BLOCK CHAIN BASED PUBLIC DOCUMENTS RECORD SYSTEM

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This Report Presented in Partial Fulfillment of the Requirements for the Degree of Bachelor of Science Computer Science and Engineering.

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APPROVAL

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DECLARATION

We hereby declare that this project has been done by us under the supervision of **Tania Khatun, Assistant Professor, Department of CSE and Co-supervision of Mushfiqur Rahman,** Daffodil International University. We also declare that neither this project nor any part of this project has been submitted elsewhere for award of any degree of diploma.

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We would like to express our sincerest gratitude to Dr. S M Aminul Haque, Associate Professor and Associate Head, Department of CSE, for his kind help to finish our project and also to other faculty members and the staff of CSE department of Daffodil International University.

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ABSTRACT

Public document management systems offer unified incorporation with the website. It allows someone to attach documents in the system, directly in an organized way from the website. Public credentials can be easily stockpiled and shared from the website with the help of a public document posting based management system. Public document record systems help to save a lot of expenses that were not thinkable while using the traditional paper filing schemes. It is like a direct saving where someone has to use less paper besides boost extra space. Apart from that, the aspect of file security is another important feature of online document posting based management systems. These files contain important data, personal pictures/journals, passwords and other important digital files and hereafter many companies currently are using this type of document management system. It offers backup files, which is particularly useful for companies that handle a lot of paperwork. It also upholds the documents according to hierarchy of the organization and offers privileges by designations to access the documents. However, the idea of online document posting based management system is not that new, the usage has started gaining momentum in current past and it will assuredly raise more in future. These systems distribute information via the web which gives 24/7 access to information from any distant place. In our developed Block Chain Based public document record system all the above-mentioned issues have been considered and incorporated in a user-friendly manner. Users can easily upload, share, edit documents in a highly secured manner from this system. This system has a free trial version along with a payment-based version for all users. This system has been designed considering all types of professionals and students with minimum hassle. Any abnormal activities or security threats will be monitored by the admin panel.

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CHAPTER 1
INTRODUCTION

1.1 Introduction

With the continuing progression of Digitization, society wish to diminish their paper-based work and wish to have access to their vital documents from everyplace and at any time. Management Systems of public documents are the best resolution to make this task a considerably easier one [1], [2], [3]. Management and storage of data make it relaxed to find it when somebody wants it. There are numerous choices to choose from – offsite and onsite storage of records, storage of tape, and storage of online document. The process of creating a legal agreement or document can be done online without the need for paperwork anymore. It also helps people to store the documents secured online. They can be able to record documents without stand by lines & Can be able to get documents from anywhere. Also, we can put our existing documents on a platform to share it publicly. So, this application brings a new trend of handling things more easily by saving valuable time and extra money.

1.2 Motivation

Creating a legal agreement or document can be hard sometimes. There are multiple processes that need to be followed. Also, there might be a need for stamp paper or any specific paper where the agreement could be written. This document could be something that needs to be done from a remote location or urgently. With our system we can solve most of the problems.

1.3 Objective

1. Minimize the process of legal document creation.
2. Accessible from anywhere anytime.
3. Shareable documents through the platform
4. Ensure security and safety of documents

1.4 Expected Outcome:

1. Web-based Public Document Recording System
2. Secured database of online documents
3. Way forward to further improvement in the scheme of document storage

1.5 Project Management and Finance:

In the developed PDRS scheme will have a robust admin panel during operational stage. Since it has potential demand at present and upcoming future, business, services and security will be strictly and efficiently managed. Low associated maintenance cost and high return value through subscription and other promotional adds will make this tool financially sustainable for developers and users.

1.6 Report Layout:

This development work has been carried out sequentially over six chapters as specified underneath.

Chapter 1 consists of the outline, incentive, purposes and probable outcome of the study.

Chapter 2 deals with the reviews of literature connected to the objectives and results of this study. Conclusions of the previous study works linked to this study have also been concise in this chapter.

Chapter 3 consists of the corporate process of modelling, prerequisite assembly and investigation, use case modelling and explanation, logical data model and design condition of the study.

Chapter 4 consists of the back and front end and interaction strategy, user involvement and application requirements of the study.

Chapter 5 illustrates the execution of database, back end and front-end design, testing operation and testing results of the scheme.

Chapter 6 discusses the argument and supposition, opportunity for further progress of the study.

CHAPTER 2
BACKGROUND

2.1 Preliminaries

The web-based public document record system has been designed for ensuring hassle free and secured platforms for all types of professionals. Nowadays, storing large amounts of data and making it available at anytime and anywhere are very much necessary especially in the pandemic or similar situation when online offices and meetings are occurring frequently [4], [5]. Considering present demand and future potential in this sector we have developed a Block Chain Based Public Document Record System for all users.

2.2 Related Work

Sometimes it's harder to discover the correct document than it is to trek 100 kilometers in bare feet. The ideal solution to all of these issues is web-based document management software [6]. Below is an evaluation and summary of some of the greatest web-based public document storage systems.

2.2.1. GilbyIM

A cloud-based EDRMS named GilbyIM was formed with simplicity in mind. Due to its simple design, the project is effective and has a high user acceptance rate [7]. provided as a fully accomplished service, so anyone doesn't need to have any kind of methodical acquaintance to set it up or keep the system running. Additionally, it is intended for quick deployment, enabling an organization to start operating in a matter of days. GilbyIM is a cloud-based platform that offers a fully managed service and is more than just an EDRMS (Electronic Document and Records Management system). Below is a list of GilbyIM's advantages [8]:

1. You won't need to worry about GDPR compliance. No more difficult file-retention planning
2. You can start using the software as a service model in a matter of days.
3. Make managing records less stressful
4. Sign up for GilbyIM for just one user per month and relax.

The subsequent figure 2.2.1 displays GilbyIM Interface.

Figure 2.2.1: GilbyIM Interface

2.2.2 MasterControl

Some of the biggest regulatory agencies in the world utilize this software. This document management program can handle intricate standards and requirements from all over the world [9]. Its primary goals are to lower compliance costs and boost internal productivity.

1. Master control has a centralized, secure repository that facilitates quick searches and information retrieval. Auditors just need to look in one location to find all they require.
2. The program has an automatic revision control feature that guarantees that only the most recent version of the document is accessible. As soon as a better revision is made available, the bad revision is dropped.
3. It offers standardized and customized reports and comprehensive analytics and reporting capabilities, including a dashboard and scheduling tools.

The following figure 2.2.2 shows MaterControl Interface.

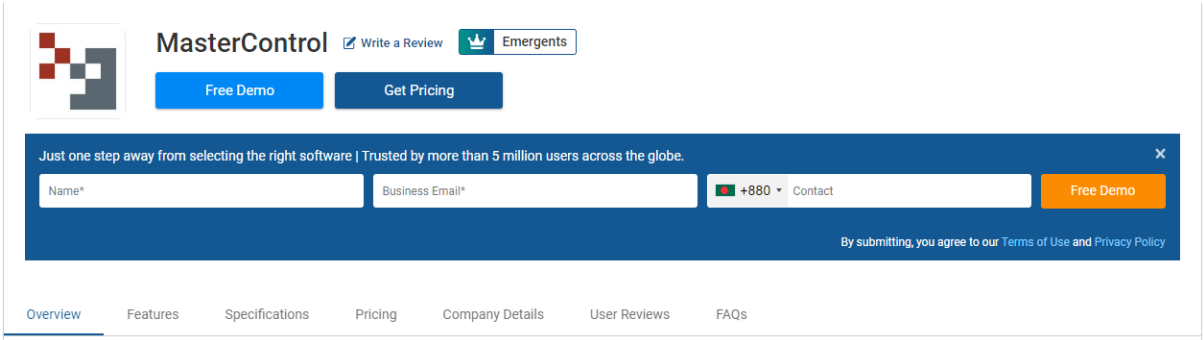

Figure 2.2.2: MasterControl Interface

2.3 Comparative Analysis

Comparative investigation comprises complementary objects in contradiction of one another to identify their resemblances and variances.

1. Document upload system are different, other mentioned organization upload templates and we have provision to upload document directly.
2. Mentioned other tools provide template but we don't provide it.
3. Our system provides alert notification before expired date but this feature, tools mentioned in other studies don't provide it.

2.4 Scope of the Problem

Defining the extensiveness of any kind of problem is vital before starting troubleshooting. It is necessary to determine what is functioning and what is not working while establishing the scope. By contrasting our PDRS with other, comparable web-based document storage systems, we have discovered some shortcomings that must be addressed. The study will cover the following areas:

1. Reviewing the literature
2. identifying research gaps
3. How to earn a profit while still offering all pros a low-cost solution
4. How to incorporate every conceivable user requirement into a single application
5. How to make it secure while still being user-friendly
6. How to get around the project's restrictions; etc.

2.5 Challenges

1. Build an attractive Block Chain Based public document record system that will fulfil user's requirements is the major challenge.
2. Maintaining the security of the database is also a crucial part of this project.
3. Make sure the user sign in/ sign up system is working properly.
4. Interruption of unauthorized visit to the administration panel.
5. Maintain high security in transactions.

CHAPTER 3
REQUIREMENT SPECIFICATION

3.1 Business Process Modeling

The utmost significant things for developing projects by knowing the overall requirements from software & hardware sites [10], [11], [12]. We Analysis Requirements for Block Chain Based public documents record system into subsequent stages:

1. Classifying the business frameworks
2. Steering stakeholder consultations
3. Making opportunities and necessities
4. Evolving source-to-target mappings

3.2 Requirement Collection and Analysis

1. Account Signup process is user friendly and independent of approval of admin
2. Confirmation mail for users from admin
3. Admin has authority to monitor profiles, make them warned, inactive or ban in case of any illegal activities
4. Provision for free trail and payment-based version for users
5. User Authentication Management
6. Easily manageable user account information
7. Profile sharing option
8. User Friendly Dashboard for All
9. Faster Page Loading for Lightweight Tools included Necessary Features

3.3 Use Case Modeling and Description

Use case modeling characterizes the interface. It can be made easier to provide information about any projects without showing any demo [13]. only this diagram can be made easier to know about the processes happen on the whole projects.

The following figure 3.3 shows the diagram of “Use Case”. A graphic depiction of a user's likely exchanges with a scheme is termed as use case diagram.

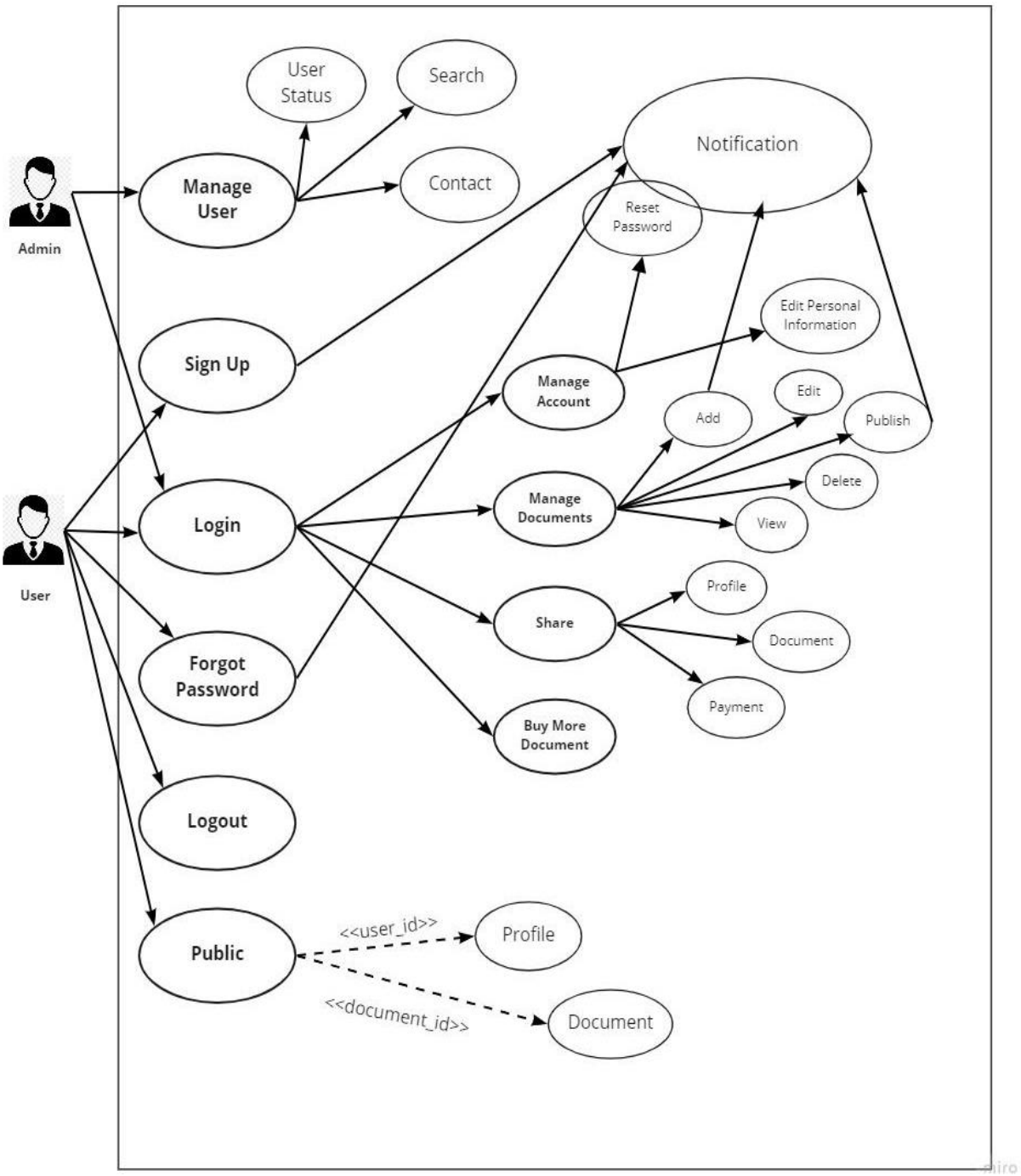

Figure 3.3: Use Case Diagram

3.4 Logical Data Model

The succeeding figure 3.4 displays the scheme as a solo process with its connection to exterior objects. It embodies the whole scheme as a single bubble with input and output data designated by inward/outward arrows [14].

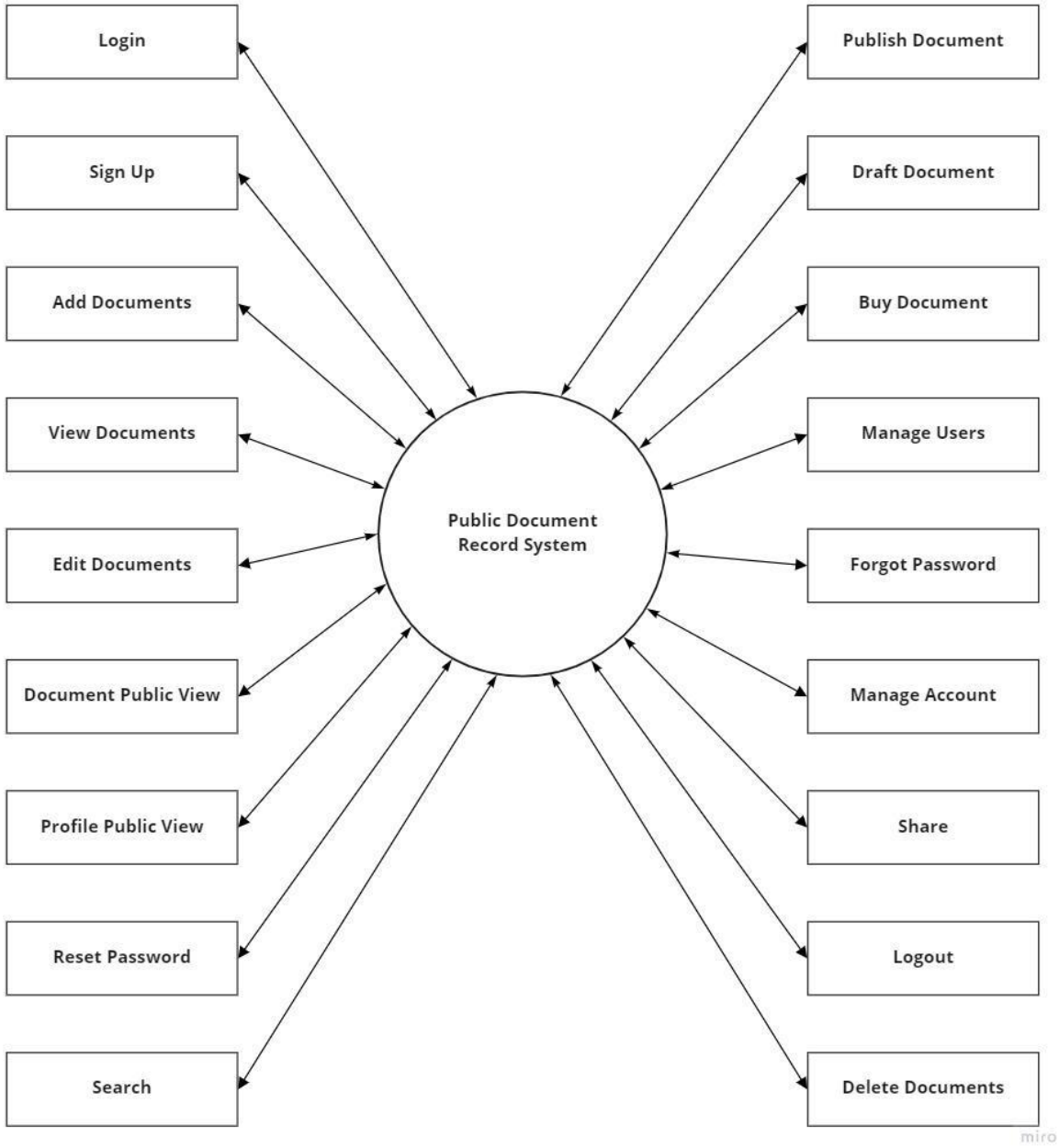

Figure 3.4: DFD 0 Level Diagram

The following figure 3.4.1 illustrates each of the main sub-processes that together form the complete system.

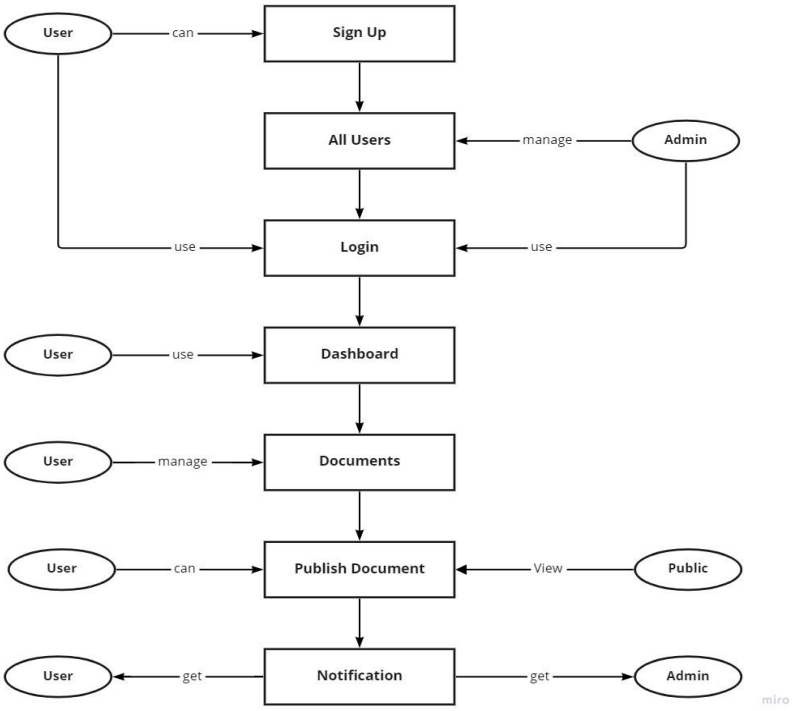

Figure 3.4.1: DFD 1 Level Diagram

The next figure 3.4.2 demonstrates a sequence of activities or flow of regulator in a system comparable to a flow diagram or a data flow diagram in the activity diagram.

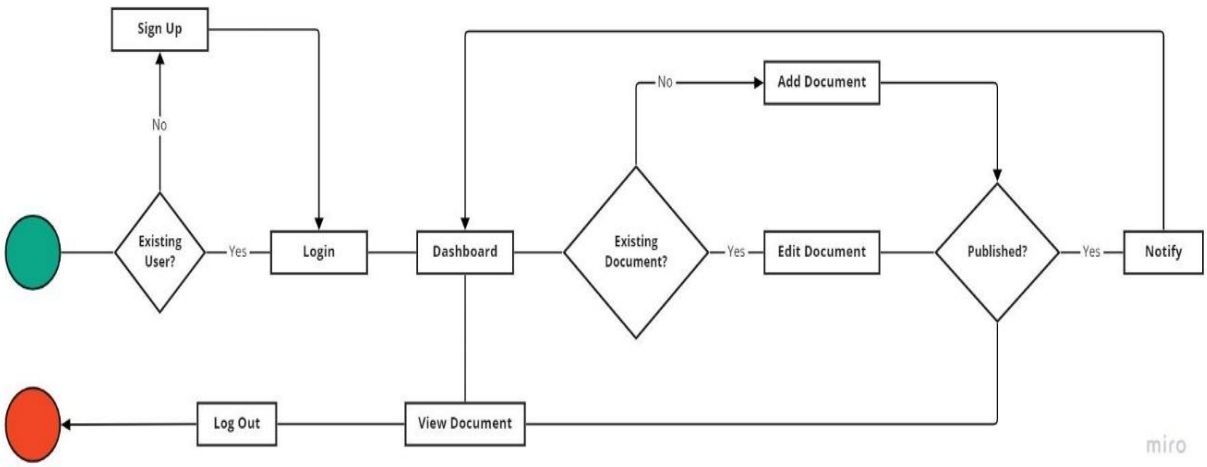

Figure 3.4.2: Activity Diagram

The subsequent figure 3.4.3 exemplifies the "Entity Relationship Diagram", also recognized as ERD is a illustration that displays the affiliation of entity sets stored in a recorded database [15].

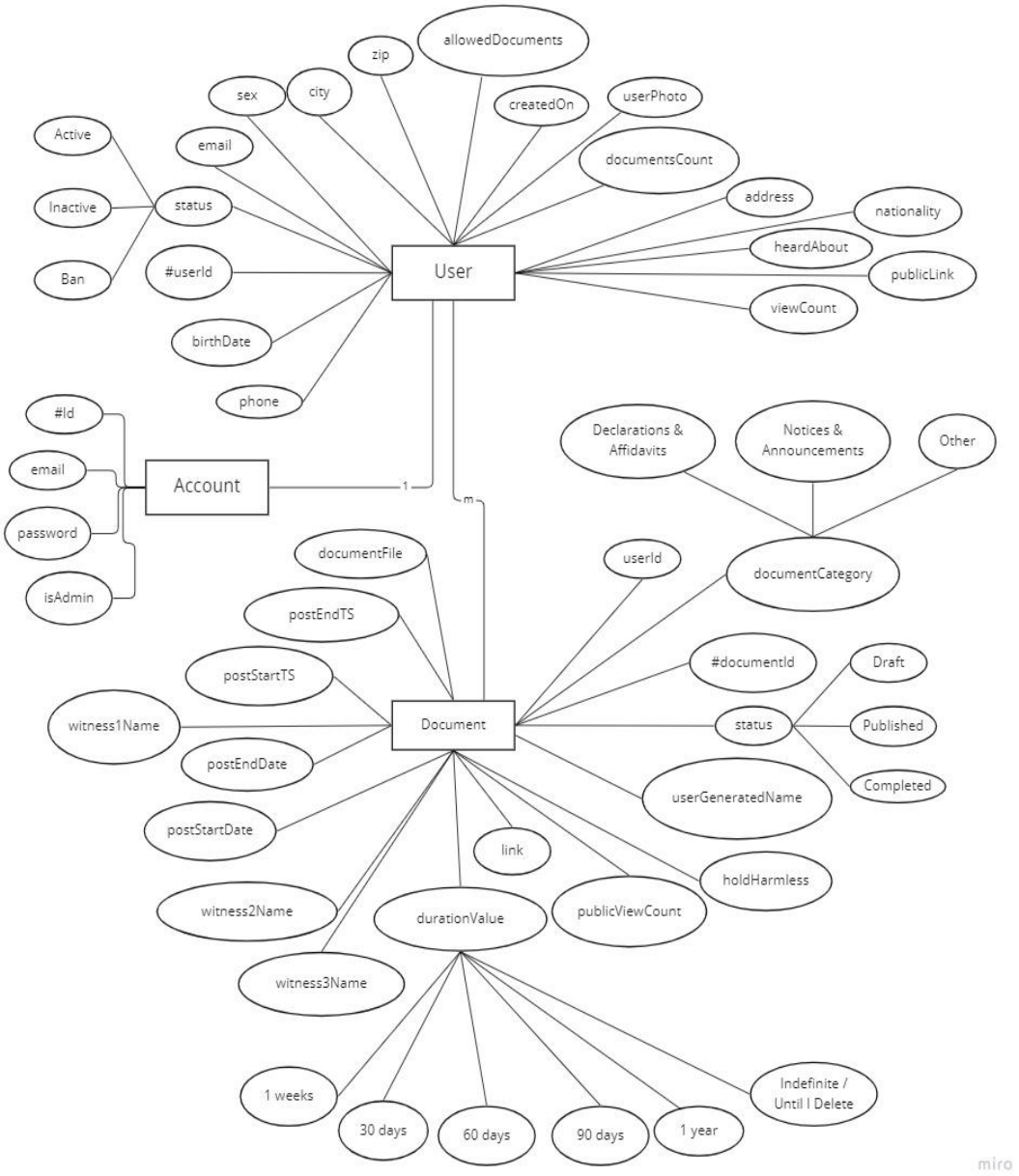

Figure 3.4.3: ER Diagram

The following figure 3.4.4 visualizes the processors of hardware/ the nodes/ and devices of a scheme, the associations of statement amid them and the settlement of the files of software on that hardware [16].

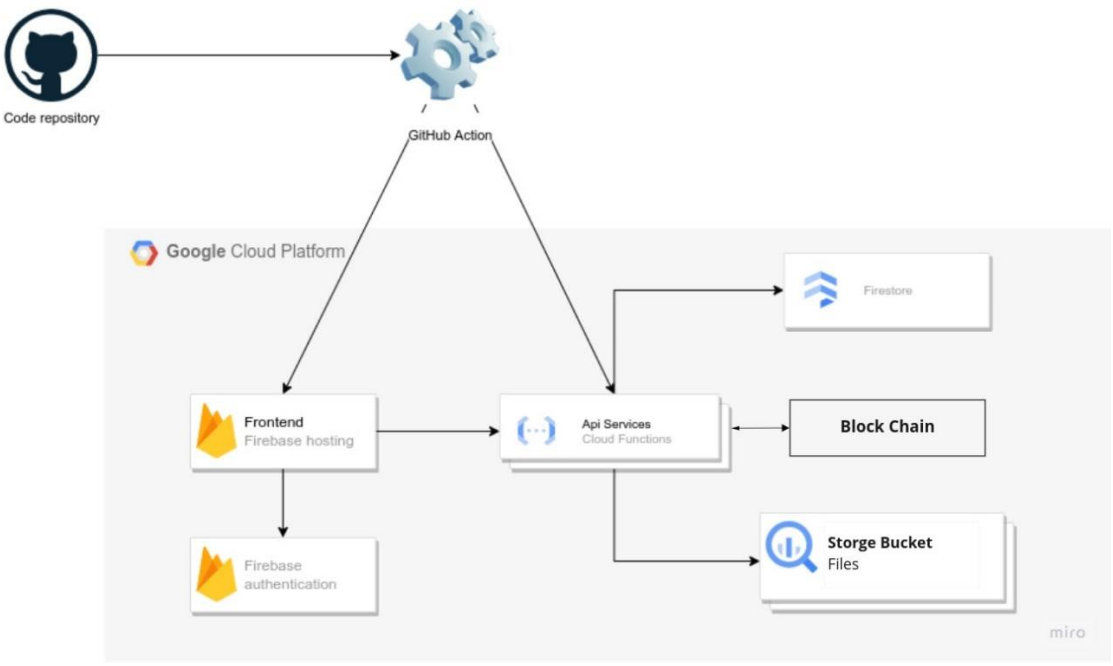

Figure 3.4.4: Deployment Diagram

The following figure 3.4.5 illustrates alert system checking algorithm in public document record system diagram.

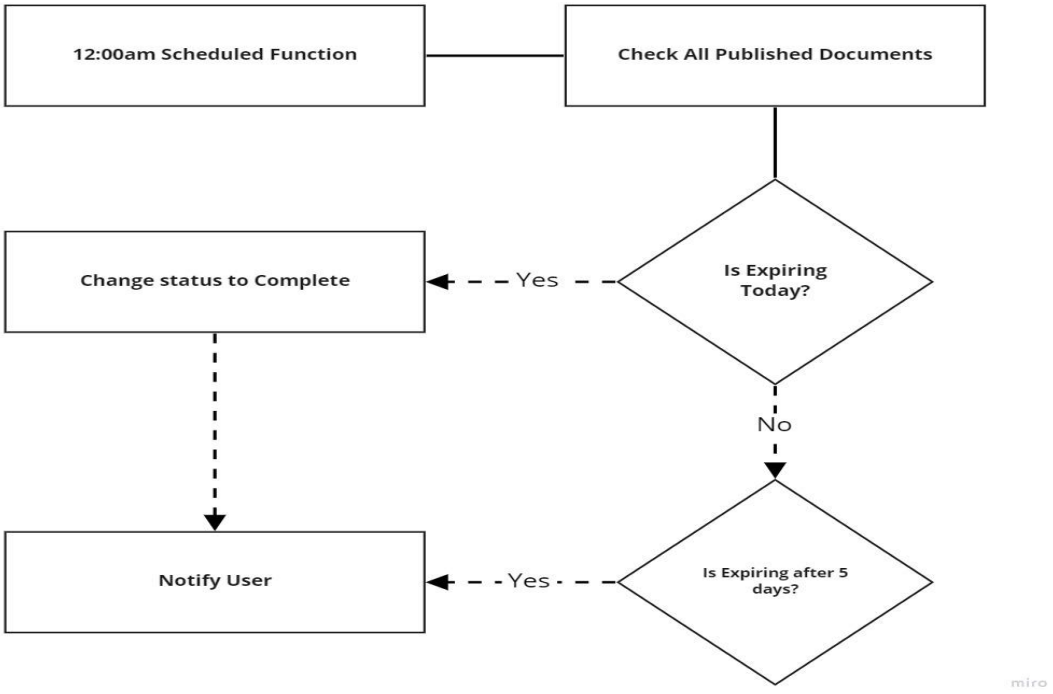

Figure 3.4.5: Public document record system diagram

3.5 Design Requirement

With this System Designs, we can easily determine the structures of our projects. Which tools need to be used for developing both software & hardware requirements. For the build this "Public Document Record System" Project we choose Web-Based Technology where the use of Webpack's development servers which shipes with create-react-app CLI & for Back-End we used Firebase cloud functions architecture with TypeScript. For Front-End use Tailwind CSS with custom design. We Make that cross-platform compatibility for the responsive technology.

Used Languages and Techniques

Help of Tools

1. Local Server : Webpack
2. Database : Firestore
3. Compiler : TypeScript ^4.5.4

Languages / Technologies

1. ReactJS
2. Tailwind CSS
3. TypeScrip
4. Express JS
5. FirePostmark
6. Paypal
7. CI/CD
8. Ganache
9. Solidity v0.5.0
10. Truffle 5.0.2

CHAPTER 4
DESIGN SPECIFICATION

With this System Designs, we can easily determine the structures of our projects. Which tools need to be used for developing both software & necessities of hardware.

4.1 Front-End Designs

Whole the thing a handler sees or interconnects with on a website when they visit it is called the front end. It is in charge of how an online experience looks and feels overall. Although the term "internet front ends" may sound a little technical, most of us come across them every day [17].

It can be said that the front end is an amalgamation of dual separate mechanisms: graphic design (the appearance) and user interface (the feel). Majority of the technical work on each of them was completed on the user interface employing web languages such as HTML, CSS, and JavaScript.

4.2 Back-End Designs

The structure that reinforces the front end, also recognized as the backend or server-side, is made up of mechanisms of a section of software that end users unable to see. The mind of a website is fundamentally its backend. Server that provisions data on request, the database where it is stockpiled, and the application that conducts it are all mechanisms of the backend.

A new website must have more backend components to be transformed into a very dynamic web-based application [18]. This is distinct from a static website, where the content frequently stays the same and a database is not required. All tasks involving a user interface that aren't handled by the backend engineers. This can involve creating utilities, libraries, and APIs.

They provide communication between the business and presentation layers. In disparity to frontend web designers, they play a considerable and highly concerted role in web development. Simply said, backend engineers write code to guarantee that everything works properly on the frontend. They generally spend more time than web

designers figuring out logistics and setting up algorithms to ensure the website functions properly.

4.3 Interaction Design and User Experience (UX)

4.3.1 Login Page

The resulting figure 4.3.1 displays the “login page” where users are asked to provide email and password to login into the application for registered users.

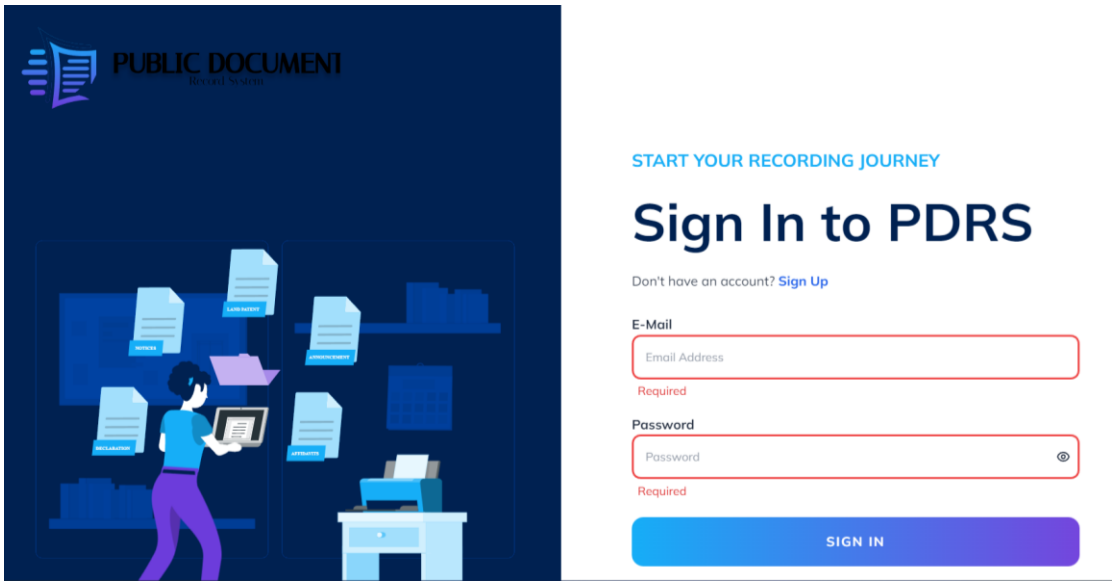

Figure 4.3.1: Login Page

4.3.2 User’s Sign Up

The next figure 4.3.2 illustrates the interface of the “sign up” page where users are asked to provide necessary information for registration purpose for new user.

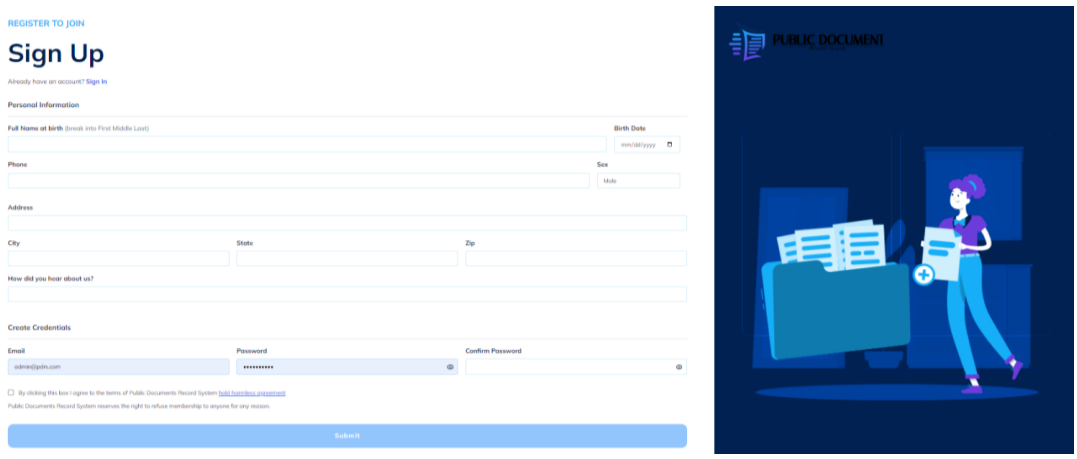

Figure 4.3.2: User’s Sign-Up Page

4.3.3 User's Sign In

The following figure 4.3.3 shows sign in page where users are asked to provide email and password to login into the application after registration.

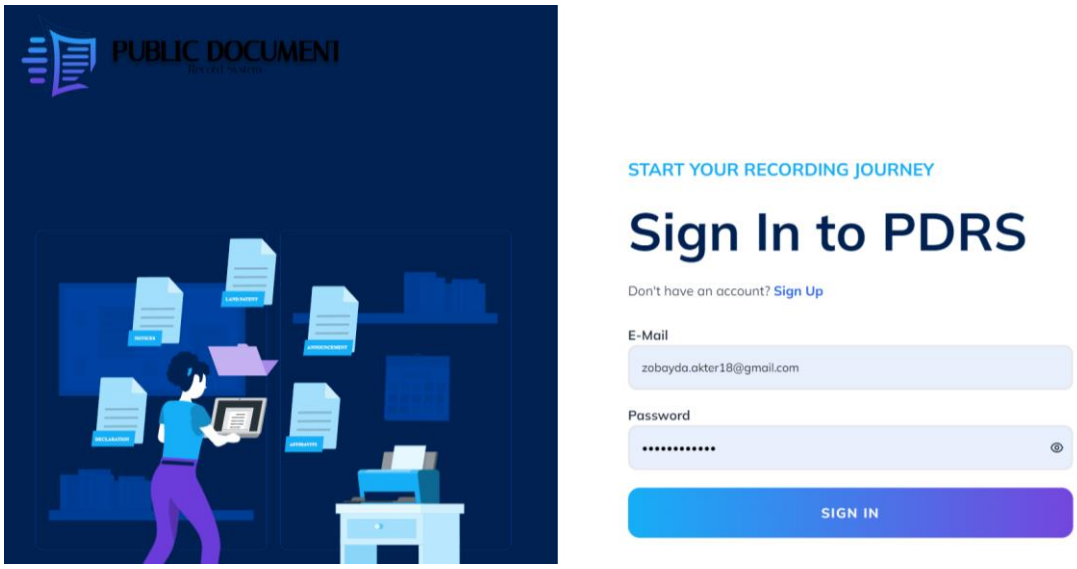

Figure 4.3.3: User's Sign In Page

4.3.4 User's Dashboard

The following figure 4.3.4 shows user's dashboard where users can see their records of documents, they can also upload, edit, share or remove from this interface.

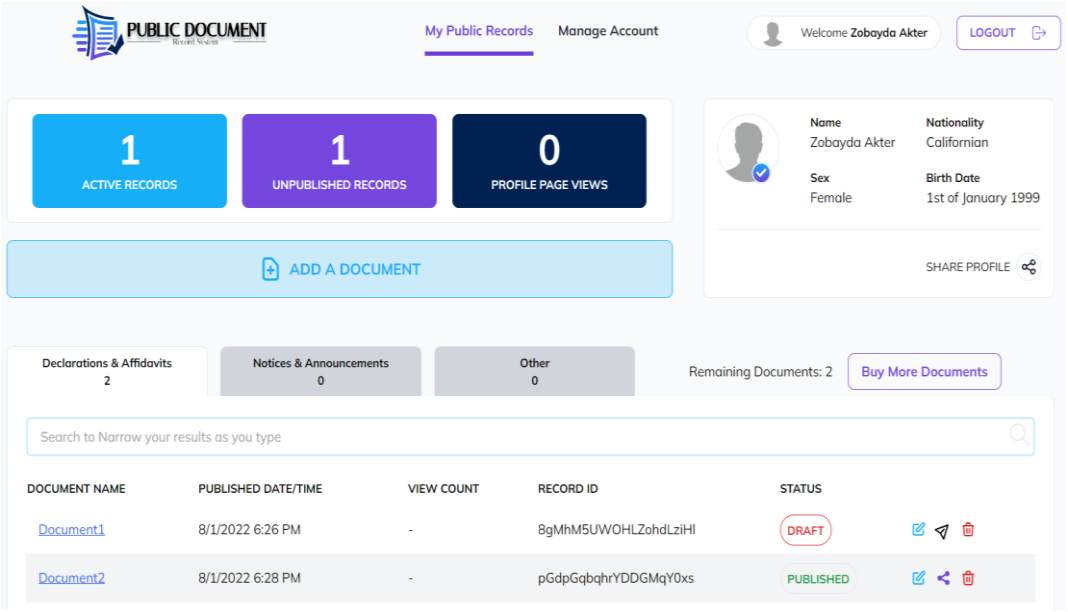

Figure 4.3.4: User's Dashboard

4.3.5 User's Document Addition Window

The following figure 4.3.5 shows user's document addition window page where users can add their required documents.

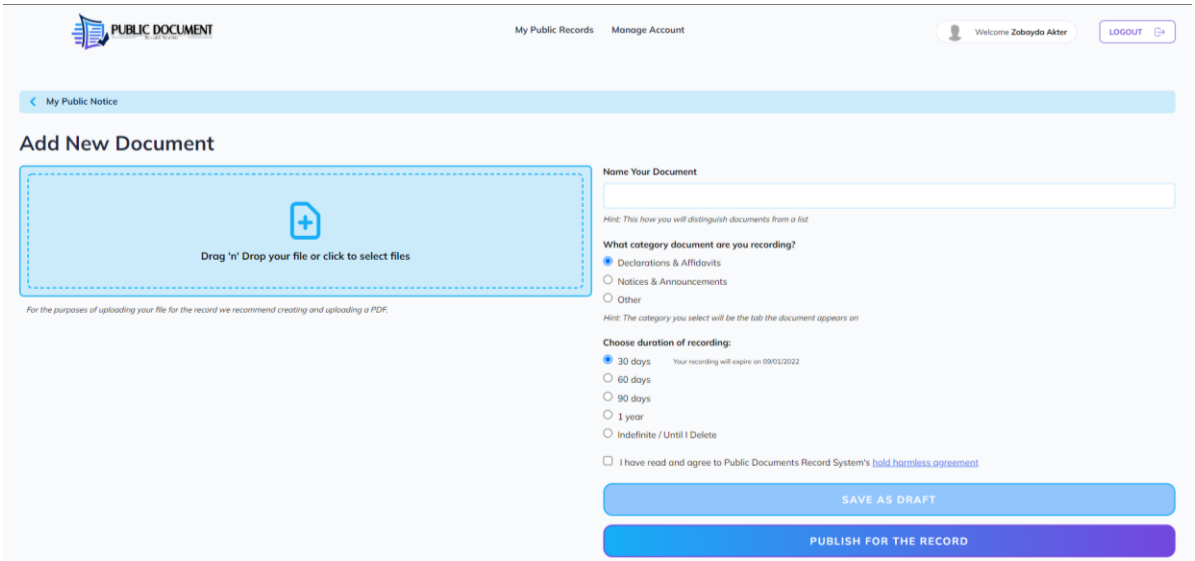

Figure 4.3.5: User's Document Addition Window

4.3.6 User's Account Management Window

The following figure 4.3.6 shows account management page where users can manage everything of their account.

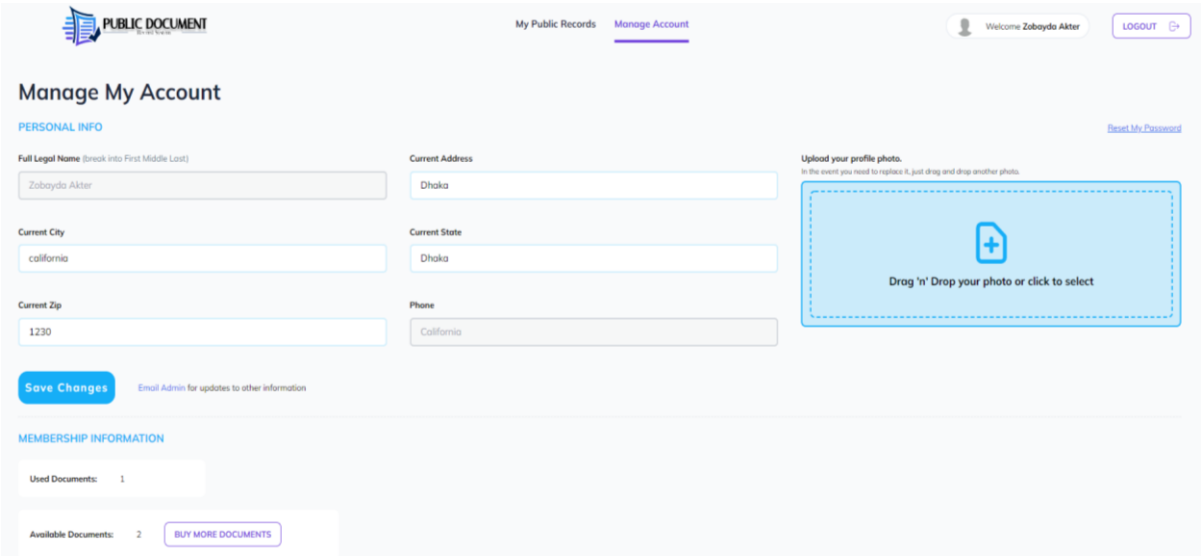

Figure 4.3.6: User's Account Management Window

4.3.7 User's Password Reset Window

The following figure 4.3.7 shows password reset window page where users can reset their password for security purposes.

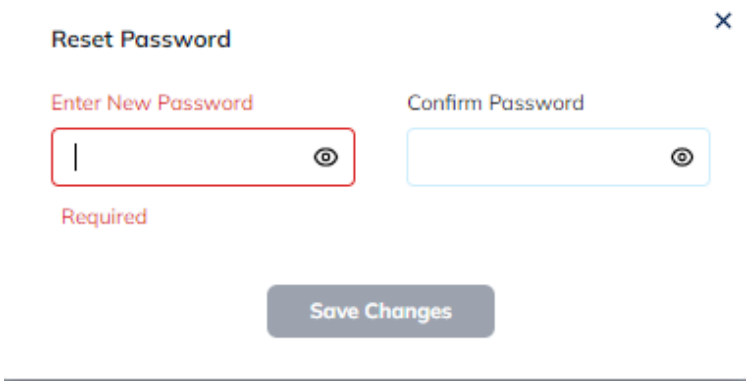

Figure 4.3.7: User's Password Reset Window

4.4 Implementation Requirements

For the build this "Block Chain Based Public Document Record System" Project we choose Block Chain-Based Technology where the use of

1. Webpack's development servers which shipes with create-react-app CLI
2. Back-End we used Firebase cloud functions architecture with TypeScript.
3. For Front-End use Tailwind CSS with custom design.
4. We Make that cross-platform compatibility for the responsive technology.

The subsequent figure 4.4 displays the "admin's dash-board" page where admin can monitor users, and they can take any required action if there are any security concerns.

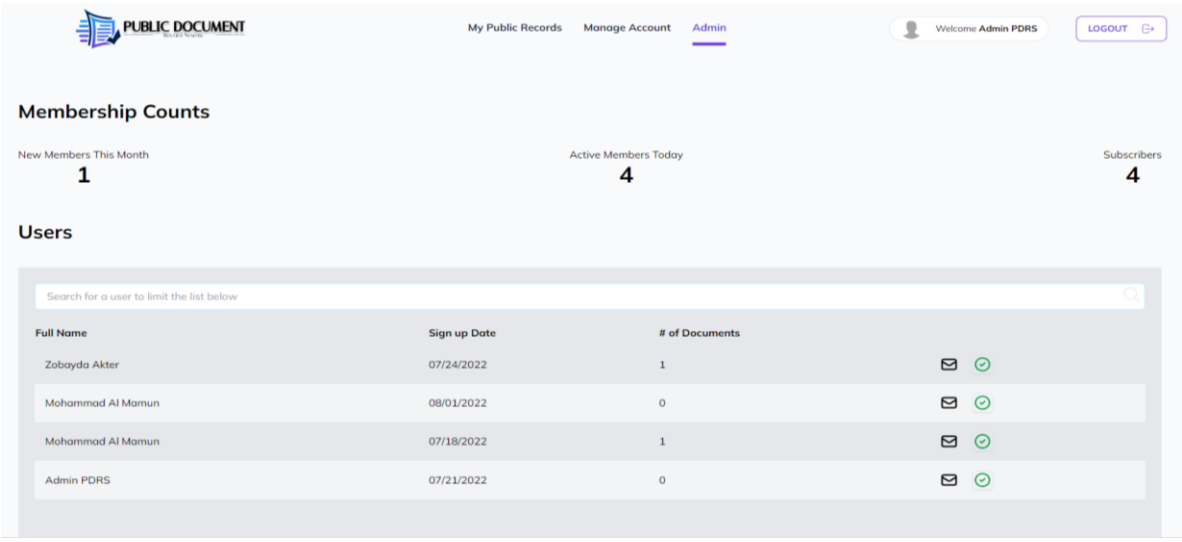

Figure 4.4: Admin's Dashboard

4.4.1 Payment Method

The next figure 4.4.1 displays payment means offered for this system.

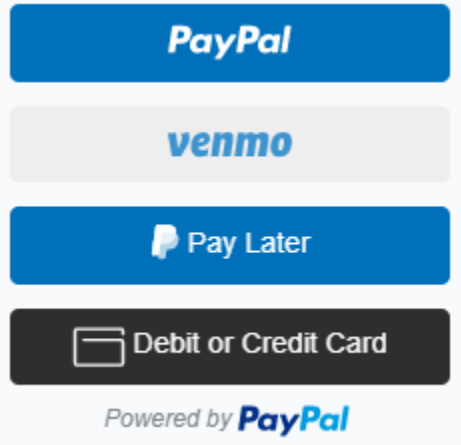

Figure 4.4.1: Payment Method

4.4.2 CI / CD Pipeline

The following figure 4.4.2 shows CI/CD pipeline. To proclaim a new variety of software, a constant incorporation and nonstop deployment (CI/CD) pipeline is needed. Through mechanization, CI/CD pipelines intention to advance software conveyance throughout the entire software progress life cycle.

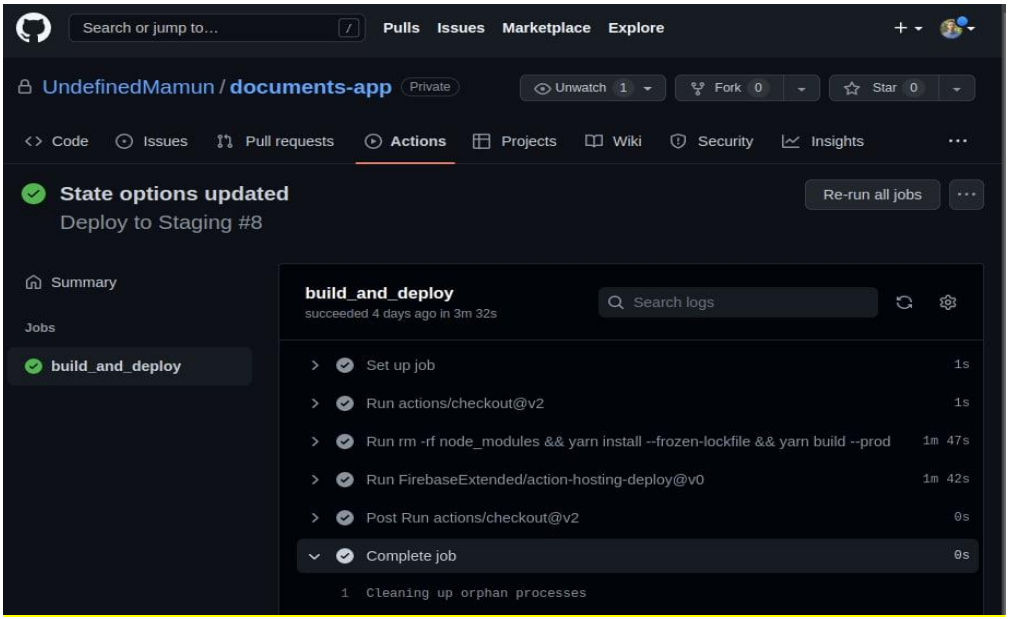

Figure 4.4.2: CI / CD Pipeline

CHAPTER 5
IMPLEMENTATION AND TESTING

5.1 Implementation of Database

For the development of the “Block Chain Based Public Document Record System” Project we choose Block Chain-Based Technology where the use of Webpack’s development servers which shipes with create-react-app CLI & for Back-End we used Firebase [19] cloud functions architecture with TypeScript. For Front-End use Tailwind CSS with custom design. We Make that cross-platform compatibility for the responsive technology.

5.2 Implementation of Front-end Design

The main objective is to create the front end to make sure that experience of the user was straightforward. We have therefore made an effort to keep them as straightforward as we can. When implementing the front-end design, we also keep in mind that it should be appealing and simple to use. The website's responsiveness to many device kinds, including laptops, tablets, and smartphones, is another crucial consideration. Included in our front-end design are the following:

1. Account Signup process is user friendly and independent of approval of admin
2. Confirmation mail for users from admin
3. Admin has authority to monitor profiles, make them warned, inactive or ban in case of any illegal activities
4. Provision for free trail and payment-based version for users
5. User Authentication Management
6. Easily manageable user account information
7. Profile sharing option
8. User Friendly Dashboard for All
9. Faster Page Loading for Lightweight Tools included Necessary Features

5.3 Testing Implementation

From user visits, we have not discovered any bugs. We must identify any significant issues and errors before launching our program so that we can quickly and effectively fix them.

To make that reliable, we therefore go through some testing procedures.

1. Functionality of the developed system
2. Serviceability
3. Interface of server
4. Record of database
5. Similarity
6. Achievement
7. Security

5.3.1 Functionality Testing

It checks all of the applications Pages, forms, cookies and database connection testing.

Testing Outputs:

1. Required fields must be filled out for the system to function properly
2. Default Values Re-Check again.
3. Duplicate and identical information won't be accepted in the database.
4. When Deletes cache then also deleted cookies.

5.3.2 Usability Testing

From the client side, check the general syntaxes & user-friendly settings.

1. No grammatical faults were discovered.
2. passed the Mobile & Desktop versions with flying colors.

5.3.3 Interface Testing

1. **Application**: Error Notifications given when users input invalid or null input.
2. **Web Server**: easily manages server Request.
3. **Database server**: show exact data after performing a query.

5.3.4 Database Testing

Essential Testing for Every Web Application, We Get this Result After Successful Testing:

1. Data is provided by CRUD operations 3x faster.
2. Execute the correct data from the database.
3. Query Response Time Was Faster.
4. Data can easily integrate with databases on the servers' side.

5.3.5 Compatibility Testing

Browser Compatibility Test:

Test from different browsers & get accurate responses from Google Chrome, Mozilla Firefox, Safari, Opera & Microsoft Edges.

5.3.6 Performance Testing

We test overall Performance & get this from Google search console.

1. The application can immediately receive a server response and information.
2. Quicker loading times.
3. Up to 91% faster loading times for desktop and mobile sites
4. Sometimes the application crashes due to extreme load, from such an occasion, how the site will be rerecovered from this.

5.3.7 Security Testing

We gave this challenging segment the required highest importance because it is one of the most crucial components of any software application. The results are below; let's have a look at them

1. The 404 Error page was automatically generated by a wrong URL.
2. Instant alert for incorrect access information.
3. Automatic session deletion for any inactive users

5.4 Test Results and Reports

It is greatly important to test a software as developing it [20]. It is tried our level best to make the “Block Chain-based” system safe. So, we have executed testing by applying some test cases for the developed system. Our testing report is exposed in the subsequent table 5.4.

Table 5.4: Testing Report

Investigation Number	Task	Investigation Data	Expected Findings	Actual Findings
01	Log in by using valid email and wrong password	Email: zobayda152263@gmail.com Password: 11223	Wrong username or password	Pass
02	Checking the input mail id is already Registered or not	Email: zobayda152263@gmail.com	Email is already taken	Pass
03	Log in with invalid email or password or both.	Email: nodemo@gmail.com Password: notwe	No user with this email	Pass
04	Log in with valid email and valid password	Email: zobayda15-2263@gmail.com Password: 112233	Redirect to Dashboard.	Pass

CHAPTER 6
IMPACT ON SOCIETY, ENVIRONMENT AND SUSTAINABILITY

6.1 Impact on Society

The system which is developed through this project has positive impact on society. More specifically the impacts on society have been listed below:

1. Online document and agreement creation eliminates the requirement for paper-based processes.
2. It also makes it easier for users to store their documents safely online.
3. People will be able to record documents without waiting in line and can access documents from any location.

6.2 Impact on Environment

In spite of having some adverse impact of block chain-based data storage system due to additional energy requirement, it has considerable positive impacts on environment too. It creates and promotes paperless storage system and reduces stress on trees. It can be said a green technology too.

6.3 Ethical Aspects

The paradigm change that underpins block chain-based storage system has substantial significances for computer ethics. The prime components of this alteration are:

1. The compromising of control to third-party facilities;
2. The statistics is kept on several websites that are run by numerous organizations; and
3. Several services interact with one another on the network.

In this developed system, ethical aspects have been considered and given top priority.

6.4 Sustainability Plan

The block chain based public document storage system is crucial in assisting businesses in becoming more sustainable. By lowering carbon footprint and associated expenses while promoting the research and innovation needed to create a sustainable future, it helps make the business case for a sustainable strategy.

CHAPTER 7
CONCLUSION AND FUTURE SCOPE

7.1 Discussion and Conclusion

This scheme is developed to attach with the Block Chain network. With this system a lot of time will be saved which can be concentrated on other vital areas of business. All the important and precious documents will be saved in one location instead of scattered around in a storage room through this system. Our Block Chain Based Public Document Record System can provide all the essential features of uploading, modification, sharing of documents with minimum hassle and in a secure manner.

7.2 Scope for Further Development

This is an early version of a big system. We shall approach potential clients for further business development through this service. We will integrate live chat & call options for better collaborations and SMS notifications features. The most important future plans are below.

1. Templates for contracts.
2. Taggable usernames for contracts.
3. User verification through the national Databases.
4. Improve privacy policy with advanced sharing options.

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