducing operational costs over time.

Better Customer/User Experience

Ultimately, the application aims to improve the overall experience for users. A streamlined complaint handling process, clear communication, and timely resolution contribute to higher satisfaction levels and a more positive perception of the organization.

CHAPTER 3

RESULTS AND DISCUSSION

i) FRONTEND

Index.js: An index.js file in a Node.js-based application often serves as the main entry point for the application, where you set up key components like server initialization, middleware, database connections, and routing. Here's a breakdown of a typical index.js file in a MERN (MongoDB, Express, React, Node.js) stack

Login page.js: A login page is the gateway for users to access a web application's secure content. It typically consists of simple elements designed to facilitate easy user authentication. At its core, a login page has a text field where users enter their username or email address and another field for their password. The password field is designed to keep the entered text hidden for security. After entering these details, users click a "Login" button to submit the information for authentication.

If users forget their password, there's usually a "Forgot Password" link that guides them through a recovery process. For new users, a "Create Account" or "Sign Up" link redirects them to a registration page to create a new account.

Signup page.js: A signup page is designed to gather the necessary information to create a new user account. It generally includes fields for the user's name, email address, and a password, with additional fields like a phone number or username, depending on the application's requirements. The password field is secure, displaying dots or asterisks to keep the password hidden. To ensure that users don't make errors while typing, there might be a "Confirm Password" field, where users re-enter their password to validate it. A "Sign Up" button is provided to submit the form and create the account.

Home page.js: The homepage is the central hub of a website, designed to capture users' attention and provide a clear sense of purpose and direction. It often features a

clean, visually appealing layout with easy navigation. At the top, a prominent header usually contains the website's logo, title, or branding elements. This section may also include a navigation bar with links to important pages like "About Us," "Services," "Contact," and other relevant sections.

Complain page.js: A complaint form page allows users to submit complaints, grievances, or reports to an organization. It is designed to be simple and intuitive, enabling users to provide detailed information about their complaint without confusion. Here's a detailed description of a typical complaint form page:

The complaint form page is a dedicated section of a website or application where users can submit their complaints or issues. The page typically starts with a brief introduction, explaining the purpose of the form and any guidelines for submitting a complaint. This introduction might include information on the types of complaints accepted, response times, and confidentiality policies.

User dashboard.js: The user dashboard is designed to be a convenient and informative space where users can manage their account and interact with the core functionalities of the complaint-raising app. It usually features a clean, user-friendly interface with clear navigation, allowing users to quickly find the information they need.

Upon accessing the user dashboard, users are typically greeted with a summary view, showcasing their recent activity or important updates. In the context of a complaint-raising app, this summary might include an overview of the user's submitted complaints, showing the most recent complaints and their current status (e.g., "Pending," "In Progress," "Resolved").

Admin dashboard.js: The admin dashboard in a complaint-raising app is designed to provide administrators with an efficient and organized interface to manage the app's operations. It typically offers a detailed overview of the complaints and user-related information, along with tools for resolving issues and maintaining system functionality.

Upon accessing the admin dashboard, administrators are often greeted with a high-level summary of key metrics and data points. This might include the total number of complaints, a breakdown of complaints by category, and an indication of their current status (such as "Pending," "In Progress," or "Resolved"). This summary allows admins to quickly understand the current state of the app and prioritize their tasks.

ii)BACKEND

Before writing any code, ensure you have Node.js and npm (Node Package Manager) installed on your system. You might also need a development environment like Visual Studio Code for writing and managing your code.

Start by creating a new directory for your project and initializing a Node.js environment

CONFIGURE: Configuration for a complaint-raising app's backend involves setting up environment variables, database connections, middleware, and other necessary settings to ensure smooth operation and security. Here's a detailed overview of how to configure a backend for a complaint-raising app using the MERN stack (MongoDB, Express, React, Node.js):

Environment variables are used to keep sensitive information secure and make your code adaptable to different environments (development, testing, production). Create a .env file in your project directory to store these variables.

In the main server file (e.g., index.js), use the dotenv package to load environment variables and set up the connection to MongoDB using mongoose.

Middleware is used in Express to process requests and add functionality like parsing JSON bodies, handling CORS, and more. Configure the middleware in index.js.

Routes define the endpoints for your backend and determine how different requests are handled. Configure routes for user authentication, complaint handling, and any additional features you need.

CHAPTER 4

CONCLUSION AND FUTURE WORK

4.1 CONCLUSION

The complaint-raising app project has successfully addressed the need for an efficient, user-friendly, and secure platform where users can submit complaints and administrators can manage them effectively. By utilizing the MERN stack, we have created a robust system that integrates modern technologies and best practices in web development and cybersecurity.

Throughout the project, several key outcomes have been achieved. Firstly, the app's design and functionality allow users to submit complaints seamlessly through an intuitive interface. The user dashboard provides a personalized experience, enabling users to track the status of their complaints and communicate with administrators as needed. The admin dashboard, on the other hand, facilitates efficient complaint management with tools for assigning tasks, monitoring progress, and generating reports.

Secondly, the project incorporates strong security measures, including JWT-based authentication, secure password hashing, and role-based authorization. This ensures the confidentiality and integrity of user data, while also preventing unauthorized access to sensitive information. The use of MongoDB as the backend database offers scalability and flexibility, allowing the app to handle increased user activity without compromising performance.

Furthermore, the project demonstrates the importance of continuous improvement. We implemented agile development methodologies to gather user feedback and iterate on the design, ensuring that the app meets the needs of its users. The iterative approach also allowed us to identify and address potential issues early in the development process, resulting in a more stable and reliable final product.

Looking ahead, there are several opportunities for further development and enhancement. Future work could focus on expanding the app's features, such as integrating real-time notifications, enabling multi-language support, and incorporating advanced analytics to gain insights into complaint trends. Additionally, collaborations with other departments or external organizations could enhance the app's impact by providing a broader platform for users to raise concerns and contribute to positive change.

In conclusion, the complaint-raising app project has successfully met its objectives, delivering a functional, secure, and scalable platform for complaint management. The collaborative efforts of the development team, along with user feedback and continuous improvement, have been instrumental in achieving this outcome. We are confident that the app will contribute to a more responsive and efficient complaint resolution process, benefiting both users and administrators alike.

4.2. FUTURE WORK

Enhanced User Interaction and Feedback

Expanding user interaction features can significantly improve the app's usability and engagement. This could include:

Real-Time Notifications: Implement real-time notifications to inform users of status changes, responses, or important updates regarding their complaints.

In-App Messaging: Allow users to communicate with administrators or customer service representatives directly through the app.

Feedback and Ratings: Provide users with the ability to rate their complaint resolution experience and leave feedback, aiding continuous improvement.

Advanced Analytics and Reporting

Introducing advanced analytics can help administrators gain insights into complaint trends and improve response times:

Complaint Analytics Dashboard: A comprehensive dashboard that visualizes complaint statistics, such as types of complaints, resolution times, and user satisfaction.

Predictive Analytics: Use machine learning techniques to predict common complaint patterns, allowing proactive measures to prevent future issues.

Integration with External Systems

Integrating the complaint-raising app with external systems can expand its reach and utility:

Integration with Customer Relationship Management Tools: Enable a seamless flow of complaint-related information to CRM systems, enhancing customer service and record-keeping.

Integration with Social Media Platforms: Allow users to submit complaints or share their experiences through social media, promoting transparency and accountability.

Multi-Language Support and Accessibility

Expanding the app's accessibility and language support can increase its user base and inclusivity:

Multi-Language Support: Offer the app in multiple languages, catering to a diverse user base and improving user experience for non-English speakers.

Accessibility Features: Implement features that support users with disabilities, such as screen readers, adjustable text sizes, and high-contrast modes.

Enhanced Security and Compliance

Given the sensitive nature of complaint data, enhancing security and ensuring compliance with industry standards is crucial:

Two-Factor Authentication (2FA): Introduce 2FA to add an extra layer of security during user authentication.

Data Encryption at Rest: Ensure that all sensitive data stored in the database is encrypted, protecting it from unauthorized access.

Compliance with Regulations: Adhere to data protection regulations such as GDPR or CCPA, ensuring the app complies with relevant legal requirements.

Scalability and Performance Improvements

As the user base grows, scalability becomes a critical consideration:

Microservices Architecture: Consider transitioning to a microservices architecture for improved scalability and maintainability.

Load Balancing and Distributed Systems: Implement load balancing and other distributed system techniques to ensure high availability and responsiveness during peak usage.

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APPENDICES

A.SAMPLE CODE

i)App.js

```
5  import Policy from './pages/Policy';
6  import Contact from './pages/Contact';
7  import Pagenotfound from './pages/Pagenotfound';
8  import Home from './pages/Home';
9  import Register from './pages/auth/Register';
10 import Login from './pages/auth/Login';
11 import Dashboard from './pages/user/Dashboard';
12 import Private from './component/Routes/Private';
13 import Forgetpass from './pages/auth/Forgetpass';
14 import Adminroute from './component/Routes/Adminroute';
15 import Admin from './pages/admin/Admin';
16 import Post from './pages/admin/Posts/Posts';
17 import Formm from './pages/user/Form/Form'
18
19
20 function App() {
21   return (
22     <>
23
24     <Routes>
25       <Route path="/" element={<Home/>}/>
26       <Route path="/login" element={<Login/>}/>
27       <Route path="/register" element={<Register/>}/>
28       <Route path="/dashboard" element={<Private/>}>
29         <Route path="user" element={<Formm/>}/>
30       </Route>
31
32       <Route path="/dashboard" element={<Adminroute/>}>
33         <Route path="admin" element={<Post/>}/>
34       </Route>
35
36       <Route path="/about" element={<About/>}/>
37       <Route path="/forget-password" element={<Forgetpass/>}/>
38       <Route path="/policy" element={<Policy/>}/>
39       <Route path="/contact" element={<Contact/>}/>
40       <Route path="*" element={<Pagenotfound/>}/>
41     </Routes>
```

ii)Package.json

```
{
  "name": "front",
  "version": "0.1.0",
  "private": true,
  "dependencies": {
    "@testing-library/jest-dom": "^5.17.0",
    "@testing-library/react": "^13.4.0",
    "@testing-library/user-event": "^13.5.0",
    "axios": "^1.6.8",
    "context": "^3.0.29",
    "react": "^18.2.0",
    "react-dom": "^18.2.0",
    "react-file-base64": "^1.0.3",
    "react-icons": "^5.0.1",
    "react-router-dom": "^6.22.3",
    "react-scripts": "5.0.1",
    "react-toastify": "^10.0.5",
    "validator": "^13.11.0",
    "web-vitals": "^2.1.4"
  },
   Debug
  "scripts": {
    "start": "react-scripts start",
    "build": "react-scripts build",
    "test": "react-scripts test",
    "eject": "react-scripts eject"
  },
  "eslintConfig": {
    "extends": [
      "react-app",
      "react-app/jest"
    ]
  },
  "browserslist": {
    "production": [
      ">0.2%",
      "not dead",

```

iii)Server.js

```
const express=require('express');
const colors=require('colors');
const dotenv=require('dotenv');
const conn=require('../backend/config/db')
const jsonweb=require('jsonwebtoken');
const model=require('../backend/model/usermodule');
const rt=require('../backend/route/authroute');
const cors=require('cors')

dotenv.config();
const app=express();
app.get('/',(req,res)=>{
  res.send('<h1>hello folks</h1>')
})

PORT=process.env.PORT;

app.use(cors());
app.use(express.json());

app.use('/',rt);
app.listen(PORT,()=>{
  console.log(`server running on ${PORT}`.bgCyan.white)
})
```

iv)Package.json

```
const express=require('express');
const colors=require('colors');
const dotenv=require('dotenv');
const conn=require('../backend/config/db')
const jsonweb=require('jsonwebtoken');
const model=require('../backend/model/usermodule');
const rt=require('../backend/route/authroute');
const cors=require('cors')

dotenv.config();
const app=express();
app.get('/',(req,res)=>{
  res.send('<h1>hello folks</h1>')
})

PORT=process.env.PORT;

app.use(cors());
app.use(express.json());

app.use('/',rt);
app.listen(PORT,()=>{
  console.log(`server running on ${PORT}`.bgCyan.white)
})
```

v)Middleware

backend > middleware >  authmiddle.js > ...

```
1  const jwt=require('jsonwebtoken');
2  const dotenv=require('dotenv');
3  const uservin=require('../model/usermodule')
4  dotenv.config();
5
6  const requiresignin=async(req,res,next)=>{
7      try{
8          const decode=jwt.verify(req.headers.authorization,process.env.KEY);
9          req.user=decode;
10         next();
11     }
12     catch(error){
13         console.log(error);
14     }
15 }
16
17
18 const isadmin=async(req,res,next)=>{
19     try{
20         const user=await uservin.findById(req.user._id);
21         if(user.role!==1){
22             return res.status(401).send({
23                 success:false,
24                 message:"unauthorized access",
25             });
26         }
27         else{
28             next();
29         }
30     }
31     catch(error){
32         console.log(error);
33     }
34 }
35
36
37 module.exports={requiresignin,isadmin}
```

B.SCREENSHOTS

i)Register and login

SIST COMPLAIN

HOME REGISTER LOGIN

register

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SIST COMPLAIN

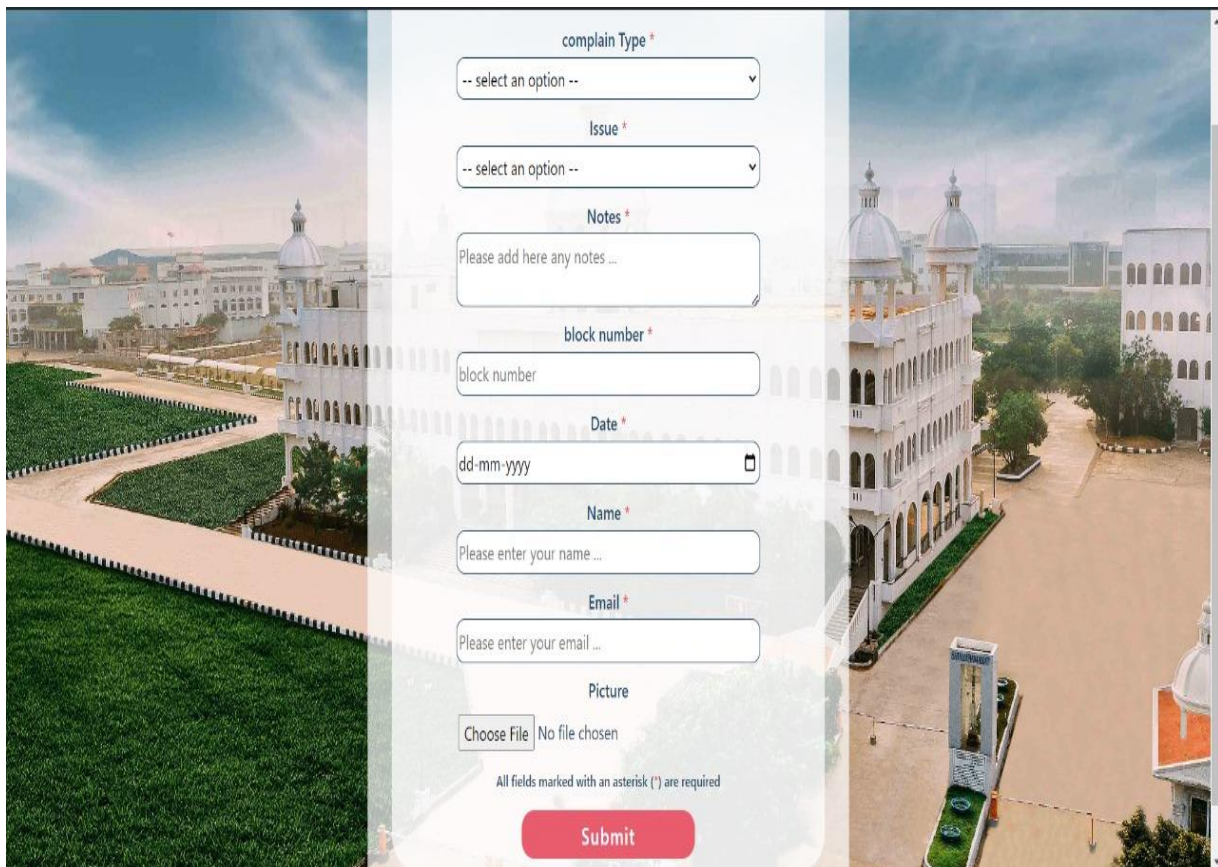
HOME REGISTER LOGIN

login

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ii)complaint page



complain Type *

-- select an option --

Issue *

-- select an option --

Notes *

Please add here any notes ...

block number *

block number

Date *

dd-mm-yyyy

Name *

Please enter your name ...

Email *

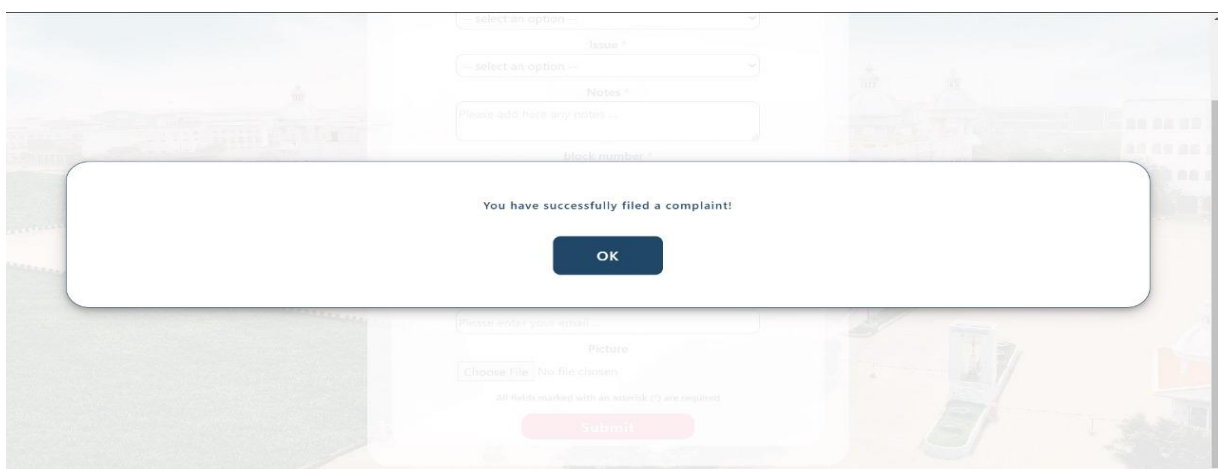
Please enter your email ...

Picture

Choose File No file chosen

All fields marked with an asterisk (*) are required

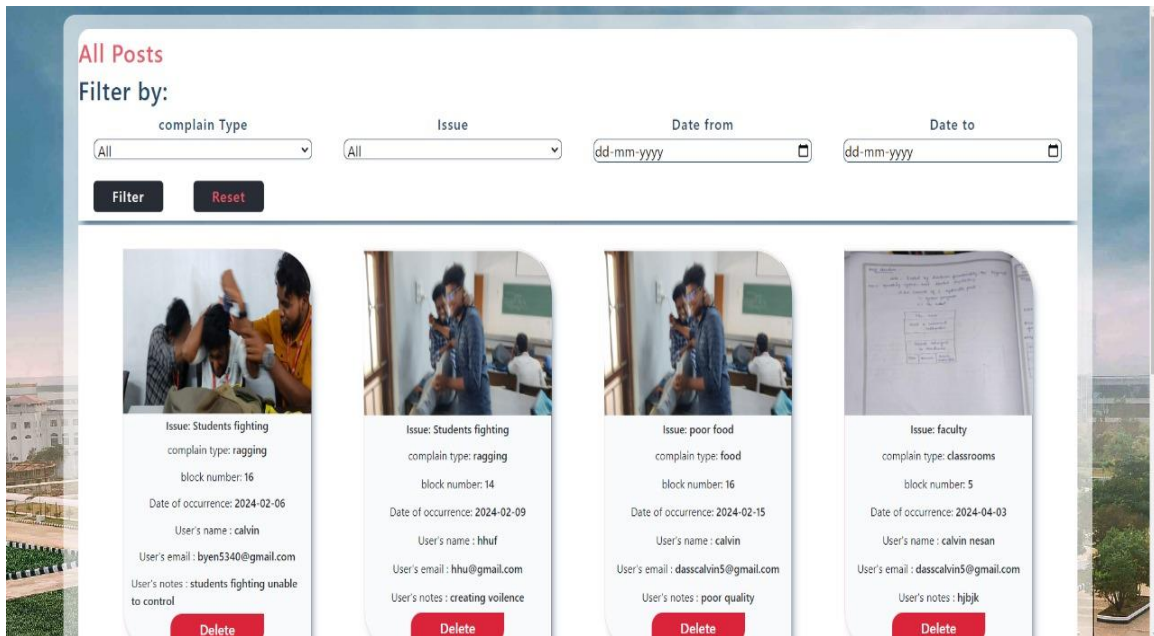
Submit



You have successfully filed a complaint!

OK

iv)Admin page



v)Database

