CHAPTER 2

DESIGN

2.0 Introduction

Systems design is the process of defining the architecture, modules, interfaces, and data for a system to satisfy specified requirements. Systems design could be seen as the application of systems theory to product development. System design gives the entire picture of the application and interactions of its components.

2.1 Project Plan

PHASE	NAME	DESCRIPTION	START DATE	END DATE
Phase I	Analysis	Understanding the problem, existing solution and defining the proposed Solution	19.01.2021	23-02-2021
Phase II	Design	Designing the project	24-02-2021	02-03-2021
Phase III	Implementation	Coding and Implementing	03-03-2021	19-03-2021
Phase IV	Testing	Testing the system	21-03-2021	30-03-2021
Phase V	Documentation	Preparing the document	01-04-2021	05-04-2021

Table 2.1 Overall plan

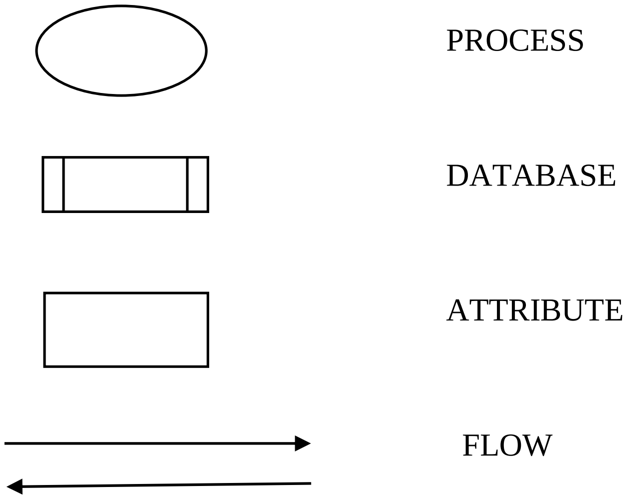
2.2 Description of the method of solution

The existing system does not contain the Block Chain Technology for the application with High Security and Safe Processing of the users account transaction. The previous Application and other banking application are not having the technology of the block chain and believing in the third party application for the data security. The proposed solution contains the Secure and Safe transaction for the users and Processing the application in 24*7 at any location for safe and secure process. It also includes the database as the permeant storage in the block chain.

2.2.1 Data flow diagram

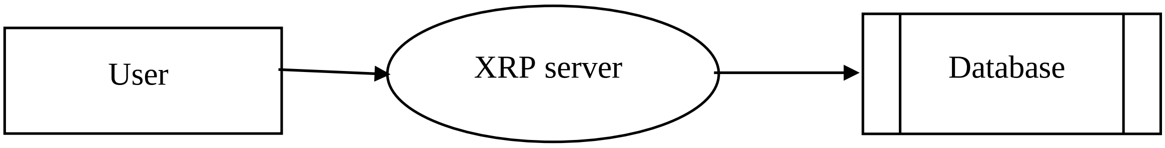
A Data Flow Diagram(DFD) is a graphical tool used to describe and analyse movement of data through system. It is a graphical representation of the "flow" of data through a computer system or a data or it looks at how data flows through a system. These are central tool and basic form which the other components are developed. The transformation of data from input to output, through processed may be described logically and independently of physical components associated with the system. The development of DFD is done at several levels. The flow diagram describes the boxes that describe computations, decisions, interactions & loops. It is important to keep its mind that the flow diagram are not flowchart and should not include control elements.

A Data flow diagram (DFD) is a graphical representation of the "flow" of data thought an information system, modelling its process aspects. A DFD is often is often used as a preliminary step to create an overview of the system, which can later be elaborated. DFDs can also be used for the visualization of data processing.

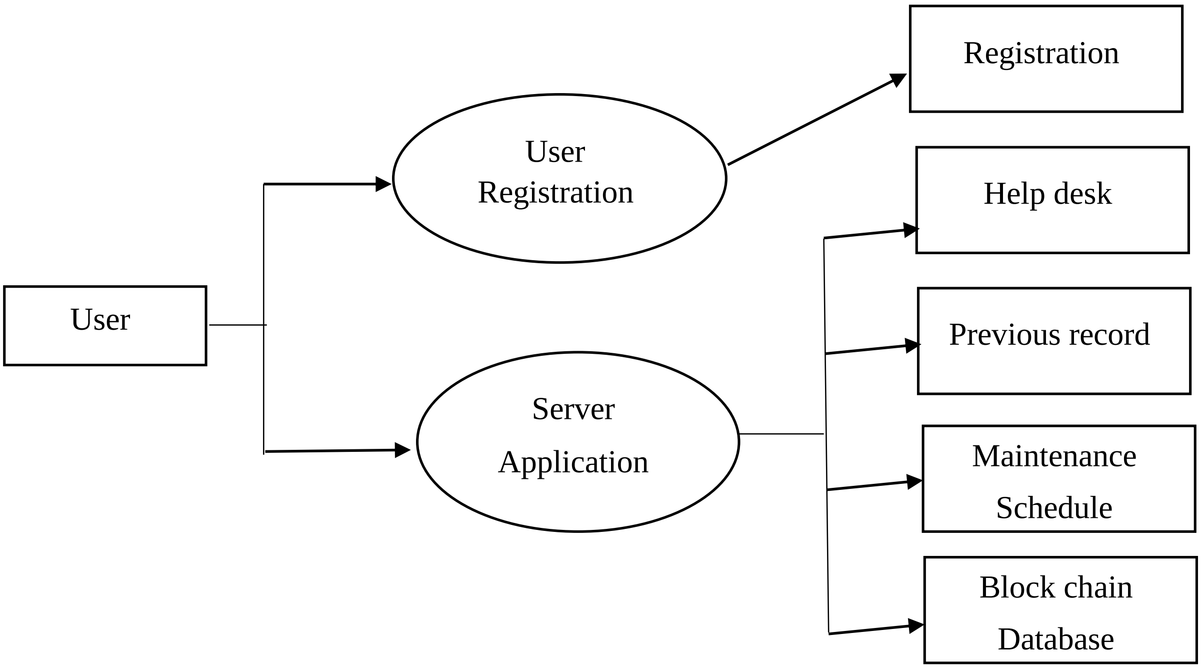


A DFD shows what kinds of data will be input to and output from the system, where the data will come from and go to, and where the data will be stored. It does not show information about the timing of processes, or information about whether processes will operate in sequence or in parallel.

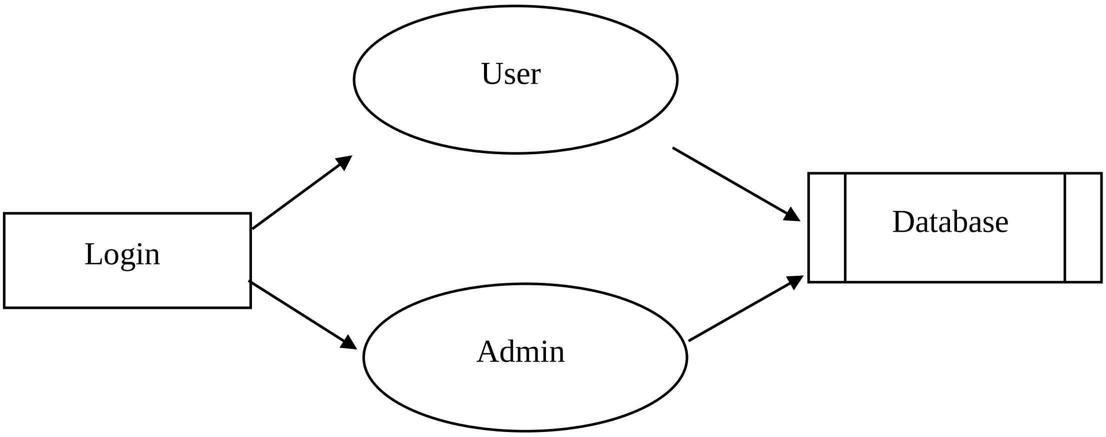
DFD Level 0



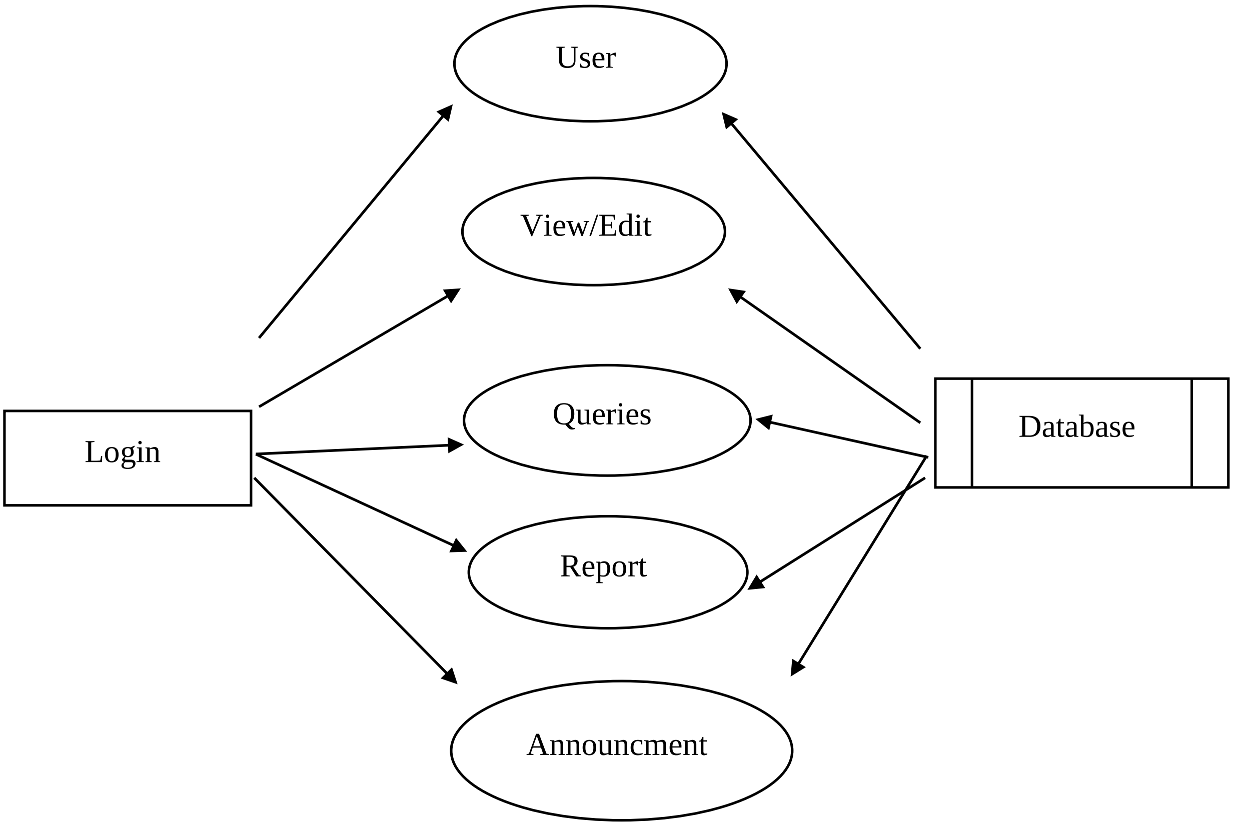
DFD Level 1



DFD Level 2



DFD Level 3



2.2.2 Pseudo form

GUI design is a type of interface that allows users to interact with electronic devices through graphical icons and visual indicators such as secondary notation as opposed to text based interface, typed command labels or text navigation.

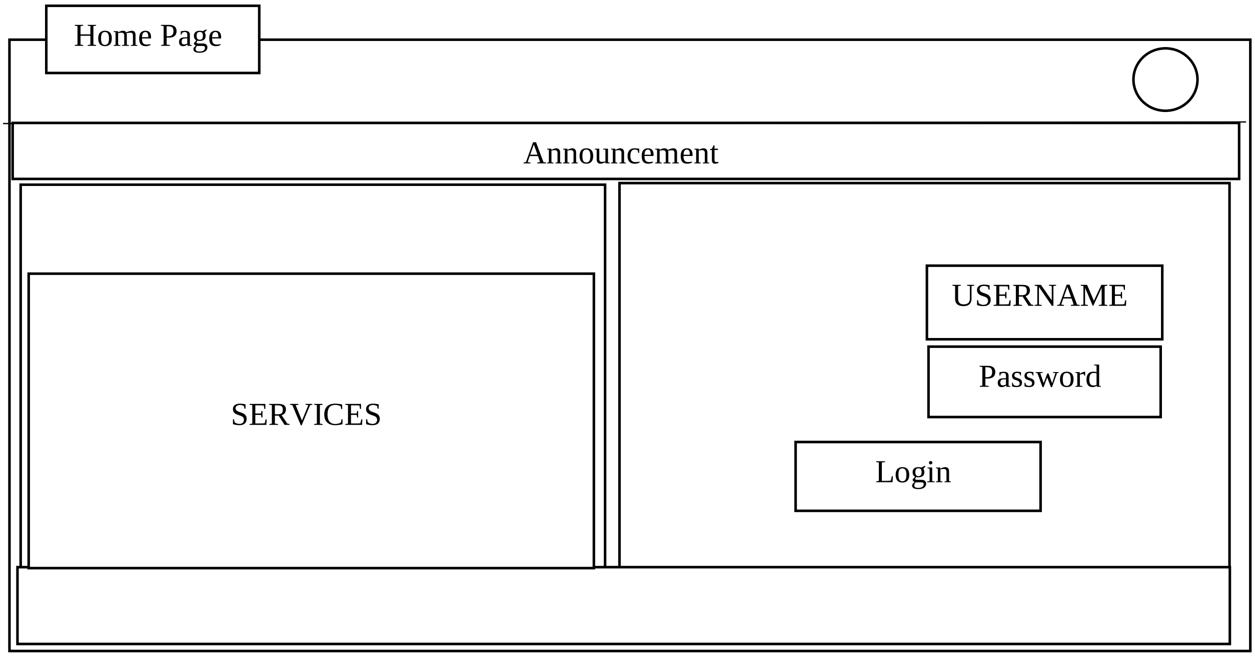


Figure2.1 Homepage

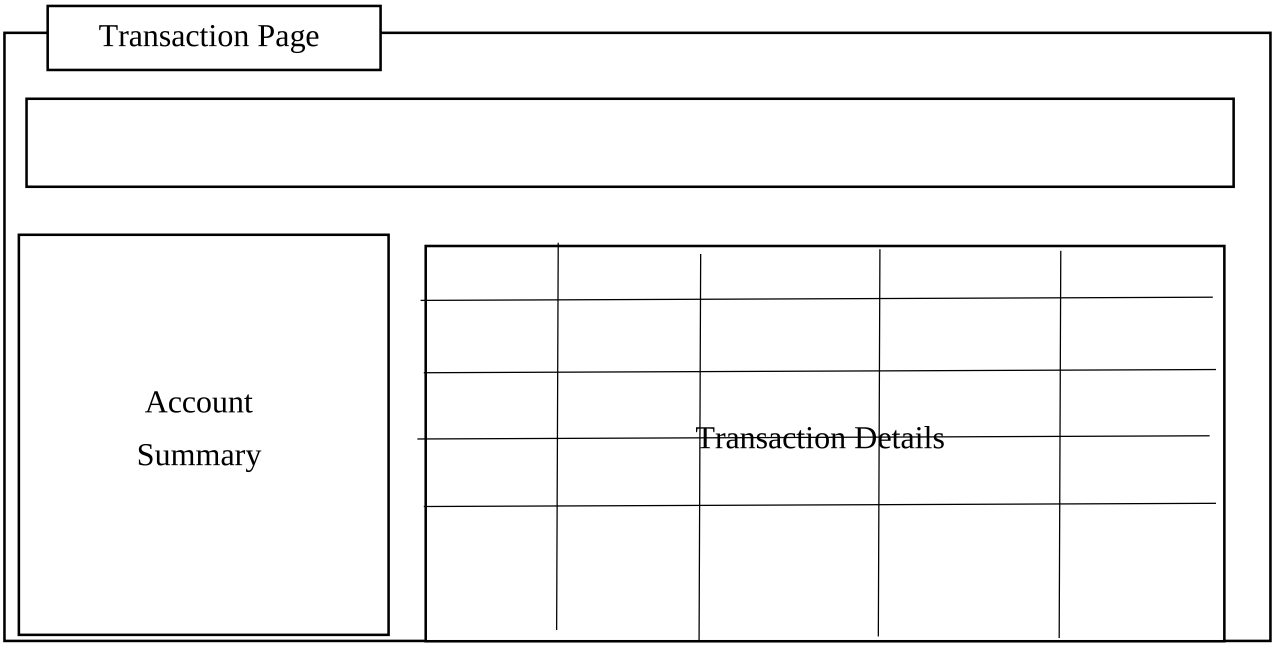


Figure2.2 Transaction Page

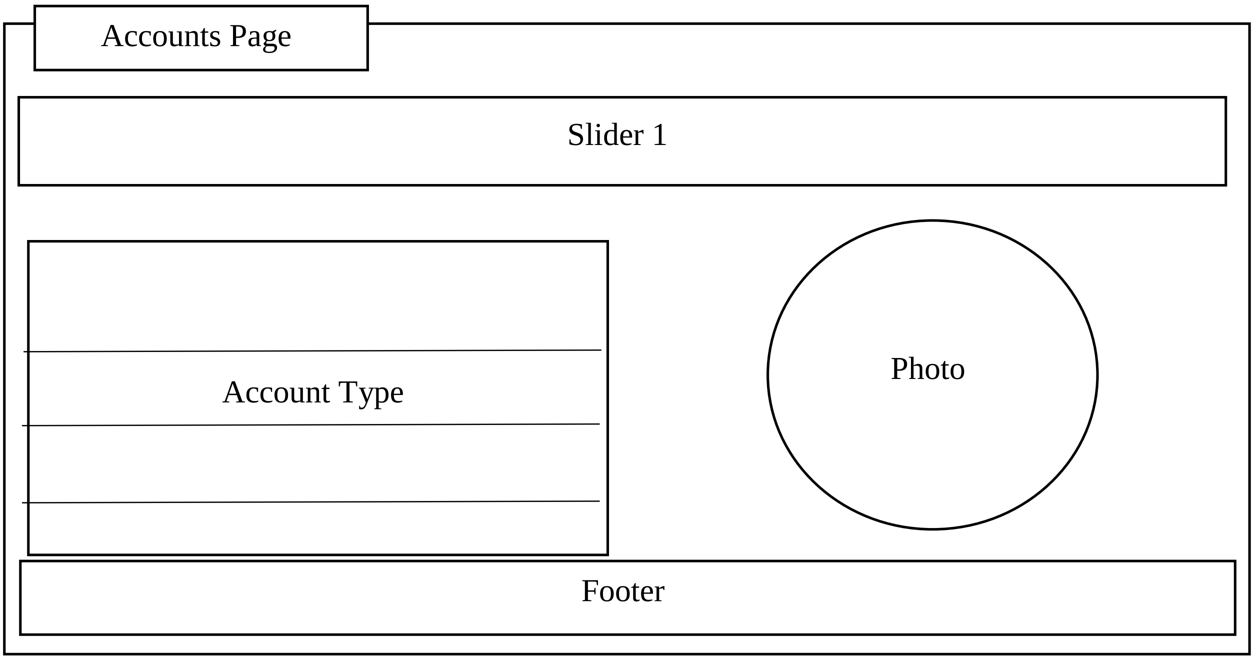


Figure2.3 Accounts Page

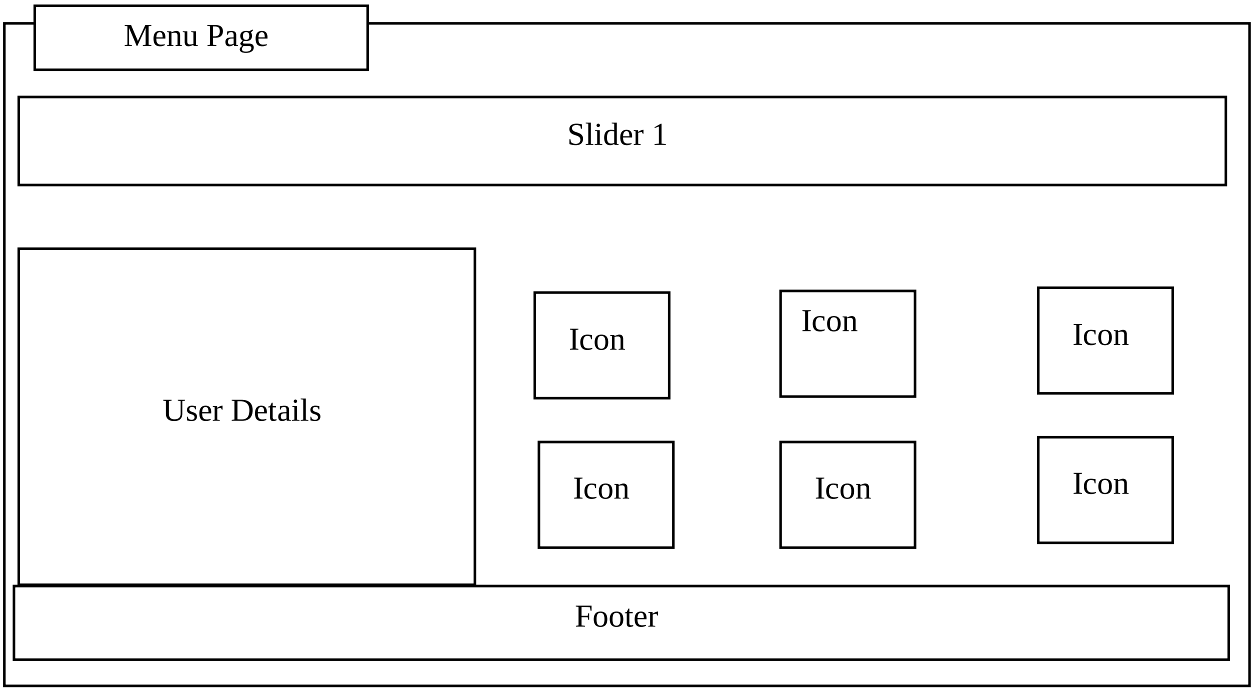


Figure2.4 Menu Page

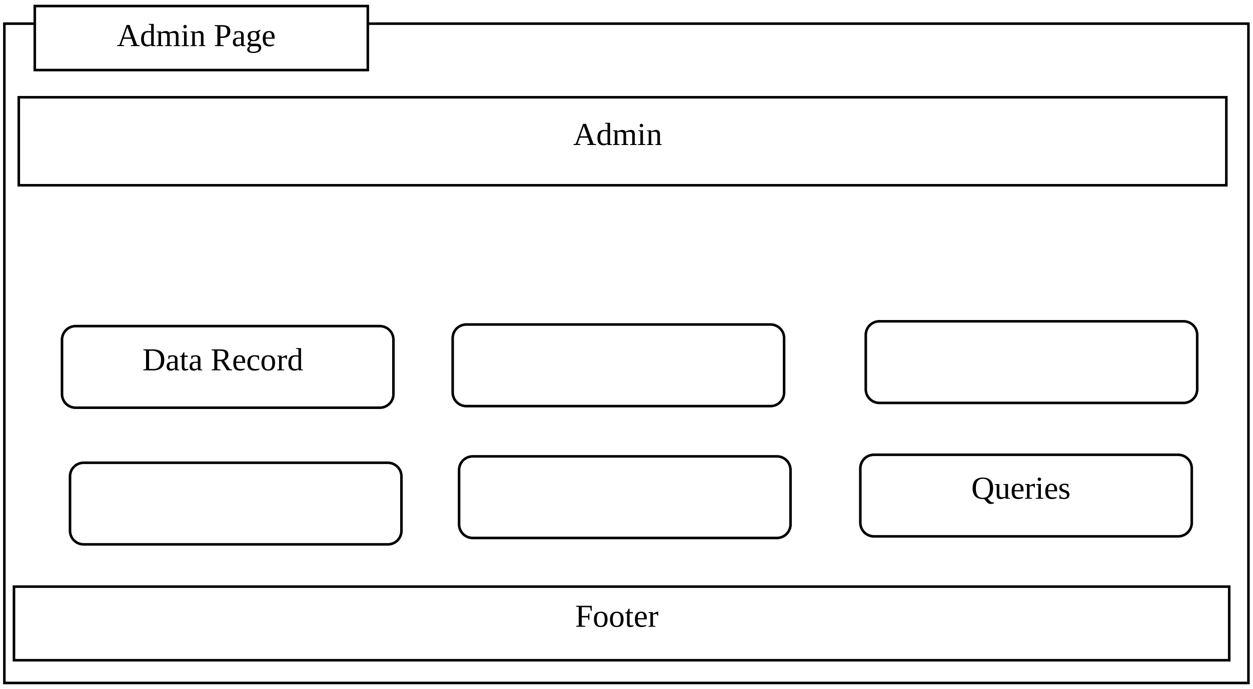


Figure2.5 Admin Page

2.2.3 Table Design

Table: Login_registration

COLUMN NAME	DATA TYPE	CONSTRAINTS
Name	Varchar(100)	Not Null
Email	Varchar(50)	Not Null
Account Number	Varchar(50)	Not Null
Branch location	Varchar(15)	Not Null
Username	Varchar(15)	Not Null
Password	Varchar(15)	Not Null
Confirm Password	Varchar(15)	Not Null

Table2.2 Login_ registration

Table: Login

COLUMN NAME	DATATYPE	DESCRIPTION
Username	Varchar(50)	Not Null
Password	Varchar(50)	Not null

Figure 2.3 login page

Table: Help_desk

COLUMN NAME	DATA TYPE	CONSTRAINTS
Name	Varchar(100)	Not Null
Contact	Number	Not Null
Email	Varchar(50)	Not Null
date	Date	Not Null
query	Varchar(50)	Not Null

Table 2.4 help_desk

2.3 Hardware Requirements

The Hardware requirements many serve as the basis for a contract for the implementation of the system and should, therefore, be a complete and consistent specification of the whole system.

Component Configuration

Component	Configuration
Monitor	15’’ LED
System	Pentium Dual Core
Processor	I5, Intel Core 8th Gen
RAM	4 GB
Hard Disk	120 GB and Above
System Type	64-bit operating system
Input Devices	Keyboard , Mouse

Table 2.5 Hardware Requirements

2.4 Software Requirements

Software requirement includes both definition and specification of requirements. It is a set of what the system should do rather than how it should do it. The software requirements provide a basis for creating the software requirements specification. It is useful in estimating cost,planning team activities, performing tasks throughout the development activity.

Specifications	Functional Requirements
Database	MYSQL
Programming Language	PYTHON
Operating System	Windows 7, 8 , and new Version
Tool	Pycharm , Anaconda

Table2.6 Software Requirements

PyCharm :

PyCharm is a hybrid-platform developed by JetBrains as an IDE for Python. It is commonly used for Python application development. Some of the unicorn organizations such as Twitter, Facebook, Amazon, and Pinterest use PyCharm as their Python IDE! It supports two versions: v2.x and v3.x.

PyCharm is cross-platform, with Windows, macOS and Linux versions. The Community Edition is released under the Apache License, and there is also Professional Edition with extra features – released under a proprietary license.

Coding assistance and analysis, with code completion, syntax and error highlighting, linter integration, and quick fixes

Project and code navigation: specialized project views, file structure views and quick jumping between files, classes, methods and usages

Python refactoring: includes rename, extract method, introduce variable, introduce constant, pull up, push down and others

Version control integration: unified user interface for Mercurial, Git, Subversion, Perforce and CVS with change lists and merge

Support for scientific tools like matplotlib, numpy and scipy [professional edition only·

It competes mainly with a number of other Python-oriented IDEs, including Eclipse's PyDev, and the more broadly focused Komodo IDE.

ANACONDA

Anaconda is a distribution of the Python and R programming languages for scientific computing (data science, machine learning applications, large-scale data processing, predictive analytics, etc.), that aims to simplify package management and deployment.

The distribution includes data-science packages suitable for Windows, Linux, and macOS. It is developed and maintained by Anaconda, Inc., which was founded by Peter Wang and Travis Oliphant in 2012. As an Anaconda, Inc. product, it is also known as Anaconda Distribution or Anaconda Individual Edition, while other products from the company are Anaconda Team Edition and Anaconda Enterprise Edition, both of which are not free.

Package versions in Anaconda are managed by the package management system *conda*.This package manager was spun out as a separate open-source package as it ended up being useful on its own and for other things than Python.

There is also a small, bootstrap version of Anaconda called Miniconda, which includes only conda, Python, the packages they depend on, and a small number of other packages.

Anaconda distribution comes with over 250 packages automatically installed, and over 7,500 additional open-source packages can be installed from PyPI as well as the conda package and virtual environment manager. It also includes a GUI, Anaconda Navigator,as a graphical alternative to the command line interface (CLI).

The big difference between conda and the pip package manager is in how package dependencies are managed, which is a significant challenge for Python data science and the reason conda exists.

In contrast, conda analyses the current environment including everything currently installed, and, together with any version limitations specified (e.g. the user may wish to have Tensorflow version 2,0 or higher), works out how to install a compatible set of dependencies, and shows a warning if this cannot be done.

Blockchain

A blockchain, originally block chain is a growing list of records, called blocks, that are linked using cryptography. Each block contains a cryptographic hash of the previous block,[6] a timestamp, and transaction data (generally represented as a Merkle tree). By design, a blockchain is resistant to modification of its data. This is because once recorded, the data in any given block cannot be altered retroactively without alteration of all subsequent blocks.

For use as a distributed ledger, a blockchain is typically managed by a peer-to-peer network collectively adhering to a protocol for inter-node communication and validating new blocks. Although blockchain records are not unalterable, blockchains may be considered secure by design and exemplify a distributed computing system with high Byzantine fault tolerance. The blockchain has been described as "an open, distributed ledger that can record transactions between two parties efficiently and in a verifiable and permanent way".

The identity of Satoshi Nakamoto remains unknown to date. The invention of the blockchain for bitcoin made it the first digital currency to solve the double-spending problem without the need of a trusted authority or central server.

Logically, a blockchain can be seen as consisting of several layers.

- infrastructure (hardware)
- networking (node discovery, information propagation and verification)
- consensus (proof of work, proof of stake)
- data (blocks, transactions)
- application (smart contracts/dApps, if applicable)

2.5 Conclusion

This chapter started with project plan, followed by database schema representation, respected diagrams and software & hardware requirements along with the descriptions. The overall design structure of the project is also portrayed. The following chapter focuses on the implementation phase.

CHAPTER 3

IMPLEMENTATION

3.0 Introduction

Implementation is the stage of the project when the theoretical design turned into a working system. Thus it can be considered to be the most critical stage in achieving a successful new system and in giving the user, confidence that the new system will work and be effective. The implementation stage involves careful planning, investigation of the existing system and its constraints on implementation, designing of methods to achieve the changeover and evaluation of changeover methods.

3.1 Method of solution related to problem

A web app is an application that the user does not download and instead accesses via a web browser over a network. Example web browsers include Google Chrome, Safari and Mozilla Firefox. While there are many banking applications without data security setting for the user. It does not contain any previous records for the better understanding of the user. The best solution is to fix the data lose problem by data security to the registered user’s mobile phone and to store the data records in the application. It also updated whenever needed. The queries raised by the user is also cleared by help desk simultaneously.

3.2 Accurate method of solution

The accurate method of solution links the objective with the implementation process. It includes how each module works its functionality. The modules are integrated properly to make communication of data to be done properly. The application works in a dynamical and also it fetch the result for the user in a fast manner. It is the solution for the manual system that is being computerized. There are some other methods were used to solve this solution or problem. The objectives of the project have been analysed and accomplished. Accurate method of solution meets the requirements and has done with it. The proposed system has the following modules Storing the data records of all the data permantely, can be updated and solves the complaints or queries which was raised by the user.

Fixing the reminder to the registered user’s mobile phone for updates and news.

3.2.1 XRP server Connection

The XRP server is a digital asset built for payments. It is the native digital asset on the XRP Ledger—an open-source, permissionless and decentralized blockchain technology that can settle transactions in 3-5 seconds. XRP can be sent directly without needing a central intermediary, making it a convenient instrument in bridging two different currencies quickly and efficiently. Faster, less costly and more scalable than any other digital asset, XRP and the XRP Ledger are used to power innovative technology across the payments space.

3.2.2 Message Verification

The Interactive messaging is fixed for reminding the users about the transaction done by the user. Users register their information upon desired application. The Interactive messaging works like the notification. It notifies a time before the transaction gets completed with verification. While registering, the pop-up message will pop in the client's phone. Automatically the message will be saved in the phone's storage.

3.2.3 Data Storage

The year's data records were stored in the application for the clear understanding of the user. It can be updated whenever needed. The help desk process for the user, it includes the user's complaint and FAQS about the Transaction. The storage will save all the transaction record in the block chain permantely and separating the session as the time and date with the transaction record , the separation of the block is done in the transaction done in the particular time and saves once's all the process have been completed .

3.2.4 Help Desk

The Helpdesk will store all the queries and problems of the user in a record were stored in the application for the clear understanding of the Banking . It can be updated the query details onces it is viewed whenever needed. The help desk process for the user, it includes the user's complaint and FAQS about the Transaction. Admin will rectify the user's complaints and FAQS for the users. The complaint is delivered to the admin in the form of pop-up message and official email. The response from the admin should be delivered within twenty-four hours of the complaint. The complaint and FAQS is fixed in separate roots in the admin's application.

3.3 Conclusion

Once the implementation phase is done, it is left to the developer or the testing team to check if each functionality of the application for which the code was developed and its works fine.

The various text are carried out are discussed in the next chapter.

CHAPTER 4

TESTING AND DOCUMENTATION

4.0 Introduction

Testing is one of the process by which one detects the defects in the software. It is considered as the final opportunity for developing team to defect and convert or rectify any defecting that may appear during the software development stage. Software testing is a process of testing a program with the explicit intention of review in software products and related documentation for completion, correction, reliability and maintainability.

Testing Objectives are,

- All field entries must work properly
- Ensure database is maintained with integrity and confidential
- The entry screen, messages and responses must be validated
- Validation of input has been done
- No duplicate entries should be allowed
- All links should take the user to the correct page .

4.1 Testing Strategies

The purpose of testing is to discover uncovered errors. Testing is the process of trying to discover every faults or weakness in the products. It provides a way to check the functionality of components, sub-assemblies. It is the process of exercising software with intent of ensuring that the software system meets its requirements and user exceptions and does not fail in an unacceptable manner. There are various types of test. Each type of test addresses specific testing requirements. Testing is the process in which the software tester has knowledge of the inner working structure and language of the software. The following are the types of testing that have been done to check and overcome the errors in the web application.

- Unit Testing
- Integration Testing
- Database Testing

4.1.1 Test Cases

A test case is an item which contains the following information

A set of test inputs. These are data items received from external source by the code under test. The external source can be hardware, software or human.

Execution conditions. These are conditions required for running the test, for examples, a certain state of database, or configuration of hardware device.

Expected output. These are the specified results to be produced by the code under test.

4.1.2 Test Plan

Test plan describes an overall strategy and a procedure that defines specific steps and the tests that will be conducted. An effective test plan and procedure will lead to the orderly construction of the software and the discovery of errors at each stage in the construction process.

4.2 Test Results

Testing strategy leads to test results. Actual testing will take place in this section. Test results describes an input, action or an Expected output, to determine if a feature of an application is working correctly and come up with an output testing phase. As mentioned in the previous section the test deliverables such as test cases, Project/Module name, test case description. Test input, expected output, actual output are contained in the test case. Every module was tested under certain conditions and errors were rectified. The following modules are tested and the actual results are furnished below.

- Registration
- Data Storage

4.2.1 Unit Testing

This type of testing is performed by developers before the setup is handed over to the testing team to formally execute the test cases. Unit testing is performed by the respective developers on the individual units of source code assigned areas. The developers use test data that is different from the test data of the quality assurance team. The goal of unit testing is to isolate each part of the program and show that individual parts are correct in terms of requirements and functionality.

Test outline

Case 1: Inter-Field dependencies

Case 1.1: Testing the login form, user email id and password input field, phone number and Account details.

Figure No 4.1 Outline Iteration 1

Table Name: Test results for unit testing

S. No	Module Name	Test Condition	Test Data/Input	Expected Result	Actual Result
1	Login Module	Click on the login button after entering email id and password	Enter invalid email id & password	Message prompts that “check username & password”	Message prompts that “check username & password”
2	Login Module	Click on the login button after entering email-id and password	Enter valid email id & password	Message prompts that “Successfully logged in”	Message prompts that “Successfully logged in”
3	Registration Module	Click on submit button after entering the details of user	Enter invalid mobile number	Message prompts that “Mobile number should be of 10 digits”	Message prompts that “Mobile number should be of 10 digits”

4	Registration Module	Click on submit button after entering the Mail id	Enter Invalid Email id	Message prompts that "Please check Mail id"	Message prompts that "Please check Mail id "
5	Registration Module	Click on submit button after entering the details of user	Enter valid Details	Message prompts that "Successfully Registered"	Message prompts that "Successfully Registered"

Table No 4.1 Test results for unit testing

Test Results

All the test cases mentioned above passed successfully. No defects are encountered.

4.2.2 Integration Testing

Integration testing is defined as the testing of combined parts of an application to determine if they function correctly. Integration testing can be done in two ways they are

Bottom-up integration: This testing begins with unit testing, followed by tests of progressively higher-level combinations of units called modules or builds.

Top-down integration: In this testing, the highest-level modules are tested first and progressively, lower-level modules are tested thereafter.

Test outline

Case 2: Interaction between modules of the application

Case 2.1: Check if login button is redirect to registration form

Case 2.2: Check if pressing the register button, the notification is giving the pop-up message with sound or not.

Case 2.3: check if all the data records are stored correctly without any duplicated data.

Case 2.4: Check if pressing previous records is redirects to corresponding record details page and displays the data records.

Case 2.5: Check if the help page form is redirecting to the particular page and rectifying the problem or not.

Figure No 4.2 Outline Iteration

Table Name: Test results for Integration testing

S.No	Module Name	Test Condition	Expected Result	Actual Result
1	Login page	Click on login button after entering valid input data	Navigate to the Alternate Page	Navigate to the Alternate Page
2	Account page	Account details must be displayed with all the updates .	Navigate to the Account task activity	Navigate to the Account task activity
3	Data Records	Click on display button for the details of previous Transaction	Previous details should be displayed.	Previous details should be displayed in the page.
4	Help Desk	Email is received from the user and should clear the solution.	The FAQS must be clarified by the admin and should be updated soon.	The FAQS must be clarified by the admin and should be updated soon.

Table No 4.2 Test results for Integration testing

Test Results

All the test cases mentioned above passed successfully. No defects are encountered.

4.2.3 Database Testing

Database testing involves the retrieved values from the database by the web or desktop application. Data in the User Interface should be matched as per the records are stored in the database.

Test outline

Case 3: Check whether the user is allowed to perform only those specific operations which are specified by the event requirements.

Case3.1: Check whether the registration and entered data are correct. Also, the data are fetched correctly.

Case 3.2: Check whether the details are retrieved correctly from the database.

Figure No 4.3 Outline Iteration 3

Table Name: Test results for Database testing

S.No	Module Name	Test Condition	Test Data/Input	Expected Result	Actual Result
1	Registration	Click the register button to save the details in the database	Personal and details are entered	The personal and details has been successfully registered	The personal and details has been successfully registered
2	Data Storage	Data records are stored and the information should be retrieved	All data records are entered	details has been successfully fetched and displayed	details has been successfully fetched and displayed

Table No 4.2 Test results for Integration testing