

**CENTRAL TENANT INFORMATION MANAGEMENT SYSTEM**

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

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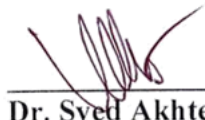
**DHAKA, BANGLADESH**

**DECEMBER 2019**

## **APPROVAL**

This Project/internship titled “**Central Tenant Information Management System**”, submitted by Syed Hasibuzzaman and Moyed-Al-Mamun Chowdhury, ID No: 142-15-3738 and 142-15-3783 to the Department of Computer Science and Engineering, Daffodil International University has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on 06.12.2019.

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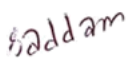
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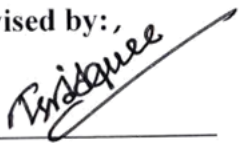
## DECLARATION

We hereby declare that, this project has been done by us under the supervision of **Aniruddha Rakshit, Senior Lecturer, Department of CSE** 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 or diploma.


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## ABSTRACT

These days managing tenant and tenant-related information have gotten a headache for the Govt. and law enforcement authorities in megacities like Dhaka and Chattagram as well as every other city. A manual handwritten form system is in place to keep such information but which has already been proven inefficient and at some degree obsolete to help when it is needed. We can digitalize this system and like any other digital system, it can become a very fast, reliable and efficient way of managing these information. This report illustrates such a **“Central Tenant Information Management System”** which will store and update tenant-related information with ease. The system aims to hold two interfaces for two different users – one is the house owner and the other one is the Govt. and Law enforcement authorities (Police). In this system, the homeowner shall register every tenant in each flat of a house with a specific web-based form and verify by uploading pictures of both sides of the NID which eliminates both the need for further verification and special equipment (Scanner, photocopiers, etc.). Once the data has been stored, it is available for the police. They can easily access to the information of peoples whereabouts if necessary (e.g. terrorism). The system also shall hold a left button to be used by the homeowner when a tenant legally leaves the house. That way the next homeowner shall know that this person left the previous home without any trouble and is a good tenant. Tracking electricity, gas and water bills are also possible. This way access to information becomes versatile and can benefit everyone greatly.

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# CHAPTER 1

## INTRODUCTION

### 1.1 Introduction

The present era have already become the era of ICT. Information technology have made our life easier in every aspects. The idea of securely storing peoples Identity and using that information for various purposes have already been a trend now. Almost all of the governments around the globe are using secured online databases for conveniently serving the people. New and newer ways of using digital data are being utilized to both save time and build reliable systems. The proposed Central Tenant Information Management System can efficiently manipulate the tenant data to provide hassle free and efficient management to all the stakeholders – the homeowner, the leaseholder and the law enforcement authorities.

### 1.2 Motivation

The whole world nowadays is in a bit of social unrest because of the rising risk of active terrorism and Bangladesh is no exception. It have become imperative to identify each and every person in an area for the sake of national security. But due to the lack of a proper database of people renting house without an efficient system the terrorist organizations are taking the advantage of the breech in the information management system that currently the Government is suffering from. Besides, utility bill paying and taxation should be much easier and simpler if combined with this database.

### 1.3 Objectives

- Develop a web-app which will utilize PHP, JS, Ajax, Bootstrap (HTML & CSS).
- Ensure easy and seamless access from any internet enabled device.
- Making the system secure in both user's end and backend.
- Hassle free and time-efficient access to data whenever needed.
- Make home renting simpler, easier and tension free.
- Greatly help the Law Enforcement and Civil Defense Authorities.
- Solve the utility bill pay problem.
- Tax collection made easy for the Government.

#### **1.4 Expected outcome**

The application will always be ready to provide information securely to specific user (e.g. Police) at the moment it is needed (e.g. Terrorists siege a house and Police needs to find out how many people are in there and who they are). This will make decision making much easier at the moment of crisis and could save lives. When renting out an apartment to a tenant the homeowner can easily provide needed documents within short time which will save them time and money, that way they will be interested to provide these data instantly, which in turn will ensure data integrity. Besides the homeowner can look up a person's previous staying records thus a tension free renting is possible. Utility bill and tax calculation becomes much easier and transparent.

## **CHAPTER 2**

### **BACKGROUND**

#### **1.1 Introduction**

Central Tenant Information Management System is a cloud software that aims to provide a complete solution to the apartment renting problems for tenants, homeowners and the Police. Besides that it may solve the hassle people face while paying utility bills and the hassle the Government faces while collecting taxes.

#### **2.2 Related works**

We have spent a plenty of time to find a project similar to this one in the internet but no such projects were found. People have done home related projects but those are completely separate from ours.

#### **2.3 Comparative studies**

There are many property management software available which emphasize on buy, sell and rent advertisements mainly. But no other software could be found who does the things our software is based on. Things that make our project from every other project are:

- Developed with a view to ensure security in the society.
- Providing the police with a significant edge in any investigation.
- Providing the homeowners with reliable information.
- Made easy to collect tenant related information for the Government.
- The Government shall have an idea of comparative population density in any area which will help to distribute resources and make plans accordingly as well as make various forecasts.

## **2.4 Scopes**

This is an ideal project to inherit for any level of Government starting from Union Council up to the municipalities of the capital cities wherever homes are rented. When this vast amount of data is stored and ready to manipulate, it will change the experience of concerned stakeholders.

## **2.5 Challenges**

The system is created for the entire population of the country so the size of the data shall grow exponentially. This huge amount of data needs to be managed efficiently. The system deals with national public data so any compromise in security leads to a breach in national security. Corrupted higher official could jeopardize the systems integrity.

## **CHAPTER 3**

### **REQUIREMENT SPECIFICATION**

#### **3.1 Introduction**

With conventional offline software the data resides in an isolated system which is not convenient in terms of accessibility and security as well as data redundancy. To resolve these issues cloud based systems and web applications were introduced.

#### **3.2 Web application**

A web application [3] denotes a software that runs on a remote server and accessed by user mainly through web browsers, dedicated Android or iOS apps can also be used. Our Central Tenant Information Management System is a sophisticated and responsive web application that runs smoothly with full functionality on any desktop, laptop, tab and smartphone. The user can easily register with the registration button. The home details also get added while registering a homeowner as that process is also implemented within the registration process. The police end will ensure access vast amount of data of any time that has been recorded in the database previously.

#### **3.3 Tools**

This project is built based on the ICT structure. It utilizes all the aspects of the ICT infrastructure. These can be parted mainly in two ways – the software part and the hardware part. The software part again parts into two, those are – front end and backend. Frontend is done with Bootstrap, HTML, CSS and JS. The backend part is done with PHP, MYSQL and AJAX. Then in the hardware part, for creating, maintaining and accessing the application respective user needs to use ICT devices such as desktop, laptop, tab or smartphone. Internet connection is imperative to run the application as it actually resides in a remote server.

### 3.4.1 Use Case Modeling and Description

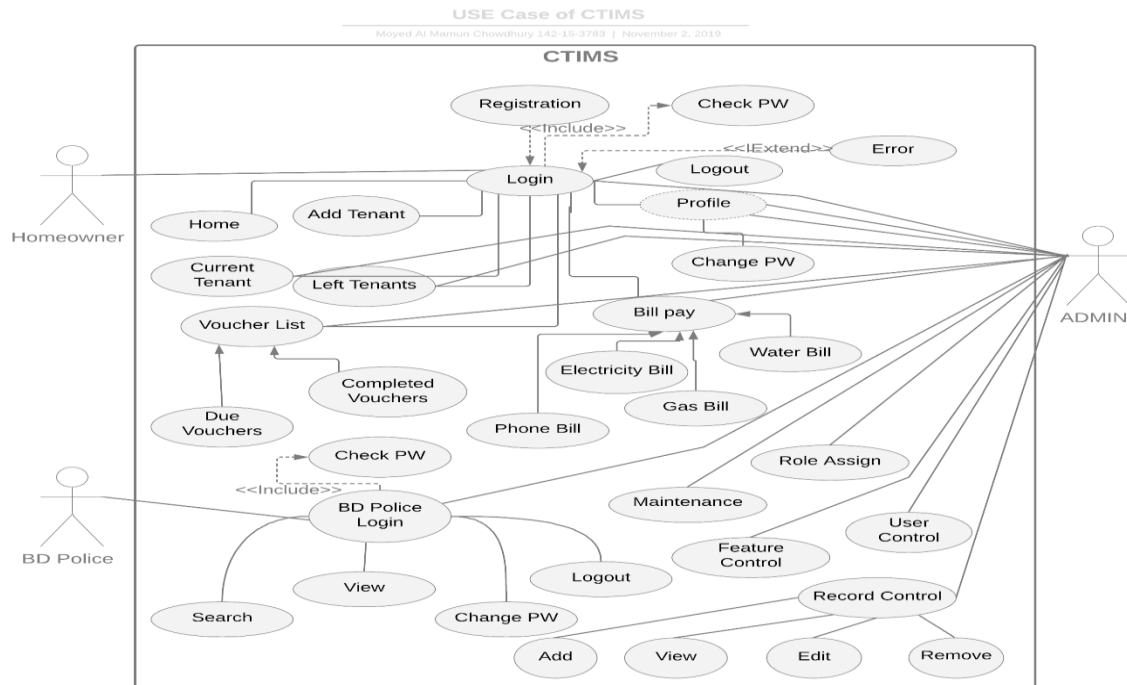


Figure 3.4.1: Use Case Diagram of Central Tenant Information Management System.

### 3.4 Use Case Data Model

The Central Tenant Information Management System is aimed to have three kinds of user and they are the Admin, the Homeowner and the Police (or any other law enforcement or Civil Defense authorities for that matter). The Admin shall have full access throughout the system and should be a higher official. The Admin can add and verify users and user data. Editing and removing any data should require special permission and shall not be granted to a single person. Instead a board shall have the authority to edit or remove records. This security measure is thought out to prevent any corrupted attempt of manipulating the system. Then there will be homeowners who will register through the registration process and will have to wait for admins approval. Lastly the Police is another user who can view all the data but cannot edit. Maintaining these strict security measures the system should ensure safety and integrity of data. To protect the entire system from external attacks, the system should use state of the art ICT security systems.

### 3.5 Flow of Data

The whole CTIMS system relies on its data. To manipulate this data we tried our best to design a simple yet secure and redundant data flow within the system. Here the major data providers are the homeowners. They will provide text information along with photographs of people and NID's. Police will be able to view all of the data but not to edit. The system admin will be able to control the system fully. Even if the homeowners delete some data from their end, the server shall hold of those data for further use and view by the Police.

#### 3.5.1 Level 0 Data Flow Diagram (DFD)

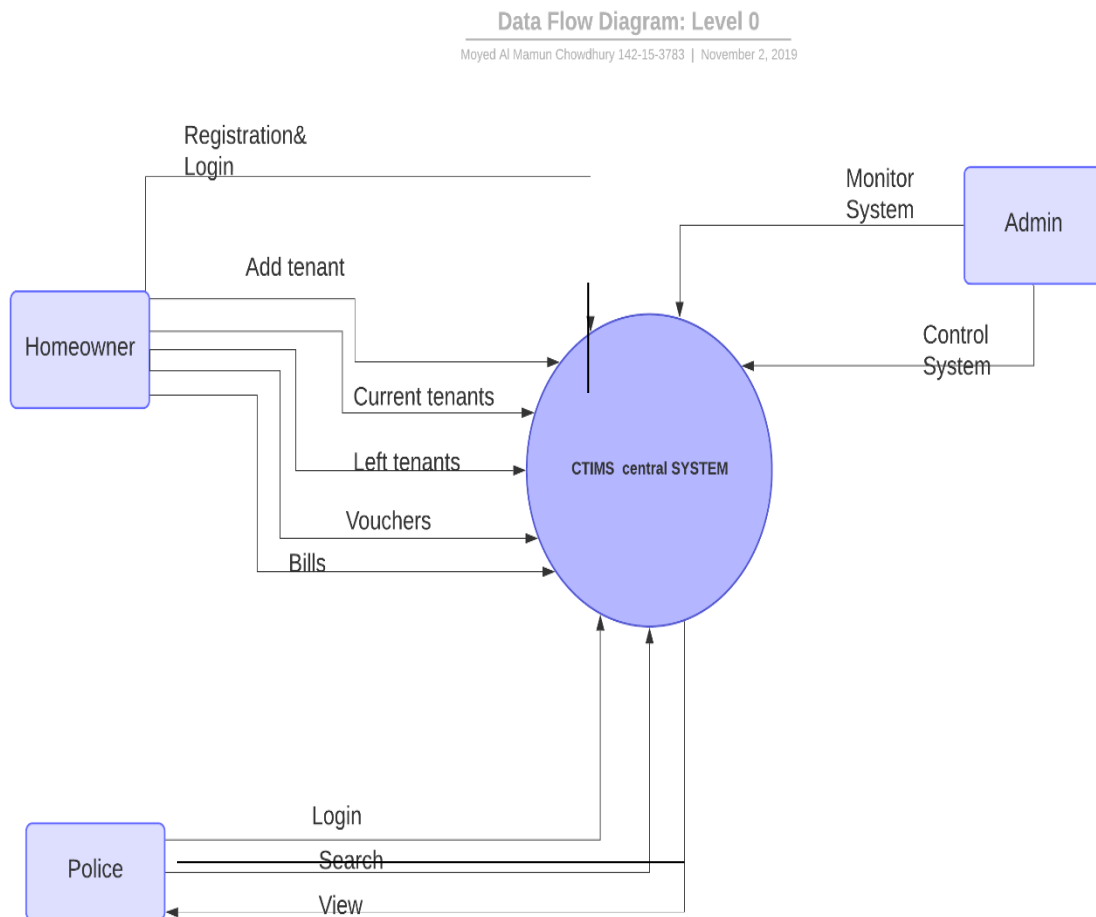


Figure 3.5.1: Context Diagram for CTIMS



### 3.5.2 Level 1 Data Flow Diagram

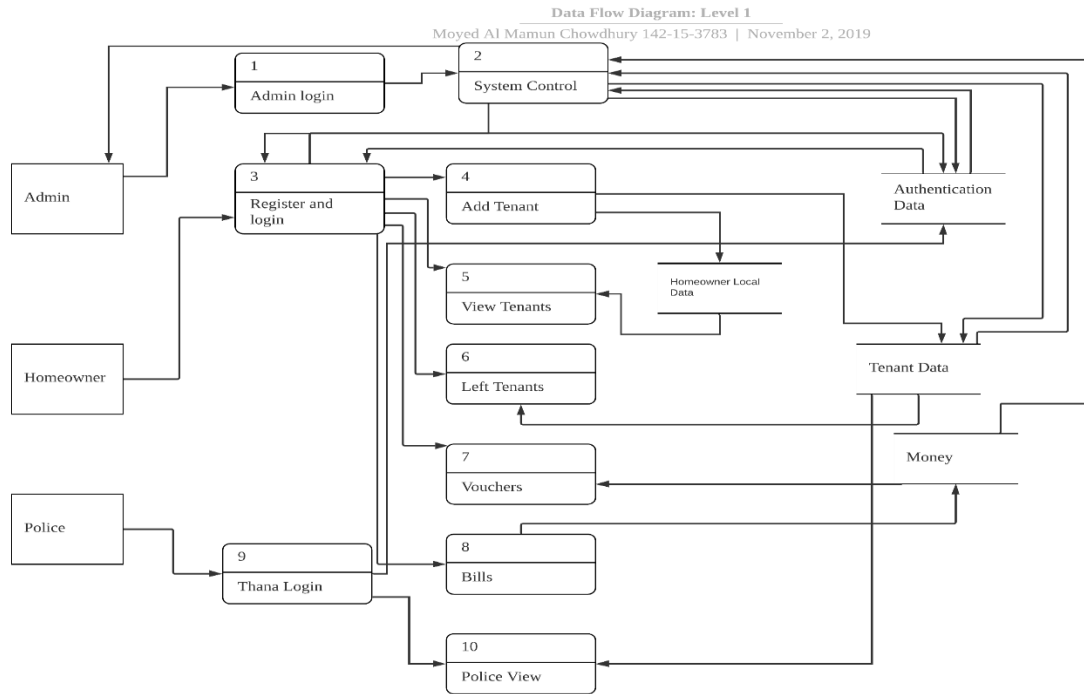


Figure 3.5.2: Level 1 DFD of CTIMS

### 3.6 Logical Data Model

The Central Tenant Information Management System is aimed to have three kinds of user and they are the Admin, the Homeowner and the Police (or any other law enforcement or Civil Defense authorities for that matter). The Admin shall have full access throughout the system and should be a higher official. The Admin can add and verify users and user data. Editing and removing any data should require special permission and shall not be granted to a single person. Instead a board shall have the authority to edit or remove records. This security measure is thought out to prevent any corrupted attempt of manipulating the system. Then there will be homeowners who will register through the registration process and will have to wait for admin's approval. Lastly the Police is another user who can view all the data but cannot edit. Maintaining these strict security measures the system should ensure safety and integrity of data. To protect the entire system from external attacks, the system should use state of the art ICT security systems.

## CHAPTER 4

### DESIGN SPECIFICATIONS

#### 4.1 Front-end Design

The Front-end design is mainly done with Bootstrap which is basically a combination of HTML, CSS. Web behavior is controlled with JavaScript and live updates and searches are enabled by Ajax.

Table 1: Front-end Design tools

<b>ID</b>	<b>LANGUAGE S&amp; TOOLS</b>	<b>PLATFORM</b>	<b>USE</b>
1	JavaScript	Event Control	Web technology that controls the behavior of the webpage.
2	Ajax	Live Updater	Updates a specific part of the webpage without needing to reload.(e.g. live search)
3	Bootstrap (HTML, CSS)	Design framework And Browser activities	Make responsive web pages that fits on cross platform devices.

#### 4.2 Back-end Design

The backbone of the project is PHP which makes up 45% of the web. The below table is a visual representation of design and development implementation.

Table 2: Back-end tools

<b>ID</b>	<b>LANGUAGES&amp; TOOLS</b>	<b>PLATFORM</b>	<b>USE</b>
1	PHP	MVC (Model-View-Controller)	Enables user to control the application and database.
2	MySQL	Database Management	Insert, Extract, Edit and Access data.

## CHAPTER 5

### IMPLEMENTATION AND TESTING

#### 5.1 Implementation of Database

**Executer:** This takes the tokens of the SQL and from it basically relational algebra is translated. Optimizing each relational algebra fragment the tokens then passed down the levels to be acted on.

**User:** The concept of the user is a requirement at this stage. This gives the query context, and also allows implementing security to on a per-user basis.

**Transactions:** A transaction model is used to execute the queries. The same query from the same user can be executing multiple times in different transactions. Each transaction is quite unique.

**Tables:** The idea of the table structure is controlled at a low level. Much security is based on the concept of tables, and the schema itself is stored in tables, as well as being a set of tables itself.

#### 5.1.1 Database Development

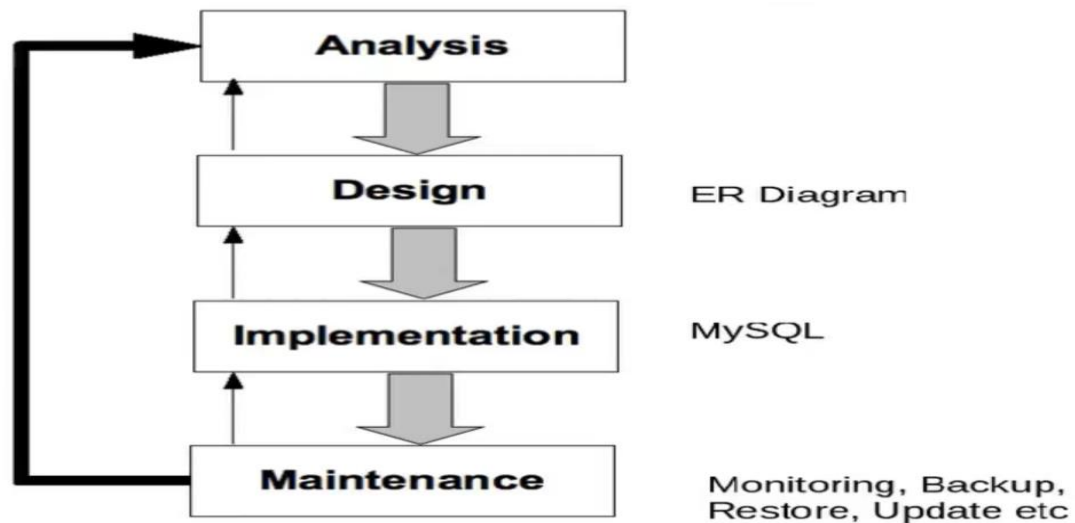


Figure 5.1: Database Development Process.

## 5.1.2 CTIMS ER Diagram

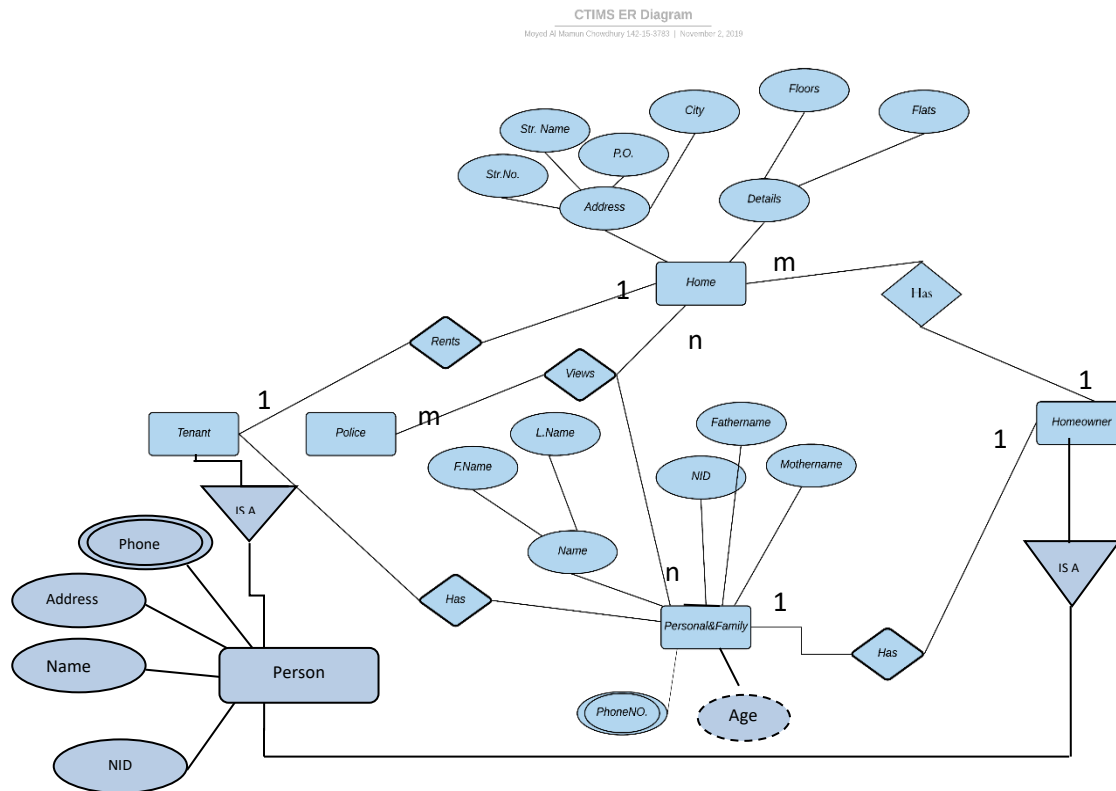


Figure 5.4: CTIMS ER Diagram

### Description:

In a practical scenario, one tenant rents one home and a homeowner can have multiple houses. Many police officers from many Police Stations view many tenant information. Again, one person belongs to a family.

### 5.1.3 CTIMS Database Implementation Model

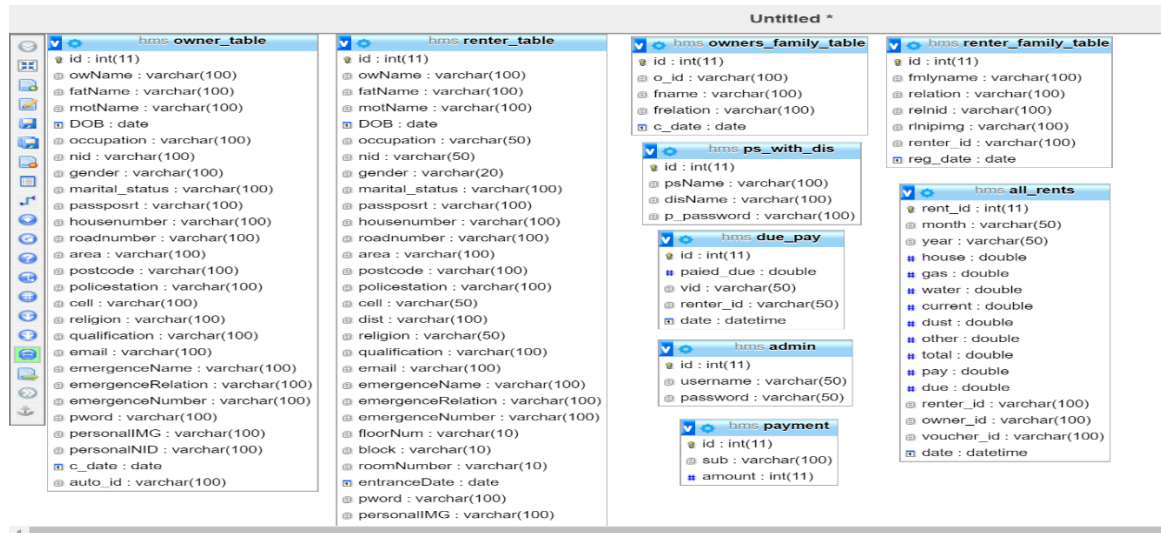


Figure 5.5: Database model of CTIMS.

### 5.3 Implementation of Interactions

A web app is meant to be complete tasks assigned by the user rather than just find information on the web. That way the user journey needs to be somewhat linear because the user needs to complete forms and follow instructions. The primary concern of a web app is workflow by interacting with the user. So, the implementation of a web app is imperative to be interactive. The interaction design was done keeping efficiency, productivity, ownership, convenience and learnability in mind.

Since an analytical approach to interface design improves the user experience, we managed our data in a way that is described below:

Efficiency: Use larger buttons to emphasize importance of features.

Productivity: Write labels with descriptive text and relevant use of input controls.

Ownership: provide the user with a visible status of the app and their data.

Convenience: Give recognizable default values for forms and update with connected suggestion to the screen when needed.

Learnability: the interface should help the user to assume necessary information and provide with a learning curve.

Designing forms:

Ensure if the form is really necessary.

Reduce fields where possible.

Keep text labels small and precise.

The user should know upfront what it is they need.

Be flexible with what your forms accept as input.

Display proper feedback right after a form is submitted by the user.

#### **5.4 Testing Implementation**

The development of a software is a fairly complicated process. A lot of components work together to initiate and continue the system action. Many of them are developed separately and then merged. To ensure the system's credibility, it needs to be tested thoroughly.

### 5.4.1 Home page of CTIMS



Figure 5.4.1: Home page of CTIMS

In the home page there are three options for three different user types. Respective users will click to enter their login panel.

## 5.4.2 Login page

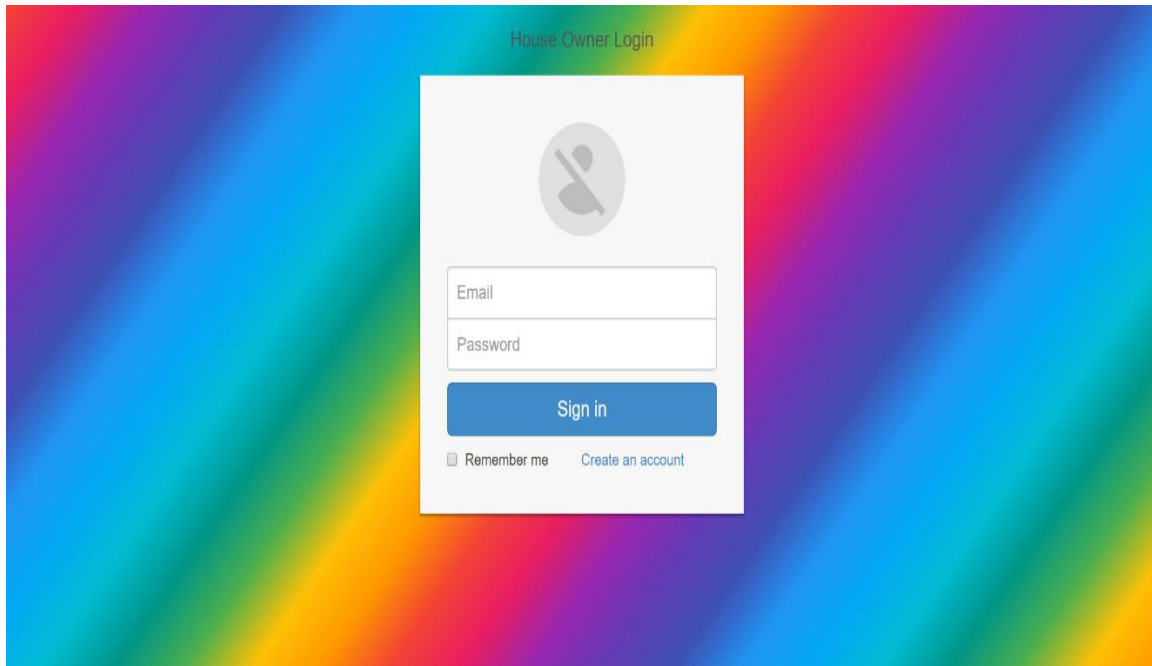


Figure 6.2: Login page of CTIMS

A user friendly login page has been added once the user chooses their category. If the user is already registered then they only need to provide username and password. If not registered then they have to click to create an account.



### 5.4.3 Registration page of CTIMS

CHTMS Home Add Renter View Current Renters View Left Renters Voucher List Bill Pay Logout Profile

### Renter Registration Form

Personal Details:

Renter Name	House / Holding Number
Father's Name...	Road Number
Mother's Name...	Area
Date Of Brithday	Post Code
Occupation	Police Station
NID Number	Cell Number
Email	District
passport	----Select Religion----
----Select Gender----	----Select Your Educational Qualification----
----Select Your Marital Status----	

Next

● ● ● ● ●

Figure 6.4: Registration page of CTIMS

In the registration page, the new user have to provide required information according to the form. Once filled the user shall click to go to the next page. The form will check if all the necessary data have been provided. If no error is found then the next page will come and so on. If some error is found then the page will notify the user and will not enable to go to the next page.

#### 5.4.4 Homeowner's page

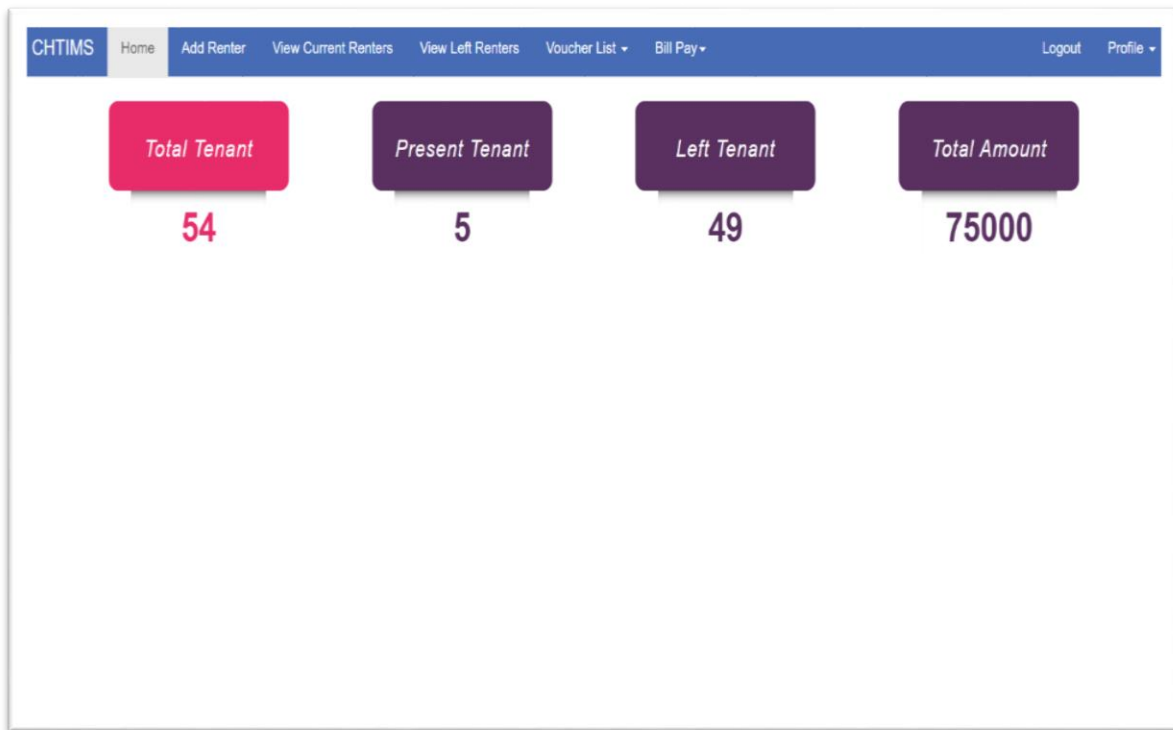


Figure 6.4: Homeowner page of CTIMS

The initial homeowner page showcases the general information like the number of tenants, past tenants, total rent amount. It will have a navbar which will show the other functionalities like add tenant, View current or left tenants, vouchers bills etc. From there the user shall enjoy further functionalities.

#### 5.4.4 Test Results and Reports

The system was tested thoroughly and all the components were opened and used as it is intended to be used. Data input was done along with photographs. Everything ran smoothly.

## **CHAPTER 6**

### **CONCLUSION**

#### **6.1 Conclusion**

The world is changing rapidly and numerous people are moving into cities for various reasons like job purposes, study, etc. They move into cities and rent apartments for staying. This is creating a considerably difficult situation for the Law Enforcement Authorities as they have no proper information of who is staying where. Criminals and terrorists are taking this advantage and committing crimes without the fear of being identified. Also, some fraudulent tenants stay in a home for a time and leaves without paying the rent. Then there are natural calamities like earthquakes and accidents like fire etc. Altogether managing the increasing population in cities is becoming more and more difficult for concerned authorities. Right tools at the right moment can alter the course of any situation, especially dire ones. And what tool is better than accurate information? It enables rapid decision-making for efficient operation. The CTIMS is aimed to record and provide all the needed data in a centralized system very efficiently. Not only it will help the homeowner to manage their homes very easily but also it will help the police for their inquiries, the Fire Service in case of calamities and the municipality to plan resources accordingly. It also will be of great help for tenants as all the data is going to be stored in a way that the homeowner cannot alter at will, it can be used as a proof if there is any misconduct. Thus, this can become a beloved system for people at different levels by making their lives much easier and simpler. And by using this system we are not only helping the police but also making our lives secure and easier.

#### **6.2 Future scopes**

Currently, this is an amazingly responsive web application, but we have the ambition for developing apps for Android and iOS for even better accessibility.

- Emergency services can be merged with this system.
- Area-wise home vacancies can be published for easy renting vacant apartments.

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