

BLOCKCHAIN BASED COMPLAINT MANAGEMENT SYSTEM

A MINI PROJECT REPORT

Submitted by

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BONAFIDE CERTIFICATE

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INTERNAL EXAMINER

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ABSTRACT

This project aims to provide a secure and transparent complaint registration system using block chain technology. Users can register their complaints and update the complaint status from pending to resolved. The system is built using React.JS & Tailwind CSS, Solidity and Foundry.

Features

Users can register their complaints by providing necessary details such as complaint description, category, and date of occurrence.

Complaint status update: Users can update the status of their complaints from pending to resolved. This feature ensures that users are informed about the progress of their complaints.

Secure: The use of blockchain technology ensures that the data is secure and tamper-proof. Only the complaint registered wallet can change the complaint status, ensuring that the process is secure.

Transparency: Anyone can search for complaints using the wallet address, but personal data is not visible. The searcher can only see the complaint ID, complaint description, complaint registered time, response from the admin, response time, and the complaint status.

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LIST OF ABBREVIATIONS

UI	User Interface
GPS	Global Positioning System
IPFS	InterPlanetary File System

CHAPTER 1

INTRODUCTION

1.1 OBJECTIVE OF THE PROJECT

The primary objective of this project is to develop a complaint registration system that is secure, transparent, and efficient. The system aims to provide users with a seamless experience for registering their complaints by collecting necessary details such as complaint description, category, and date of occurrence. Additionally, users will have the ability to update the status of their complaints from *rhelfpending* to resolved, ensuring they are kept informed about the progress of their issues. To ensure the security and integrity of the data, blockchain technology will be employed. This technology guarantees that the complaint data is tamper-proof and only the complaint registered wallet can modify the complaint status, enhancing the overall security of the system. Transparency is another crucial objective of this project. While personal data will remain protected and inaccessible, anyone can search for complaints using the wallet address. The system will display pertinent information such as the complaint ID, description, registered time, response from the admin, response time, and status. This transparency fosters trust and allows users to track the status of their complaints while safeguarding their privacy. The project also includes the development of an admin panel with wallet-based authentication. This ensures that only authorized individuals can access the admin dashboard, providing an additional layer of security. The admin panel will offer various functionalities, including displaying the total number of registered complaints, highlighting the ID of the most recently responded complaint, allowing administrators to respond to complaints, and providing a list of complaints with updated statuses. In conclusion, the project's objectives encompass the development of a secure, transparent, and efficient complaint registration system. By

leveraging blockchain technology, React.js, TailwindCSS, Solidity, and Foundry Polygon network, the system aims to provide a robust solution for businesses, government agencies, and individuals seeking a reliable platform to handle complaints.

1.2 OVERVIEW OF THE PROJECT

The project aims to create a secure and transparent complaint registration system using blockchain technology. It focuses on providing users with a seamless experience to register their complaints and track their progress.

The system utilizes technologies such as React.js, TailwindCSS, Solidity, and the Foundry Polygon network. Users can easily register their complaints by providing necessary details like description, category, and date of occurrence. Once registered, users can update the status of their complaints from pending to resolved, ensuring they are kept informed about the progress. The use of blockchain technology ensures the security and integrity of the data, making it tamper-proof. Only the complaint registered wallet can modify the complaint status, ensuring a secure process.

Transparency is a key aspect of the system, allowing anyone to search for complaints using the wallet address. However, personal data remains protected, and only specific complaint details are visible, such as the ID, description, registered time, admin response, response time, and status. This transparency enables users to track their complaints while maintaining privacy. The project also includes an admin panel with wallet-based authentication, ensuring authorized access. The admin dashboard provides functionalities such as displaying the total number of complaints, highlighting the last responded complaint ID, enabling admins to respond to complaints, and presenting a list of complaints with updated statuses. Overall, the project

aims to deliver a secure, transparent, and efficient complaint registration system that benefits businesses, government agencies, and individuals. By leveraging blockchain technology and modern web development tools, it provides a reliable platform to handle complaints and streamline the resolution process.

1.3 OVERVIEW OF THE DOMAIN

Blockchain technology has emerged as a transformative force in various domains, revolutionizing the way we store, manage, and exchange digital information. At its core, a blockchain is a decentralized and distributed ledger that maintains a secure and immutable record of transactions or data across multiple participants or nodes. It eliminates the need for intermediaries, such as banks or third-party authorities, by relying on cryptographic algorithms and consensus mechanisms.

In the domain of blockchain, transparency and security are key features. The decentralized nature of the technology ensures that no single entity has complete control over the data, making it resistant to manipulation or fraud. Each transaction or data entry is cryptographically linked to the previous one, forming a chain of blocks that is highly secure and tamper-proof. This immutability and transparency foster trust and enable transparent verification of transactions or information.

Blockchain technology also introduces smart contracts, which are self-executing contracts with predefined rules and conditions. These contracts are automatically enforced by the blockchain, eliminating the need for intermediaries and reducing the possibility of disputes or breaches. Smart contracts have the potential to streamline and automate complex business processes, enhancing efficiency and reducing costs.

The domain of blockchain has found applications beyond cryptocurrencies, such as in supply chain management, healthcare, finance, voting systems, intellectual property, and more. Its decentralized and transparent nature provides benefits like increased efficiency, enhanced security, reduced costs, improved traceability, and greater accountability. However, challenges remain, including scalability, interoperability, regulatory frameworks, and energy consumption.

As blockchain technology continues to evolve, ongoing research and development are focused on addressing these challenges and exploring new use cases. The potential for blockchain to disrupt traditional industries and transform various sectors is vast, making it an exciting and promising domain with significant implications for the future of digital transactions and data management.

1.4 PROBLEM STATEMENT

In many organizations and systems, the process of handling complaints is often inefficient, opaque, and prone to security risks. Traditional complaint registration systems lack transparency, making it challenging for users to track the status and progress of their complaints. Moreover, centralized databases are vulnerable to data breaches and tampering, undermining the trust and security of the complaint management process. Additionally, there is a lack of standardized and secure platforms that allow for seamless communication and updates between users and administrators.

These challenges call for a solution that provides a secure and transparent complaint registration system. The system should ensure that users can easily register their complaints, receive updates on their progress, and have confidence in the security and integrity of their data. It should also offer a reliable platform for administrators to efficiently handle and respond to complaints while maintaining privacy and accountability.

Therefore, there is a need for a robust complaint registration system that leverages blockchain technology to address these pain points. This system should provide secure and tamper-proof storage of complaint data, offer transparency to users while protecting their personal information, enable seamless communication between users and administrators, and enhance overall efficiency in handling and resolving complaints. By addressing these challenges, the project aims to provide an effective solution for organizations, government agencies, and individuals seeking a secure and transparent complaint registration system.

CHAPTER 2

LITERATURE SURVEY

2.1. SECURE COMPLAINT MANAGEMENT SYSTEM AGAINST WOMEN HARASMENT AT WORKSPACE USING BLOCKCHAIN TECHNOLOGY

Authors: Md.Mijanur Rahman,Md.Moshiul Azam,Faria Sajida Chowdhury

Year:2022

Description

Since the Industrial era, women are playing a significant role in the workforce to move the world forward. Their increasing contribution in various fields has earned a fortune for the global economy. Despite that, women constantly face more obstacles than men in the workplace. When half of the population are mistreated because of gender inequality, the economy of any nation is supposed to collapse. One of the biggest barriers for women in their careers is workplace harassment. Workplace harassment may include physical, verbal or nonverbal harassment that not only have an adverse effect on a woman's career, mental health and physical health but also organizational reputation. A common way to make a complaint in most organizations is to fill up a complaint form, email or go directly to the competent authority and complain. But victims often hesitate to complain because their identity might get revealed or their documentary evidence might be tampered. As a result, most of the harassers get through very easily. To resolve this problem, this paper presents a blockchain-based anonymous, transparent and secure platform where women can easily complain against their harassers. To keep the platform secure and reliable, a two-level hierarchical model is introduced, where level-1 is the Human Resources (HR) and level-2 is the Higher

Authority. In level-1, victims can anonymously complain to HR and in Level-2, victims can complain with their identity revealed to higher authority. This way, the proposed platform ensures women of a healthy work environment and provides all necessary support to stand up against injustice in the workplace.

2.2 POLICE COMPLAINT MANAGEMENT SYSTEM USING BLOCKCHAIN TECHNOLOGY

Authors: Ishwarlal Hingorani; Rushabh Khara; Deepika Pomendkar; Nataasha Raul

Year:2020

Description

The criminal activities in India are increasing at a rapid rate. Many of these activities go unreported. Even after having an online portal for the police for storing FIRs and NCRs, most of the FIRs are handwritten as a traditional practice. In most of the cases, the complainant has to be present in the police station to file a cognizable offense. An effective system for e-governance was started in 2009 named Crime and Criminal Tracking Network and Systems (CCTNS) for the entire country. However, it is a centralized system for a particular state. Thus there is a need for a completely decentralized system for assuring that there is no central point of failure in the system and complaints are managed securely protected from unauthorized access. Our aim is to propose a blockchain-based solution to manage complaints against both cognizable and non-cognizable offenses. The FIR filed by the police will be encrypted, stored in the IPFS and hash is added to the blockchain network. If the police decide not to file the FIR under pressure or deny receiving any complaint, then the complainant will have strong proof against him/her as the complaint along with its timestamp was stored on the blockchain network.

Having all the records stored in an immutable database would remove any chances of the FIR/NCR being tampered and going unnoticed.

2.3. BLOCKCHAIN IMPLICATIONS IN THE MANAGEMENT OF PATIENT COMPLAINTS IN HEALTHCARE

Authors: Yazan M. Alkhateeb

Year:2021

Description

Blockchain is an emerging technology that has recently been the focus for many researchers who have highlighted its diverse applications including healthcare. Transparency in managing unsolicited patient complaints is important in healthcare for both patients and healthcare providers; in addition, patient complaints analysis is significant to the continued quality improvement. Accordingly, the purpose of this study is to understand the nature of patient complaints management in the healthcare settings, explore the implications of blockchain on the management of patient complaints, and identify limitations in the usage of blockchain. Structured qualitative review and content analysis of the literature methods were used through multiple inclusion and exclusion phases for the scope of this research. Blockchain technology characteristics have been analyzed and approximated with desired features in the patients' complaint management. Patient complaints provide valuable information to drive continuous improvements in healthcare. Blockchain is described as transparent, decentralized, immutable and anonymous. Results of this research found that a complaint Management system that is built on blockchain technology might have desired features that involve data integrity, security and transparency. Blockchain does have certain limitations that involve cybersecurity, scalability, confidentiality, readiness to adopt it, and is uncertainty about its impact. As a conclusion,

implementing a system to manage patient complaints that is based on blockchain technology is promising, due to its desired possible features..

2.4. CUSTOMER COMPLAINT MANAGEMENT AND SMART TECHNOLOGY ADOPTION BY COMMUNITY WATER SYSTEMS

Authors: Morgan DiCarlo, Nikhil Kaza, Luke Shealy

Year:2021

Description

Community water systems supply safe drinking water through pipes and other conveyances to the same population year-round. Complaint management is an important activity for CWSs and can assist efforts to monitor water quality and improve public perceptions. This research explores how CWSs receive, store, and use customer complaints. A new dataset is constructed through the distribution of an online survey. Respondents represent more than 500 CWSs across the U.S. and vary in characteristics, including the population size served. This research gives new insight about the tools that CWSs need and are willing to adopt for analyzing and reporting water quality issues.

2.5. GPS BASED COMPLAINT REDRESSAL SYSTEM

Authors: Vinesh K Kandhari , Keertika D Mohini

Year:2014

Description

Citizens of any country face civic problems in their day to day lives. They resort to the one of the several ways provided by the government to file their complaints. With advancements in technology, the complaint registration systems have evolved in different ways to simplify the task of registering as

well as addressing the complaints. This research paper presents the architecture of a GPS based Complaint Redressal System (GPSCRS). The complaint is registered via a mobile application. Global Positioning System sensor present in smart mobile devices is used to determine the exact location of the complaint. The area of the complaint is automatically detected, and the complaint information is sent over the internet to a central server. The complaints are then plotted on a map in the web interface.

CHAPTER 3

METHODOLOGY

3.1 METHODS

3.1.1. REQUIREMENT GATHERING

Begin by understanding the specific requirements and objectives of the complaint registration system. This involves gathering inputs from stakeholders, including users, administrators, and any relevant regulatory or legal requirements.

3.1.2. SYSTEM DESIGN

Develop a comprehensive system design that encompasses the user interface, database structure, smart contract design (if applicable), and integration of the necessary technologies such as React.js, TailwindCSS, Solidity, and the Foundry Polygon network. Consider factors such as scalability, security, and user experience during the design phase.

3.1.3. AGILE DEVELOPMENT

Adopt an agile development methodology to iteratively build and refine the system. Break the project into smaller tasks and sprints, allowing for regular feedback and adjustments. This approach enables flexibility, promotes collaboration, and ensures that the system meets evolving needs.

3.1.4. BLOCKCHAIN INTEGRATION

Implement the blockchain components of the system using Solidity, a programming language for smart contracts. Create smart contracts for complaint registration, status updates, and other relevant functionalities. Integrate the system with the chosen blockchain network (such as the Polygon network) to ensure secure and decentralized storage of complaint data..

3.2 MODULES

- Complaint Registration
- Complaint Management
- Complaint Status Updates
- Search and View Complaints
- Admin Panel

3.2.1 COMPLAINT REGISTRATION

This module enables users to register their complaints by filling out a form or using an intuitive interface. Users provide relevant details, including a comprehensive description of the complaint, the category it belongs to, and the date of occurrence. Complaint validation is performed to ensure that all necessary fields are filled and the complaint meets specific criteria. Once the complaint is successfully registered, it is assigned a unique identifier or complaint ID for easy tracking and reference.

3.2.2 COMPLAINT MANAGEMENT

The Complaint Management module handles the storage, organization, and retrieval of registered complaints. Complaints are stored in a database or decentralized storage system for efficient management and retrieval. The module includes functionalities to create new complaint records, update existing complaints, retrieve complaint details, and delete complaints if necessary. Each complaint record contains essential information, such as the user's details, complaint description, registration time, and the current status of the complaint (e.g., pending, in progress, resolved).

3.2.3 COMPLAINT STATUS UPDATE

This module enables users to update the status of their complaints based on their progress and resolution. Users can change the status of their complaints from pending to resolved or provide additional updates if needed. The system sends notifications or updates to users, keeping them informed about any changes or actions taken regarding their complaints. Timely status updates improve transparency and provide users with a clear understanding of the progress made in addressing their complaints.

3.2.4 SEARCH AND VIEW COMPLAINTS

The Search and View Complaints module allows users and administrators to search for complaints using various filters and criteria. Users can search for complaints based on complaint ID, category, date of occurrence, or any other relevant parameters. The module presents a list of complaint records matching the search criteria, displaying essential details such as the complaint ID, description, registration time, admin responses, response time, and current complaint status. Personal information of users is not visible in the search results, ensuring privacy while still providing necessary information for reference and tracking purposes.

3.2.5 ADMIN PANEL

The Admin Panel module provides a dedicated dashboard and functionalities for authorized administrators to manage complaints effectively. Authentication mechanisms ensure that only authorized administrators can access the admin dashboard. The dashboard includes tabs or sections that display important information for administrators to monitor and handle complaints efficiently. These sections may include the total count of registered complaints, the identifier of the last complaint responded to by the admin, and a list of complaints with updated statuses. Administrators can

respond to complaints, update their status, and communicate with users through the admin panel, facilitating effective complaint resolution.

3.3 EXISTING SYSTEM

The existing system for complaint registration and management often relies on manual processes. Users submit their complaints through various channels such as paper forms, emails, or phone calls. Administrative staff manually record and store the complaints in physical files or documents, documenting relevant information such as the complaint description and user details. Tracking and processing of complaints are also done manually, involving the assignment of complaint IDs, status updates, and routing to the relevant departments or personnel for resolution. Communication and updates regarding the progress of complaints are typically carried out through traditional means, such as phone calls, emails, or in-person interactions. This manual system can be prone to errors, delays, and lack of transparency, making it challenging to efficiently handle and address complaints.

3.3.1 DISADVANTAGES

- Manual Data Entry and Storage.
- Lack of Efficiency.
- Limited Accessibility
- Lack of Transparency
- Data Security and Privacy Risks
- Difficulty in Reporting and Analytics
- Inefficient Resource Allocation
- Limited Scalability

3.4 PROPOSED SYSTEM

The proposed complaint registration system aims to address the limitations of the existing manual system by leveraging blockchain

technology and modern web development tools. By utilizing blockchain, the system ensures secure and tamper-proof storage of complaint data, enhancing data integrity and privacy. The use of smart contracts enables automated processes, streamlining complaint registration, status updates, and resolution. With a user-friendly front-end interface built with React.js and TailwindCSS, users can easily register complaints, track their progress, and receive timely updates.

The admin panel provides authorized administrators with a comprehensive dashboard for efficient complaint management, including features like complaint statistics and response tracking. The proposed system enhances transparency by allowing users and administrators to search and view complaints without revealing personal information. With automation, security, transparency, and efficient complaint handling at its core, the proposed system aims to provide an improved user experience, effective complaint resolution, and enhanced accountability for businesses, government agencies, and individuals alike.

3.4.1 ADVANTAGES

- Enhanced Efficiency.
- Improved Transparency
- Secure and Tamper-Proof data
- User-friendly Interface
- Efficient Complaint Management
- Privacy Protection
- Scalability and Flexibility

CHAPTER 4

SYSTEM IMPLEMENTATION

The implementation of the proposed complaint registration system involves a combination of technologies and methodologies to ensure its successful deployment. The system is built using React.js and TailwindCSS for the front-end interface, providing a responsive and user-friendly experience. Solidity, a programming language for smart contracts, is utilized for the implementation of blockchain functionalities. The system is integrated with the Polygon network, a scalable blockchain solution, to leverage its benefits in terms of security and transaction speed.

The implementation process begins with requirement gathering and analysis, where the specific needs and functionalities of the system are defined. This is followed by system design, including the architecture, database schema, and user interface design. The development phase involves coding the different modules, including user registration, complaint registration, complaint management, status updates, search functionality, and the admin panel.

Testing plays a crucial role in ensuring the system's quality and reliability. Various testing methodologies, such as unit testing, integration testing, and user acceptance testing, are employed to identify and rectify any issues or bugs. Once the system passes the testing phase, it moves to the deployment stage.

During deployment, the system is hosted on a suitable infrastructure, which could be cloud-based servers or on-premises servers, depending on the organization's requirements and preferences. Proper configuration and setup are performed to ensure the system's stability and availability.

Post-deployment, continuous monitoring and maintenance of the system are carried out to ensure smooth operation and address any potential issues that may arise. Regular updates and enhancements can be implemented based on user feedback and evolving requirements.

Overall, the implementation of the proposed complaint registration system involves a systematic approach, encompassing requirement analysis, design, development, testing, deployment, and ongoing maintenance. By following a structured implementation methodology, the system can be effectively deployed, providing the intended benefits of secure and transparent complaint registration and management.

The implementation of the proposed complaint registration system involves a comprehensive and systematic approach. It begins with integrating blockchain technology using Solidity and the Foundry Polygon network. Smart contracts are developed to facilitate secure and tamper-proof storage of complaint data. The system's user interface is implemented with a responsive design, ensuring seamless access and interaction across various devices. Security measures, such as data encryption and authentication mechanisms, are implemented to safeguard user information and prevent unauthorized access. Scalability considerations are taken into account, optimizing database design and utilizing scalable hosting solutions to accommodate a growing volume of complaints. Rigorous testing methodologies are employed to ensure the system's quality and reliability, including unit testing, integration testing, and user acceptance testing.

Documentation and training materials are prepared to guide system administrators and users. Continuous improvement is emphasized, allowing for updates, bug fixes, and feature enhancements based on feedback and changing requirements. With this holistic implementation approach, the proposed system can provide a secure, transparent, and efficient complaint registration and management solution.

4.1 CONTRACT TESTING

Contract testing is an essential part of the implementation process for the proposed complaint registration system built on the Foundry Polygon network. Contract testing involves verifying the functionality and integrity of smart contracts deployed on the blockchain. Foundry provides a robust environment for conducting contract testing, offering a secure and scalable platform.

During contract testing, various scenarios and use cases are simulated to ensure that the smart contracts behave as expected. This includes testing different complaint registration and status update scenarios, verifying that the contracts accurately capture and store the complaint data, and confirming that only authorized wallet addresses can modify the complaint status.

The contract testing process involves deploying the smart contracts on the Polygon network and executing a series of predefined tests. These tests validate the contract's behavior, including its ability to handle complaint registration, retrieve complaint details, update complaint status, and maintain data integrity. Test cases are designed to cover different functionalities and edge cases to ensure comprehensive coverage.

The results of contract testing are thoroughly analyzed to identify any issues or inconsistencies. Any bugs or vulnerabilities found during testing are addressed and resolved before the system is deployed to production. By conducting comprehensive contract testing using Foundry Polygon, the proposed complaint registration system can ensure the reliability and correctness of its smart contracts, enhancing the overall security and functionality of the system.

CHAPTER 5

SOFTWARE DESCRIPTION

The complaint registration system is developed using a combination of Solidity, React.js, and TailwindCSS, leveraging the strengths of each technology to create a robust and user-friendly software application.

Solidity is a programming language specifically designed for developing smart contracts on blockchain platforms. In the context of this project, Solidity is used to write the smart contracts that handle the registration, storage, and management of complaints on the blockchain. Solidity provides the necessary functionalities to define the data structure, implement business logic, and ensure the security and integrity of the complaint data.

React.js is a popular JavaScript library for building user interfaces. It allows for the development of dynamic and responsive front-end applications. In this project, React.js is utilized to create the user interface for the complaint registration system. It enables the development of a user-friendly and interactive interface that allows users to easily register complaints, view their status, and receive updates. React.js also facilitates seamless data communication between the front-end and the blockchain back-end.

TailwindCSS is a utility-first CSS framework that provides a set of pre-defined classes for rapid UI development. It simplifies the styling and layout process by offering a wide range of ready-to-use CSS classes. In the context of this project, TailwindCSS is utilized to design and style the user interface components of the complaint registration system. It allows for the creation of a visually appealing and consistent UI design by applying TailwindCSS classes directly in the React.js components.

By combining Solidity, React.js, and TailwindCSS, the complaint registration system benefits from the security and transparency of blockchain technology, the dynamic and responsive user interface provided by React.js, and the ease of styling and layout design offered by TailwindCSS. This combination ensures that the system is not only secure and efficient but also provides an intuitive and visually appealing user experience.

CHAPTER 6

CONCLUSION & FUTURE WORK

6.1 CONCLUSION

Solidity, React.js, and TailwindCSS offers a secure, transparent, and efficient solution for handling complaints. The system provides several advantages over the existing manual processes, including enhanced efficiency, improved transparency, secure and tamper-proof data storage, user-friendly interface, privacy protection, and scalability. By leveraging blockchain technology, the system ensures the security and integrity of complaint data, providing a tamper-proof and decentralized storage solution. The use of Solidity enables the implementation of smart contracts that automate and streamline the complaint registration and management processes.

React.js and TailwindCSS contribute to an intuitive and visually appealing user interface, enhancing the user experience and facilitating seamless interaction with the system. The admin panel provides administrators with a comprehensive dashboard for efficient complaint management, allowing them to track and respond to registered complaints effectively. The system's search functionality enables users to easily access and monitor the progress of their complaints, while maintaining their privacy. Overall, the proposed system addresses the limitations of the existing manual systems by leveraging cutting-edge technologies. It offers a secure, transparent, and user-friendly platform for complaint registration and management, benefiting businesses, government agencies, and individuals seeking an efficient and reliable complaint handling process.

6.2 FUTURE WORK

In terms of future work, there are several areas where the proposed complaint registration system can be further developed and expanded. Firstly,

one potential avenue is to enhance the reporting and analytics capabilities of the system. This would involve implementing advanced data visualization techniques and incorporating more comprehensive reporting functionalities. By analyzing complaint data, organizations can gain valuable insights into trends, patterns, and areas for improvement, leading to better decision-making and more efficient complaint resolution processes. Secondly, the system can be extended to integrate with external systems and platforms. For example, integration with customer relationship management (CRM) systems or ticketing systems can streamline the complaint management process by enabling seamless data synchronization, automated notifications, and improved collaboration between different departments or stakeholders. This integration would further enhance the efficiency and effectiveness of the complaint resolution process.

APPENDICES

APPENDIX 1

Contract.sol

```
// SPDX-License-Identifier: MIT
```

```
pragma solidity 0.8.19;
```

```
contract Complaint {
```

```
    address public owner;
```

```
    uint256 internal count; // Total number of complaints
```

```
    uint256 internal lastRespondedComplaint; // @admin responded complaint id
```

```
    uint256 internal respondedComplaints; // Total @admin responded complaints  
    count
```

```
    uint256 internal totalStatusUpdates; // @user total status update complaints
```

```
    constructor() {
```

```
        owner = msg.sender;
```

```
        count = 1; // initial value for the complaints count
```

```
    }
```

```
    // modifier
```

```
    modifier OnlyOwner() {
```

```
        require(msg.sender == owner, "Not the owner");
```

```
        _;
```

```
    }
```

```
    // events
```

```
    event ComplaintRegistered(address, string);
```

```
    event ComplaintUpdated(address);
```



```
event ReponseAdded(address, uint256);
```

```
// function for the user => Register complaint => Search complaint => Update
```

```
Status
```

```
struct complaint {
```

```
uint256 id;
```

```
string name;
```

```
string email;
```

```
string addr;
```

```
uint256 mobile;
```

```
address wallet;
```

```
string description;
```

```
uint256 time;
```

```
string repsonse;
```

```
uint256 repsonse_time;
```

```
bool status;
```

```
}
```

```
mapping(address => complaint) internal userComplaint;
```

```
mapping(uint256 => complaint) internal adminComplaint;
```

```
// Register a complaint
```

```
function Register(
```

```
string calldata _name,
```

```
string calldata _email,
```

```
string calldata _addr,
```

```
uint256 _mobile,
```

```
string calldata _description
```

```
) public {
```

```

userComplaint[msg.sender] =
complaint(count, _name, _email, _addr, _mobile, msg.sender, _description,
block.timestamp, "", 0, false);
// upload data for admin
adminComplaint[count] =
complaint(count, _name, _email, _addr, _mobile, msg.sender, _description,
block.timestamp, "", 0, false);
count = count + 1;
emit ComplaintRegistered(msg.sender, "Complaint Registerd");
}
// Search complaint by address

function Search(address _address) public view returns (complaint memory) {
return (userComplaint[_address]);
}
// Change complaint status

function UpdateStatus() public {
if (userComplaint[msg.sender].status == false) {
++totalStatusUpdates;
}
userComplaint[msg.sender].status = !userComplaint[msg.sender].status;
uint256 ComplaintId = userComplaint[msg.sender].id;
adminComplaint[ComplaintId].status = !adminComplaint[ComplaintId].status;
emit ComplaintUpdated(msg.sender);
}

// <----- Admin function ----->
// get total compliants

```

```

function TotalCompalints() public view returns (uint256) {
return (count - 1);
}
// number of Responded complaints

```

```

function TotalRespondedComplaints() public view returns (uint256) {
return (respondedComplaints);
}
// get the complaint for admin

```

```

function getComplaint(uint256 _count) public view returns (complaint
memory) {
return (adminComplaint[_count]);
}
// Respond to complaint

```

```

function Respond(uint256 _count, string calldata _response) public
OnlyOwner {
require(_count >= 1 && _count <= count - 1, "Invalid Count");
// update the admin mapping
adminComplaint[_count].repsonse = _response;
adminComplaint[_count].repsonse_time = block.timestamp;
lastRespondedComplaint = _count;
// update the user mapping
address userAddress = adminComplaint[_count].wallet;
userComplaint[userAddress].repsonse = _response;
userComplaint[userAddress].repsonse_time = block.timestamp;
++respondedComplaints;
emit ReponseAdded(userAddress, _count);

```

```
}
```

```
function LastRespondedComplaint() public view returns (uint256) {  
    return (lastRespondedComplaint);  
}
```

```
function TotalStatusUpdate() public view returns (uint256) {  
    return (totalStatusUpdates);  
}
```

```
function TransferOwner(address _newOwner) external OnlyOwner {  
    require(_newOwner != address(0), "Invalid address");  
    owner = _newOwner;  
}  
}
```

APPENDIX 2

SCREENSHOTS

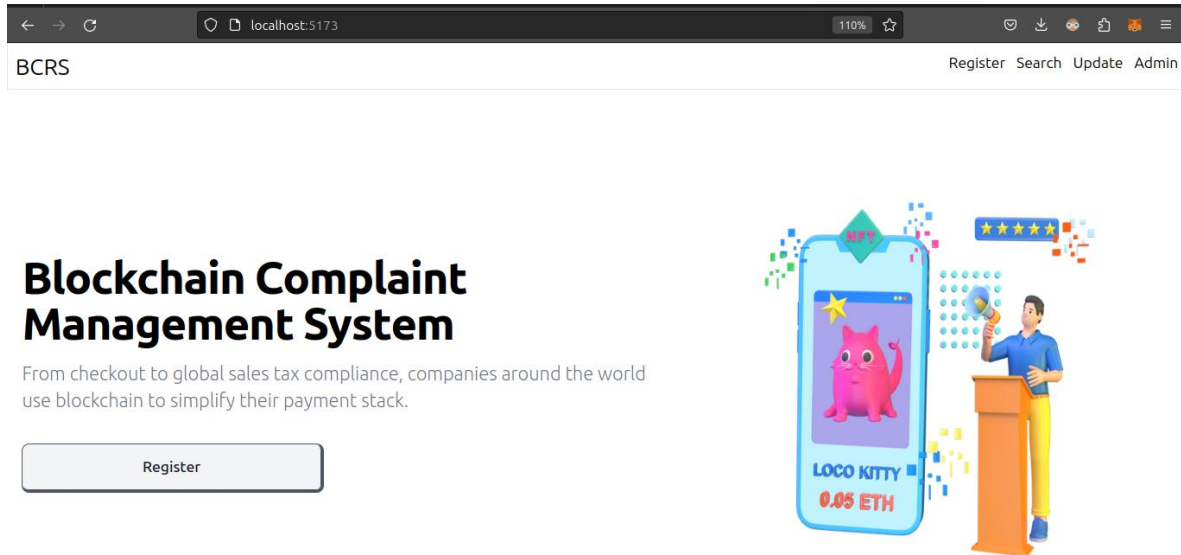


Fig 7.1: Home page

The screenshot shows a web browser at localhost:5173/register displaying the 'Register Complaint' page. The page has a dark header with the title 'Register Complaint' in the center. Below the header are several input fields: 'Name' and 'Email' (side-by-side), 'Address' (a single wide field), 'Mobile No' (a single wide field), and 'Complaint' (a large text area). At the bottom of the form is a dark button labeled 'Connect Wallet' with a dropdown arrow.

Fig 7.2: Complaint Register Page



Fig 7.3: Search complaint by using complainer address

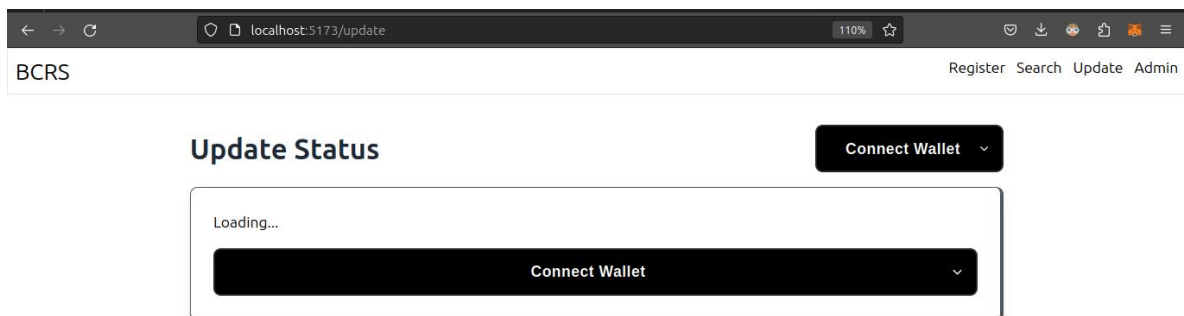


Fig 7.4: User Complaint status update

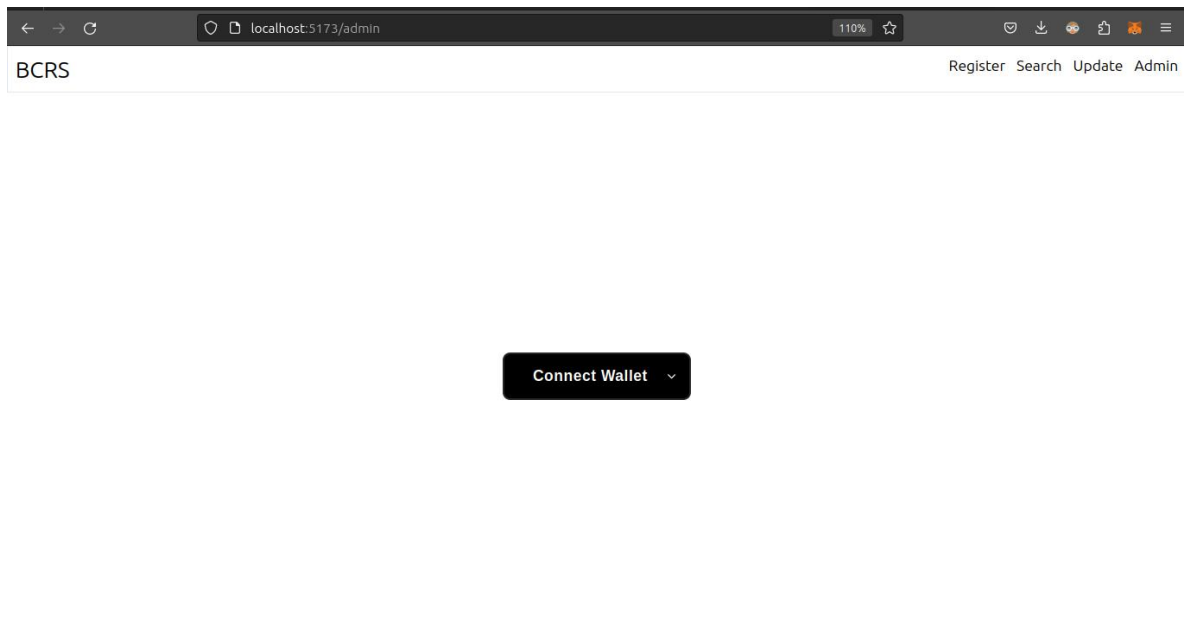


Fig 7.5: Admin login

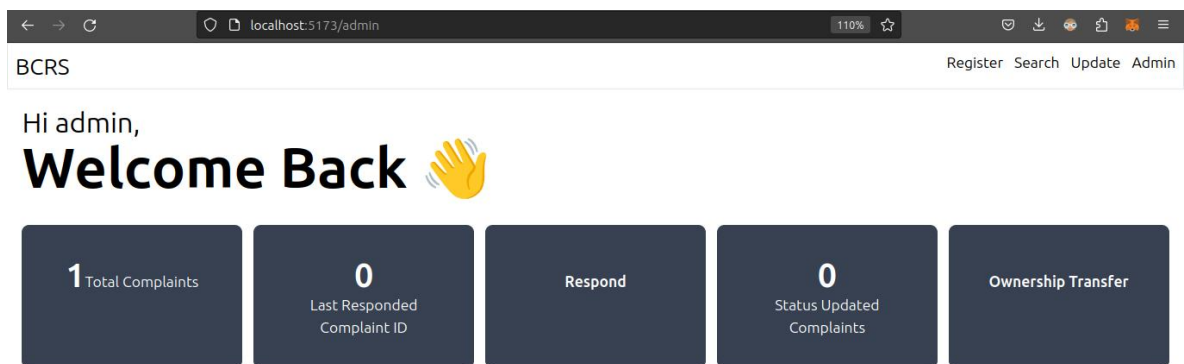


Fig 7.6: Admin dashboard

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