Project Report

On

Tax verification using QR code

Submitted in partial fulfillment for the award of

Diploma in Advance Computing from C-DAC Noida



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1. Introduction of Project:

In today's rapidly evolving digital landscape, the integration of innovative technologies has become imperative for enhancing efficiency and transparency in various sectors, including taxation. One such advancement is the incorporation of QR code technology into tax verification systems, revolutionizing the way individuals interact with tax authorities. This system comprises both an administrative and user module, designed to streamline the tax payment process while ensuring security and convenience for taxpayers.

The user module offers a seamless experience, allowing individuals to sign up and sign in using unique credentials, ensuring the confidentiality and integrity of their personal information. Once authenticated, users gain access to a comprehensive platform where they can submit their tax details efficiently. This module is built using React, a powerful JavaScript library known for its responsiveness and flexibility, ensuring a smooth and intuitive user interface. Upon submission of tax details, the administrative module, developed using Spring Boot, a Java-based framework renowned for its robustness and scalability, comes into play. Here, tax calculations are performed based on the provided information, taking into account relevant tax laws and regulations. Once calculated, the system generates a QR code containing the user's tax details, thereby simplifying the verification process.

The utilization of QR codes in tax verification adds an extra layer of security and efficiency. These codes contain encrypted data pertaining to the user's tax obligations, ensuring the integrity of the information while facilitating quick and convenient access. Users can simply scan the QR code using their smartphones or other compatible devices to view their tax details instantly.

Furthermore, the system supports online payment methods, enabling users to fulfill their tax obligations conveniently. Upon successful payment, the administrative module receives instant notification, allowing tax authorities to track transactions in real-time. This enhances transparency and accountability, fostering trust between taxpayers and authorities. Additionally, the user module provides access to a profile section where individuals can manage their personal information, track payment history, and access relevant documents. This feature enhances user experience by providing a centralized platform for tax-related activities, empowering individuals to stay informed and in control of their financial obligations.

Overall, the incorporation of QR code technology into the tax verification system represents a significant step towards modernizing tax administration processes. By leveraging React, Spring Boot, and MySQL, the system offers a robust and user-friendly solution that not only simplifies tax compliance for individuals but also enhances efficiency and transparency for tax authorities.

1.1 Aim of Project

The aim of this project is to develop a streamlined and efficient tax verification system that leverages QR code technology to simplify the process for both users and administrators. Through a user-friendly interface built with React, users will be able to securely sign up and sign in with unique credentials, enabling them to seamlessly apply for tax payments by providing their relevant details. Upon submission, administrators, powered by a Spring Boot backend and MySQL database, will calculate the user's tax liability and generate a QR code containing the necessary payment details. Users can then conveniently scan the QR code to access their tax information and proceed with online payment methods. Furthermore, users will have access to their profiles, allowing them to monitor their tax history and details. With this system, the aim is to enhance the efficiency, transparency, and user experience of tax payment processes while providing administrators with tools for seamless transaction management and oversight.

1.2 Objectives of the Project

Objectives of the Tax Verification System incorporating QR code technology:

- 1. **Efficient Tax Payment Process**: Simplify the tax payment process for users by providing a digital platform where they can easily apply for tax payments and make payments using online methods.
- 2. **Secure User Authentication**: Ensure secure authentication for users by implementing unique credentials for signing up and signing in, thereby safeguarding their personal and financial information.
- 3. **Accurate Tax Calculation**: Develop an admin module capable of accurately calculating users' taxes based on their provided details, ensuring fairness and transparency in tax assessment.
- 4. **QR Code Generation**: Integrate QR code technology to generate unique QR codes containing tax details for each user, facilitating easy retrieval and verification of tax information.
- 5. **Online payment integration**Integrate secure online payment methods to enable users to pay their taxes seamlessly through the platform, enhancing convenience and accessibility.
- Scalability and Flexibility: Design the system to be scalable and flexible, capable of
 accommodating future enhancements and adapting to changing tax regulations and user
 requirements.

1.3 Scope of the Project

The scope of the project involves the development of a tax verification system integrating QR code technology, comprising both an admin and user modules. Users will have the ability to register and sign in with unique credentials, granting them access to apply for tax payments by submitting their relevant details. Upon submission, the admin module will calculate the user's tax obligations and generate a QR code containing the tax details. Users can then scan this QR code to view their tax information and proceed with online payment methods. Upon successful payment, notifications will be sent to the admin, who can then access transaction details for verification. Additionally, users will have the capability to view and manage their profiles within the system. The technology stack for this project will include React for the frontend interface, Spring Boot for backend development, and MySQL for database management. This system aims to streamline the tax payment process, enhance the user experience, and provide efficient administration of tax transactions.

2. Proposed Methodology

The proposed methodology for the tax verification system incorporating QR code technology involves the development of an integrated admin and user module utilizing React for the front-end, Spring Boot for the back-end, and MySQL for database management. The system begins with user authentication, allowing users to sign up or sign in with unique credentials. Once logged in, users can apply for tax payments by providing their details. The admin module calculates the user's tax based on the provided information and generates a QR code containing the tax details. Users can then scan the QR code to view their tax information and proceed with online payment using various payment methods. Upon successful payment, the admin receives a notification and can access transaction details for verification purposes. Additionally, users have the capability to view and manage their profiles within the system. This methodology ensures a streamlined process for tax payment and verification, enhancing user convenience while providing efficient administrative oversight. The utilization of QR code technology adds an extra layer of security and convenience, simplifying the payment process for users while ensuring accuracy and transparency in tax transactions.

2.1 Proposed System

The proposed tax verification system integrates cutting-edge QR code technology to streamline the tax payment process efficiently. Comprising both user and admin modules, the system ensures a secure and user-friendly experience. Users are provided with unique credentials for signing up and signing in, granting them access to their personalized profiles. Within their profiles, users can input their tax details and apply for payment seamlessly. Upon submission, the admin module takes charge of calculating the user's tax liability accurately. Once calculated, the system generates a QR code containing all pertinent tax information. Users can then scan this QR code using their devices to instantly view their tax details and proceed with payment through various online methods supported by the system.

Furthermore, the system facilitates real-time notifications to the admin upon successful payment transactions, ensuring transparency and accountability. Admins can easily monitor and track transaction details, maintaining a comprehensive record of all tax payments made through the system. Powered by React for the frontend, Spring Boot for the backend, and MySQL for database management, the system offers robustness, scalability, and reliability. With its intuitive interface and seamless integration of QR code technology, the proposed system aims to revolutionize tax payment processes, enhancing efficiency and convenience for both users and administrators alike.

2.2 Advantages of Proposed System

- 1. Enhanced Efficiency: By leveraging QR code technology, the system streamlines the tax payment process, reducing the time and effort required for both users and administrators. Users can quickly access their tax details and make payments with just a simple scan, eliminating the need for manual data entry and paperwork.
- 2. Improved User Experience: With a user-friendly interface and intuitive design, the system provides a seamless experience for users. The ability to sign in with unique credentials and access personalized profiles enhances user satisfaction and engagement.
- 3. Accuracy and Transparency: The system's automated calculation of tax liabilities ensures accuracy and consistency in tax assessment. Additionally, real-time notifications to administrators upon payment transactions promote transparency and accountability in the tax collection process.
- 4. Secure Transactions: The integration of online payment methods ensures secure transactions, safeguarding users' financial information and reducing the risk of fraud or unauthorised access.
- 5. Comprehensive Tracking and Reporting: Administrators have access to comprehensive tracking and reporting features, allowing them to monitor tax payments, view transaction details, and generate reports as needed. This enhances administrative oversight and facilitates compliance with regulatory requirements.
- 6. Scalability and Flexibility: Built on robust technologies like React, Spring Boot, and MySQL, the system is highly scalable and adaptable to accommodate growing user demands and evolving tax regulations. It can easily be customized and extended to meet the unique needs of different tax jurisdictions or user groups.

3. Hardware & Software Requirements

Hardware:

1. Processor: Intel Core i3 or more.

2. RAM: 4GB or more.

3. Hard disk: 250 GB or more.

Software:

1. Operating System: Windows 10, 7, 8.

- 2. Visual Studio Code, Eclipse IDE.
- 3. React, Spring Boot.
- 4. MYSQL.

3.1 Technologies Used

1. React:

- React is a JavaScript library for building user interfaces, developed by Facebook. It allows developers to create interactive UI components for web applications.
- React follows a component-based architecture where UIs are composed of reusable and independent components, making it easier to manage complex UIs.
- It uses a virtual DOM (Document Object Model) to optimise rendering performance, only updating the parts of the UI that have changed.
- React supports server-side rendering, enabling faster initial page loads and improved
 SEO (Search Engine Optimisation) for web applications.
- It has a large and active community, with extensive documentation, tutorials, and thirdparty libraries available for developers.

2. Spring Boot:

- Spring Boot is an open-source Java framework for building enterprise-grade applications.
 It provides a streamlined and opinionated approach to building production-ready applications.
- It simplifies the development process by providing out-of-the-box features such as autoconfiguration, embedded servers, and dependency management.
- Spring Boot is based on the Spring Framework, leveraging its core features such as dependency injection, aspect-oriented programming, and MVC (Model, View, Controller) architecture.
- It promotes convention over configuration, reducing boilerplate code and allowing developers to focus on business logic.
- Spring Boot integrates seamlessly with other Spring projects and third-party libraries,
 enabling developers to build robust and scalable applications efficiently.

3. **MySQL**:

- MySQL is an open-source relational database management system (RDBMS) known for its reliability, scalability, and performance.
- It uses SQL (Structured Query Language) for querying and managing data stored in relational tables.
- MySQL supports ACID (Atomicity, Consistency, Isolation, Durability) properties, ensuring data integrity and reliability.
- It offers various storage engines, each optimised for different use cases, such as InnoDB for transactional workloads and MyISAM for read-heavy workloads.
- MySQL provides features such as replication, clustering, and backup/restore capabilities for high availability and disaster recovery.
- It is widely used in web development, powering many popular websites and web applications, thanks to its ease of use, performance, and cost-effectiveness.

4. Planning & Estimation

4.1 Software Development Life Cycle

The entire project spanned for a duration of 6 months. In order to effectively design and develop a cost-effective model the Waterfall model was practiced.

4.2 Requirement Gathering & Analysis Phase

This phase started at the beginning of our project, we had formed groups and modularized the project. Important points of consideration were

- 1. Define and visualize all the objectives clearly.
- 2.Gather requirements and evaluate them Consider the technical requirements needed and then collect technical specifications of various peripheral components (Hardware) required.
- 3. Analyze the coding languages needed for the project.
- 4. Define coding strategies.
- 5. Analyze future risks / problems.
- 6. Define strategies to avoid these risks else define alternate solutions to these risks.
- 7. Check financial feasibility.
- 8. Define Gantt charts and assign time span for each phase.

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4.3 Feasibility Study

This system is possible for all health care department like educational institutes, multinational companies etc. and this method can use while not specialists in this field anyone can use who have data concerning using online services which is able to facilitate to use this method any generation folks can use this method in laptop

4.4 Technical Feasibility

The framework ought to be assessed from the specialized reason for read first the evaluation of this practicability ought to be upheld a rundown kind of the framework interest inside the provisions of info yield projects and techniques having known an outline framework the examination ought to keep up to suggest the kind of pack required approach building up the framework of running the framework whenever it has been planned

- Technical issues raised during the investigation are:
- Is the existing technology sufficient for the suggested one?
- Can the system expand if developed?

the undertaking should be created indicated the predetermined capacities and execution are accomplished among the limitations the task is created among most recent innovation through the innovation may become old once some measure of some time due to the specific undeniable truth that never form of same code upholds more seasoned variants the framework should in any case be utilized hence there are marginal imperatives included this task the framework has been created exploitation java the undertaking is in fact feasible for advancement.

4.5 Economic Feasibility

The creating framework ought to be even by worth and benefit. Measures to confirm that exertion is focused on a project, which may give best, come at the most punctual. one through and through the variables that affect the occasion of a new framework, is that the value it'd need. The following are assortment of the necessary cash questions asked all through starter examination:

- The costs conduct a full system investigation.
- The cost of the hardware and software.

The benefits in the form of reduced costs or fewer costly errors.

Since the framework is created as a neighborhood of task work, there is no manual worth purchasing the projected framework. Furthermore, every one of the assets are as of now available, it offers an image of the framework is financially feasible for improvement.

4.6 Behavioral Feasibility

This incorporates the following inquiries:

- Is there agreeable help for the clients?
- Will the arranged framework cause hurt?

The venture would be useful as an aftereffect of fulfilling the goals once created and introduced. All social perspectives are considered cautiously and presume that the undertaking is typically conceivable.

4.7 Risk Analysis Process

Notwithstanding the obstacle strategies utilized potential perils is in a position to which can arise inside or outside the affiliation ought to be assessed regardless of the established truth that the exact arrangement of expected catastrophes or their after results district unit delayed to outlined its valuable to play out an intensive risk investigation of all threats which can sensibly happen to the relationship in spite of the kind of peril the goals of business recuperating emerging with locale unit to validate the security of buyers workers and particular representatives eventually of and following a breakdown the overall probability of a failure happening should be settled things to appear at in urgent the probability of a particular breakdown should be constrained to represent in any case not be confined to field characteristic study of the planet closeness to indispensable wellsprings of power streams and air terminals level of receptiveness to workplaces inside the affiliation history of local service organizations in giving persistent kinds of help history of the spaces condition to standard risks neighborhood to imperative turnpikes that vehicle bold waste and combustible item. Potential openings could even be delegated regular, specialized, or human dangers. Models include:

- **Characteristic** Threats: inner flooding, outer flooding, interior hearth, outside chimney, seismic movement, high breezes, snow and ice storms, emission, cyclone, typhoon, pandemic, torrent, hurricane.
- **Specialized Threats:** power disappointment/variance, warming, ventilation or air con disappointment, glitch or disappointment of hardware, disappointment of framework code, disappointment of use code, broadcast communications disappointment, gas spills, interchanges disappointment, atomic aftermath.
- **Human Threats:** robbery, bomb dangers, theft, blackmail, thievery, defacing, psychological warfare, common problem, synthetic spill, damage, blast, war, natural pollution, radiation

tainting, perilous waste, vehicle crash, airdrome nearness, strike (Internal/External), PC wrongdoing.

All areas and offices should be encased inside the peril investigation maybe than attempting to sort out real prospects of every fiasco an overall relative game plan of high medium and low is utilized at first to distinguish the probability of the danger happening the possibility investigation also need to affirm the effect of such a likely danger on various capacities or offices inside the association a risk analysis type discovered here pdf format will work with the strategy the capacities or divisions can shift by kind of association the arranging strategy ought to set up and live the possibility of every single expected danger and in this way the effect on the association if that danger happened to attempt to this each division should be investigated severally in spite of the fact that the chief framework is furthermore the one most serious danger it isn't the solitary vital concern indeed even inside the first programmed associations a few offices will not be handled or programmed inside the smallest degree in totally programmed divisions essential records stay outside the framework as lawful records pc information programming bundle hang on diskettes or supporting documentation for data section the effect is evaluated as 0 no effect or break in tasks 1 noticeable effect break in activities for as long as eight hours 2 mischief to instrumentation and additionally offices break in tasks for eight 48 hours 3 major damage to the instrumentation or potentially offices break in tasks for every 48 hours all base camp or potentially pc focus capacities ought to be resettled bound suspicions is also important to consistently apply evaluations to every possible danger

Following is run of the mill suspicions which can be utilized all through the peril evaluation measure:

- 1. In spite of the fact that affect evaluations may fluctuate somewhere in the range of one and three for any office given a particular situation, appraisals applied should reflect expected, apparent or anticipated effect on each space.
- 2. each potential danger ought to be thought to be "confined" to the force being appraised.
- 3. Despite the fact that one potential danger could lead on to an uncommon likely danger (e.g., a typhoon may bring forth cyclones), no aftereffect ought to be expected.
- 4. On the off chance that the consequences of the danger wouldn't warrant development to Associate in Nursing substitute site(s), the effect ought to be appraised no over a "2."
- 5. The threat evaluation should be performed by the force. to gauge the likely dangers, a weighted reason rating framework is utilized.

4.8 Functional Requirements

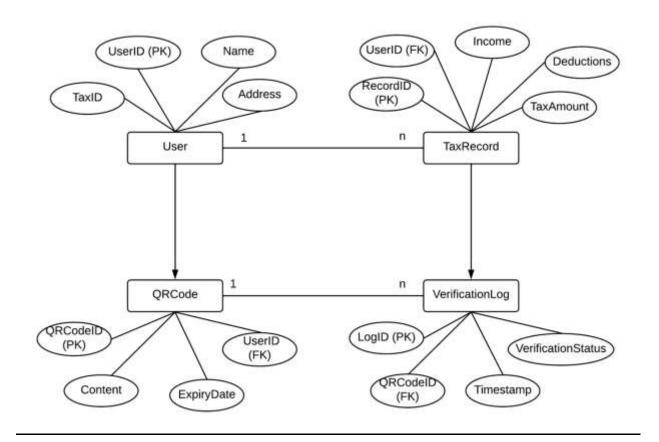
- 1. **User Authentication**: Users should be able to sign up and sign in using unique credentials.
- 2. **Tax Application**: Upon login, users can apply for tax payment by providing necessary details such as income, deductions, etc.
- 3. **Tax Calculation**: The admin module calculates the user's tax liability based on the provided details.
- 4. **QR Code Generation**: After tax calculation, the system generates a QR code containing the user's tax details.
- 5. **Online Payment:** Users can pay their taxes using various online payment methods integrated into the system.

4.9 Non-Functional Requirements

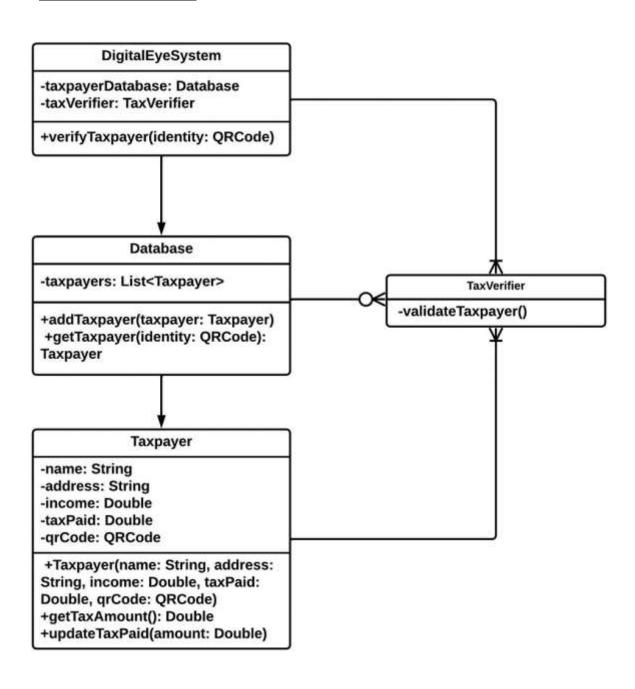
- 1. **Security**: The system should ensure secure authentication, data transmission, and payment processing to protect user information and financial transactions.
- 2. **Scalability**: The system should be able to handle a growing number of users and transactions without compromising performance.
- 3. **Reliability**: The system should be reliable, with minimal downtime and accurate tax calculations.
- 4. **Performance**: The system should have fast response times for generating QR codes, processing payments, and accessing user profiles.
- 5. **Compatibility:** The system should be compatible with different devices and web browsers to accommodate a diverse user base.
- 6. **Integration**: The system should seamlessly integrate with external payment gateways and APIs for online payment processing and notification handling.

5. Design & Implementation

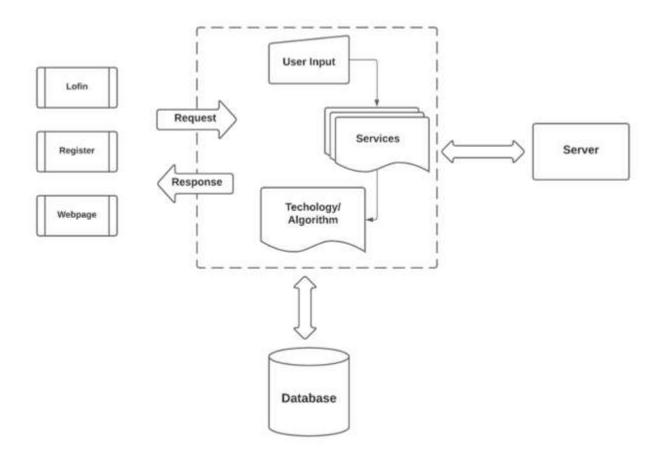
5.1 E-R Diagram



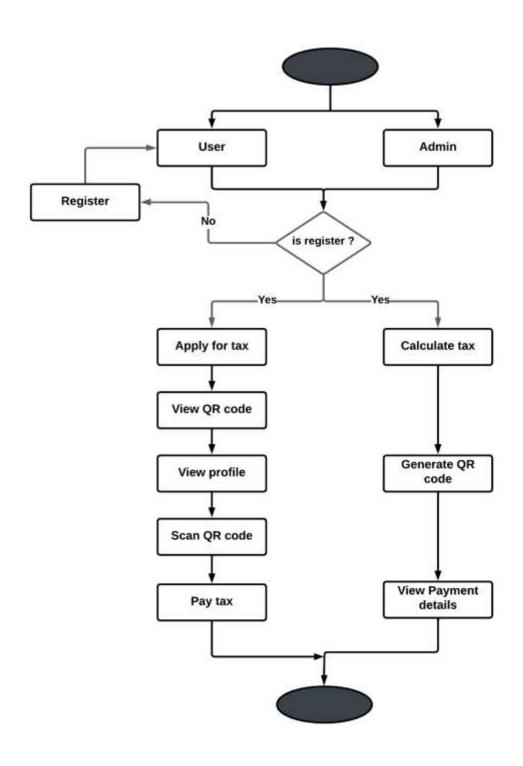
5.2 Class Diagram



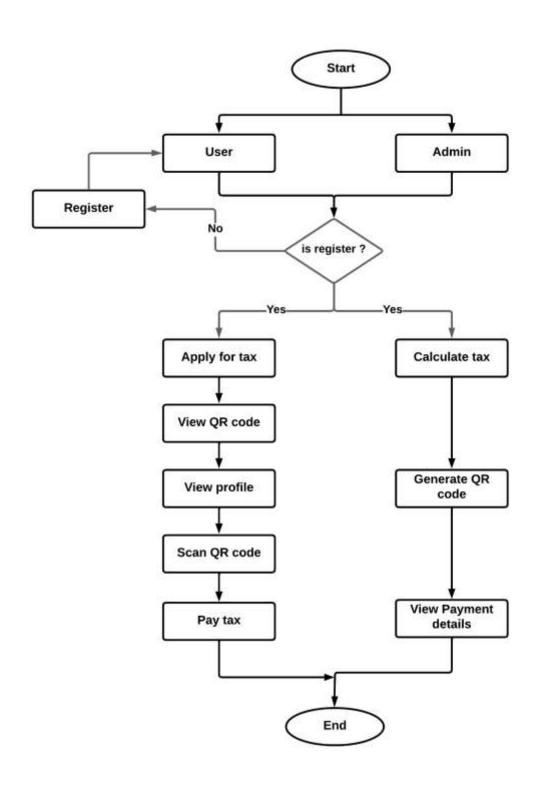
5.3 DFD-0



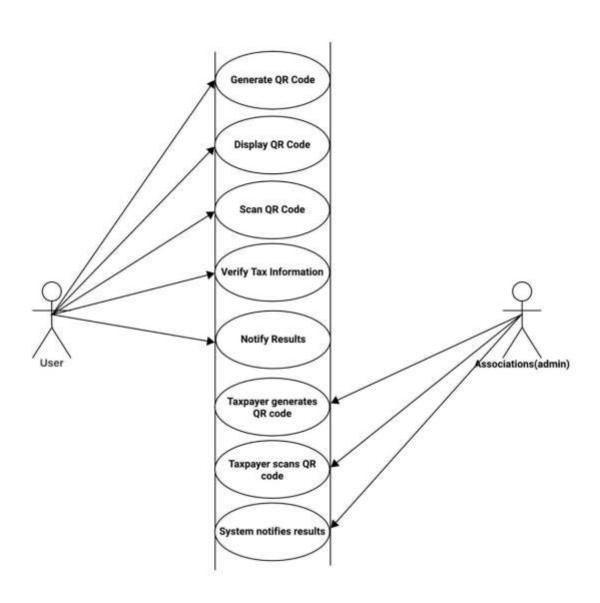
5.4 Activity Diagram



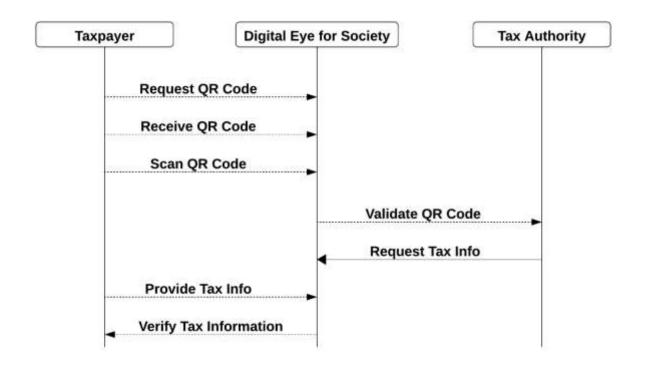
5.5 Flow Diagram



5.6 Use Case Diagram



5.7 Sequence Diagram



6. Future Modifications & Conclusion

Future Modifications

- 1. **Multi-factor Authentication (MFA)**: Implement MFA for user authentication to enhance security, requiring users to verify their identity through multiple methods such as SMS codes, biometric authentication, or authentication apps.
- 2. **Enhanced User Profiles**: Expand user profiles to include additional information such as contact details, tax history, and preferences. Allow users to update their profiles, view past tax payments, and set up notifications for important events like tax deadlines or policy changes.
- 3. **Customisable Tax Calculations**: Provide options for users to input additional information or preferences that may affect their tax calculations, such as deductions, exemptions, or special circumstances. Allow users to preview and adjust their tax liabilities before final submission.
- 4. **Integration with External Systems**: Integrate the system with external services or APIs for additional functionalities such as real-time exchange rate calculations for international transactions, automatic tax filing with government agencies, or integration with accounting software

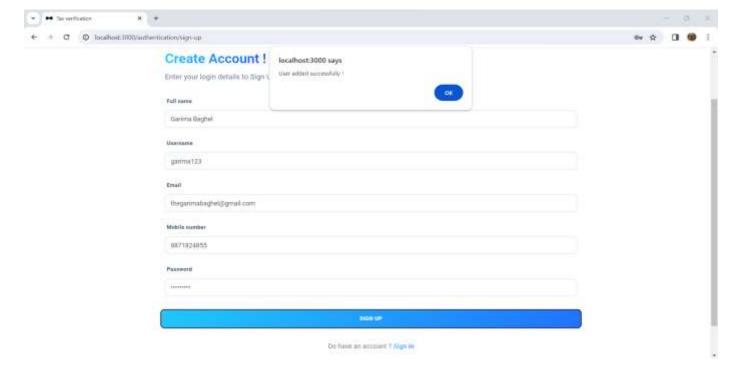
 for business users.
- 5. **Data Encryption and Privacy Measures**: Implement robust data encryption techniques to protect sensitive user information and tax data both in transit and at rest. Ensure compliance with data protection regulations such as GDPR (General Data Protection Regulation) or HIPAA (Health Insurance Portability and Accountability Act), depending on the jurisdiction and user demographics.

Conclusion

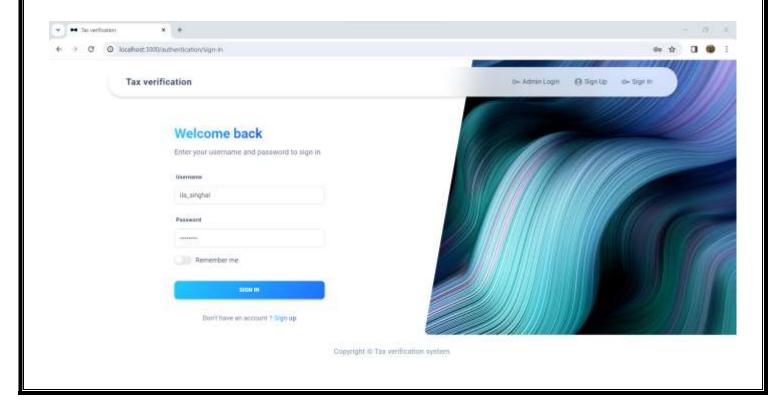
In conclusion, the tax verification system integrating QR code technology, alongside the user and admin modules, presents a comprehensive solution for streamlining tax payment processes. By enabling users to sign in securely with unique credentials and apply for tax payments effortlessly, coupled with the admin's ability to calculate taxes accurately and generate QR codes for easy access to tax details, the system enhances efficiency and convenience. With seamless integration of online payment methods, real-time notifications, and comprehensive transaction tracking, the system ensures transparency and security throughout the tax payment lifecycle. Leveraging the power of React for dynamic user interfaces, Spring Boot for robust backend services, and MySQL for scalable database management, the system offers a modern, scalable, and reliable solution for tax verification, benefiting both users and administrators alike.

7. Screenshots of Project

Sign Up Layout

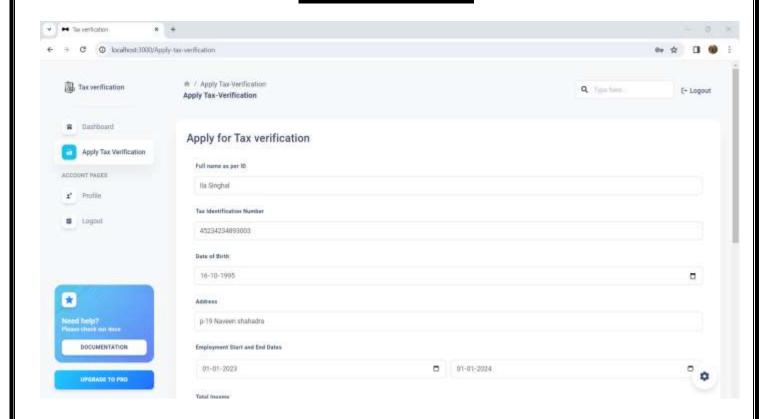


User Login Page

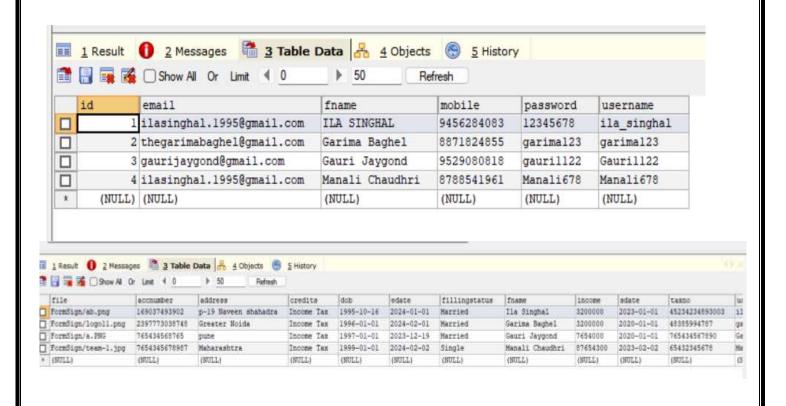


Tax Verification Using QR Code

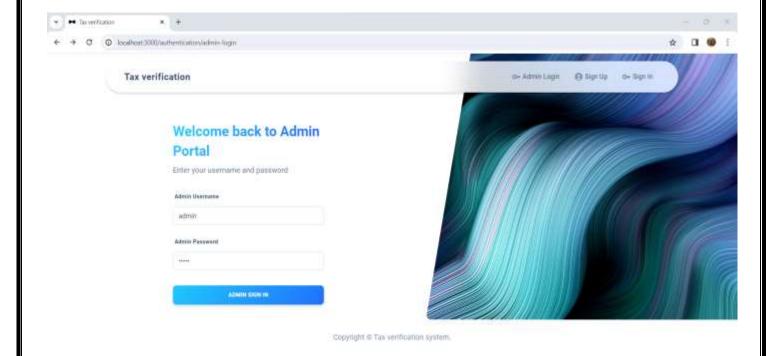
Apply Tax Verification



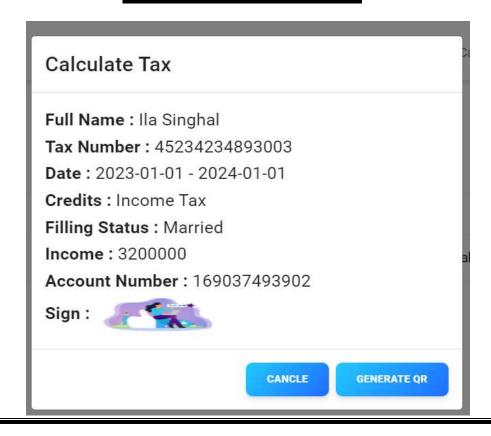
Database



Admin Login Page

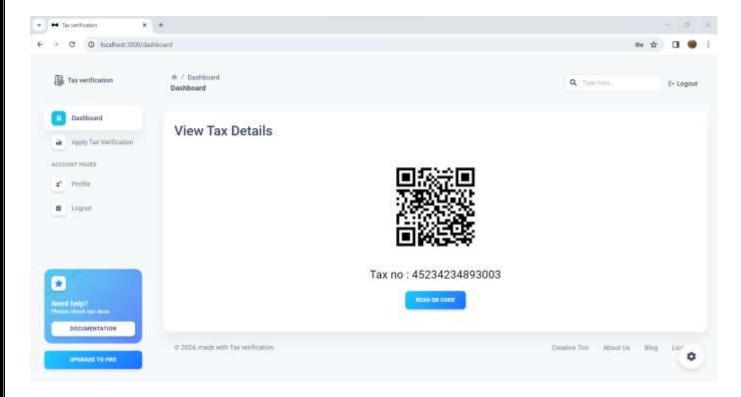


QR Generation/Admin Layout



Tax Verification Using QR Code

Generated QR Code



QR Code Scan Information

