TRIBHUVAN UNIVERSITY
Institute Of Engineering
Pulchowk Campus
Department Of Electronics and Computer Engineering

A
Minor Project Report
on
"e-Banking"

Submitted
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Submitted
To

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Acknowledgement

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Abstract

As this is the era of science and technology, we hardly imagine our life without computer aided system. Keeping this view in mind, we have forwarded our minor project on ”e-Banking”. It is a project developed to create an online application on banking system for the ease and convenient of the customers. This application holds the administrator (server) part and user (client) part separately. Administrator provides the access of their client to their account through their unique user id and secret password. Our project is a web based application.

Here, we provided the user to register online after he has opened an account in the bank. The client, can then do banking transactions like, fund transfer, see account details, statement of the transactions he has done along with his mobile recharge. Since our project is a web based, we have used powerful scripting language, JSP along with HTML. We used IDE Netbeans 5.5 as a platform to develop this project.

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Introduction

Internet, in today's world can be considered as the ocean of information. All the curiosities of human mind are easily solved by the internet. So, with the passage of time, many achievements have been made in this sector and the surfers' of the net are provided optimum services. One of such services is the Online Banking Service. With the increase in the popularity of the internet, more and more banks are providing the online banking facilities. On keeping the popularity of this service in mind, we build our project on online banking.

Since our project is a web based, the visitor can view different information about the bank made accessible to them but cannot login the database till he has opened an account in the bank and has registered online to get his login id and the password. As the customer (client) opens his account in the bank with some fixed amount of opening balance, he gets his unique account number. Then he has to consult the concerned personality (administrator) in the bank to deposit or withdraw his money. With this account number provided by the administrator, the account holder can register for the online services. For this, he has to login to view his fund details, transfer his fund, can see the statement of the transactions either in daily basis or in periodic basis and can do his mobile recharge too. Besides, the client can change his password if he wishes to.

The administrator performs various operations viz., update records such as interest, name of board of directors, transactions like opening account, closing account, withdraw, deposit of amount, inserting recharge number. There is a provision to calculate the interest too. He too can view the customers report along with the bank report.

For the quick view, we have used the database system to store the information about the customers relating to their personal profile, account balance, to see the status of individual activity and the provision to change the password for the security. Different tables have been created to store the different information of the customers and also to reflect their transactions.

Since this project is mainly focused on the online transaction in any e-banking system, we have provided here unavoidable features of such system and has used SHA-I algorithm for the password encryption. We provided the provision for changing password. Finally, we hope that the project will be fruitful to any interested readers/programmers to study about the online system and its application.

Short Literature Review

The goal of this project is to build a network based banking system, in which all costumers (clients) are connected to the administrator (server) through the network. So, client can access a central database though the network. There is a single common database in the central branch, which contains all the information about the customers from all branches.

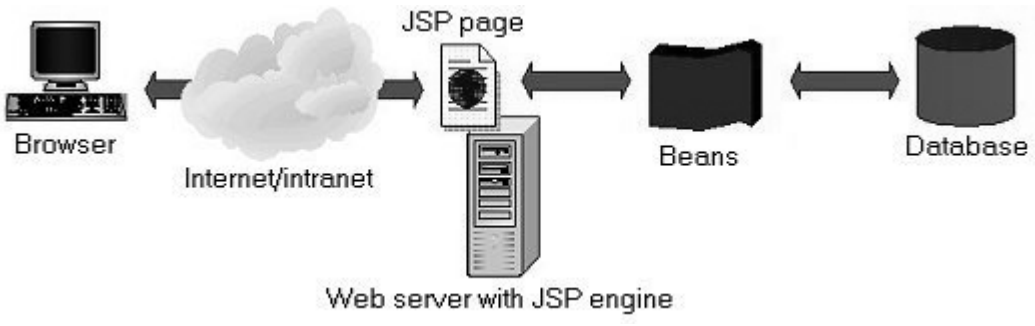
For this project, we choose a platform independent programming language, JAVA, Scripting language JSP. JAVA is the most popular Object Oriented Programming language especially for the network programming. So we choose this programming language as our application development tool.

A. Java Server Page

Java Server Page (JSP) is a technology defined by Sun Microsystems to create dynamic content on the web. Unlike the static HTML page the JSP make the server side application more flexible. They are HTML documents that are interleaved with Java, which provides the dynamic content. JSP is a server side application; they accept a request and generate the response. Generally, the request is made from web client, and the response is the generated HTML document that gets sent back to the web client. Because, JSP is a server side application they have access to the resources on the server, such as servlets, Java Beans and Databases.

Main reasons to use JSP:

- Multi platform
- Component reuse by using JavaBeans and EJB.
- Advantages of Java.



B. MySQL:

MySQL is a relational database system, which basically means that it can store bits of information in separate areas and link those areas together. MySQL helps us to keep the records into tables or areas of pertinent information. In nonrelational database systems, all the information is stored in one big area, which makes it much more difficult and cumbersome to sort and extract only the data we want. In MySQL, each table consists of separate fields, which represent each bit of information.

In this, we first create tables based on what type of information we want to store in them. The separate tables of MySQL are then linked together with some common denominator, where the values of the common field are the same.

C. XAMPP

XAMPP is a state of the integrated and fully automated installer that turns PC into dynamic web server for the development, testing and production purposes. XAMPP is one of the leading installer in the market.

D. JAVA

Java technology is a both programming language and a platform. Java is a new Language, but it draws on many years of programming experience with the other language in its choice of features. Java is used mostly because programs made in java can be run in any platforms. A language should be compact. And here, Java is fast enough, especially for interactive, network based applications where the application is often ideal, waiting for the user to do something or waiting for data from the network.

The java is a visual programming tool. We have used MYSQL for handling database since it is free and easy to implement.

APPLICATION DEVELOPMENT ENVIRONMENT

1. JSP for application programming
2. MYSQL for database management system
3. IDE Netbeans 5.5 for coding platform

Security

In any banking system, security becomes the most essential part, so to make our application secured, we implemented various security options. Some of them are listed below.

1. **Provision of changing password:**

   Whenever the user becomes doubtful about the security, he has privilege to change his password. Due to this, he can have secure password along with his unique user id.

2. **Encryption algorithm:**

   Here whenever user enters his secret password while registering for online, the password is first encrypted using encryption algorithm, then inserted into the database. For this we have used SHA-1 algorithm.

   a. **SHA-1 algorithm:**

      SHA-1 stands for Secure Hash Algorithm and are five cryptographic hash functions designed by the National Security Agency (NSA) and published by the NIST as a U.S. Federal Information Processing Standard. Hash algorithms compute a fixed-length digital representation (known as a message digest) of an input data sequence (the message) of any length. They are called "secure" when (in the words of the standard), "it is computationally infeasible to:

      i. Find a message that corresponds to a given message digest, or
      ii. Find two different messages that produce that same message digest.

Any change to a message will, with a very high probability, results in a different message digest."

The five algorithms are denoted SHA-1, SHA-224, SHA-256, SHA-384, and SHA-512. The latter four variants are sometimes collectively referred to as SHA-2. SHA-1 produces a message digest that is 160 bits long; the numbers in the other four algorithms' names denote the bit length of the digest they produce.

SHA-1 is employed in several widely used security applications and protocols, including TLS and SSL, PGP, SSH, S/MIME, and IPsec. It was considered to be the successor to MD5, an earlier, widely-used hash function.

The security of SHA-1 has been somewhat compromised by cryptography researchers. Although no attacks have yet been reported on the SHA-2 variants, they are algorithmically similar to SHA-1 and so efforts are underway to develop improved alternative hashing algorithms.

3. HTTPS protocol:

HTTPS (Hypertext Transfer Protocol over Secure Socket Layer) is a URI scheme used to indicate a secure HTTP connection. It is syntactically identical to the `http://` scheme normally used for accessing resources using HTTP. Using an `https:` URL indicates that HTTP is to be used, but with a different default TCP port (443) and an additional encryption/authentication layer between the HTTP and TCP. This system was designed by Netscape Communications Corporation to provide authentication and encrypted communication and is widely used on the World Wide Web for security-sensitive communication such as payment transactions and corporate logons.

To prepare a web-server for accepting https connections the administrator must create a public key certificate for the web-server. These certificates can be created for Unix based servers with tool(s) such as OpenSSL's `ssl-ca` or SuSE's `gensslcert`. This certificate must be signed by a certificate authority of one form or another, which certifies that the certificate holder is indeed the entity it claims to be. Web browsers are generally distributed with the signing certificates of major certificate authorities, so that they can verify certificates signed by them.

Organizations may also run their own certificate authority, particularly if they are responsible for setting up browsers to access their own sites (for example, sites on a company intranet), as they can trivially add their own signing certificate to those shipped with the browser.

Some sites, especially those operated by hobbyists, use self-signed certificates on public sites. Using these provides protection against simple eavesdropping, but unlike a well-known certificate, preventing a man-in-the-middle attack with a self-signed certificate requires the site to make available some other secure method of verifying the certificate.

The system can also be used for client authentication, in order to restrict access to a Web server to only authorized users. For this, typically the site administrator creates certificates for each user which are loaded into their browser. These normally contain the name and e-mail address of the authorized user, and are automatically checked by the server on each reconnect to verify the user's identity, potentially without ever entering a password.

Problem Statement

"e-Banking" can now be considered as a means of doing banking transactions online in an efficient and convenient way. But, with the absence of such facilities there may arise many problems in our society and to its people. Some of these problems are listed below:

- Not every bank in our country of today has become able to provide 24 hours banking service.
- It becomes very difficult to provide facility of payment to others through bank without visiting the bank.
- It is not feasible to view our account information until and unless we waste some of our valuable time going to bank.
- There may be possibility that any branch of our bank may not locate at our desired location.
- Going to bank and standing in a queue even for a small job such as getting in formations of the bank, our account transactions and transferring amount, is a complete waste of time.

Objectives

The main goal of this project can be summarized as below:

Course Objectives

- To develop the knowledge on JAVA, JSP.
- To develop professional carrier and skills of the group work.
- All the data and system will be arranged in best possible manner.

Provide a representation of information in clear and reliable forms to understand.

Specific Objectives

- To provide 24 hours banking services.
- To provide facility of online payment capabilities.
- To provide security system ie., password encryption and changing password.
- To provide fund transfer facilities.
- To provide facilities of viewing his/her account information.
- To provide internet banking service.
- To provide geographically unrestricted facilities.
- To provide efficient facilities (i.e. no need to reach the bank, stand in a queue and waste the valuable time).
- Provide the facility of mobile recharge.

Proposed System

Description

1.1 Description of server model:

Administrator and operator login is available on local area network (LAN) inside the bank only while client login is available in internet. The login server (client and operator server) gives access to the database to valid users by making database connection. This server stores both the browser session_id and database session_id. Then the server post the service page to the client or the operator and pass the connection and session to the database server. Through this connection, the database servers interact with the database. The database server is a set of number of serves. They are administrator server, account opening server, deposit server, money withdraw server, money transfer server and so on. Administrator server creates user and grant to or revoked privilege from the user. Account opening server inserts inventory profile in the database and gives a unique account number to the user. The deposit server, deposit money and so on. The server model is illustrated in fig 1.1.

1.2 Description of client model:

A client fills account opening form to open a new account. The software generates an account number and store client's inventory profile in this account and sends this account number to the client. When a client requests for with draw amount, a success message is sent to the client, if there is enough money, otherwise "insufficient fund" message is sent to the client. Similar is for fund transfer. The client model is illustrated in figure 1.2.

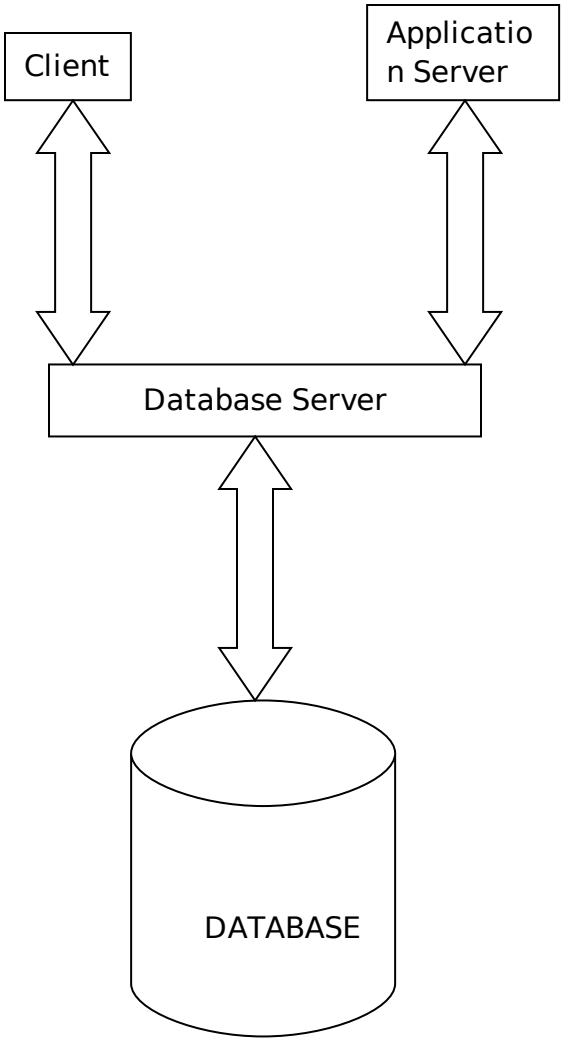


Figure: 1.2 Server model

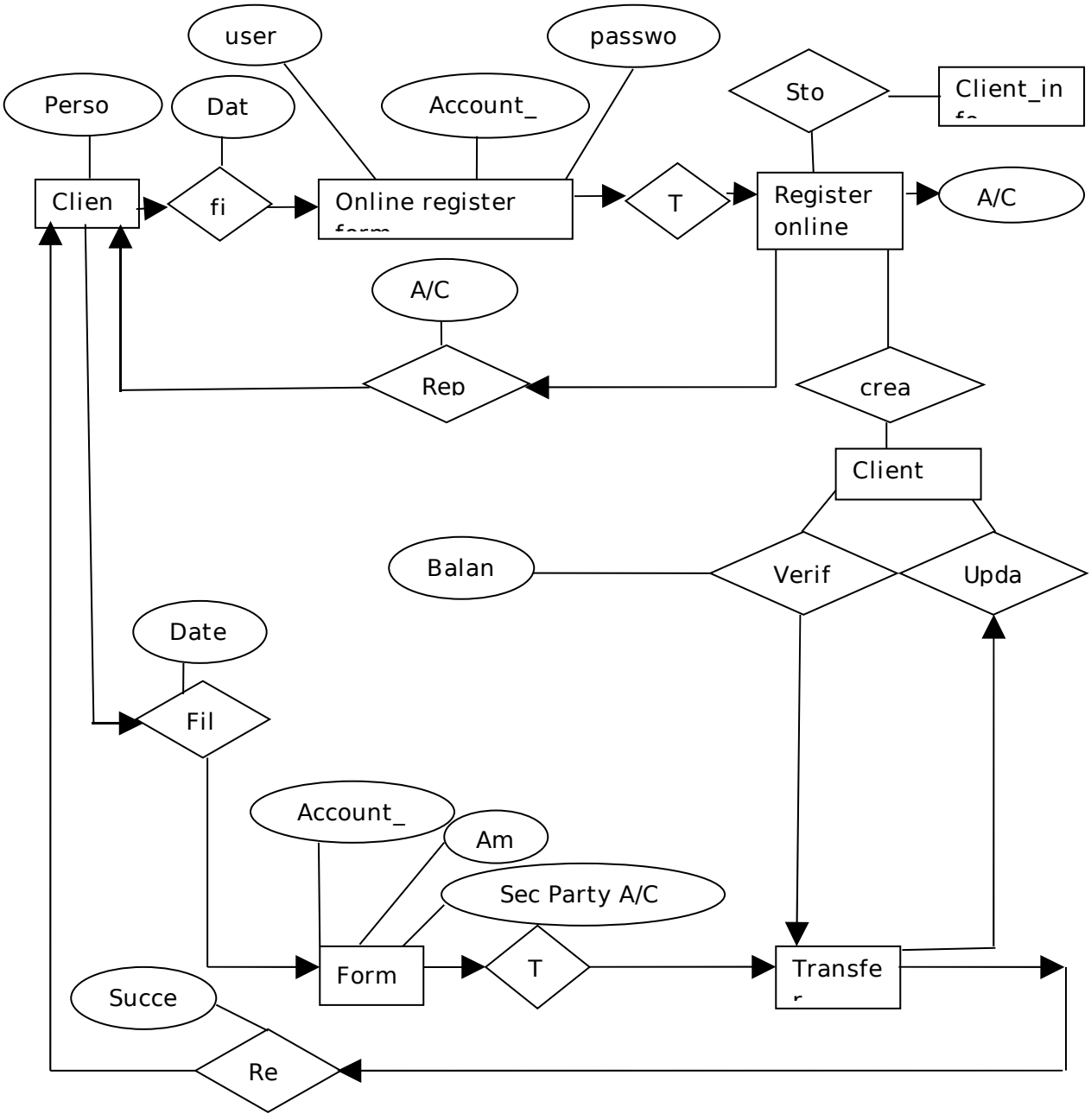

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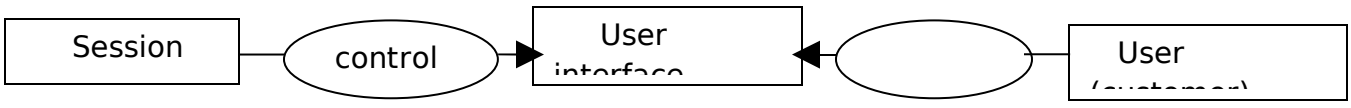
Figure: 1.2 Client Model

System Block diagram



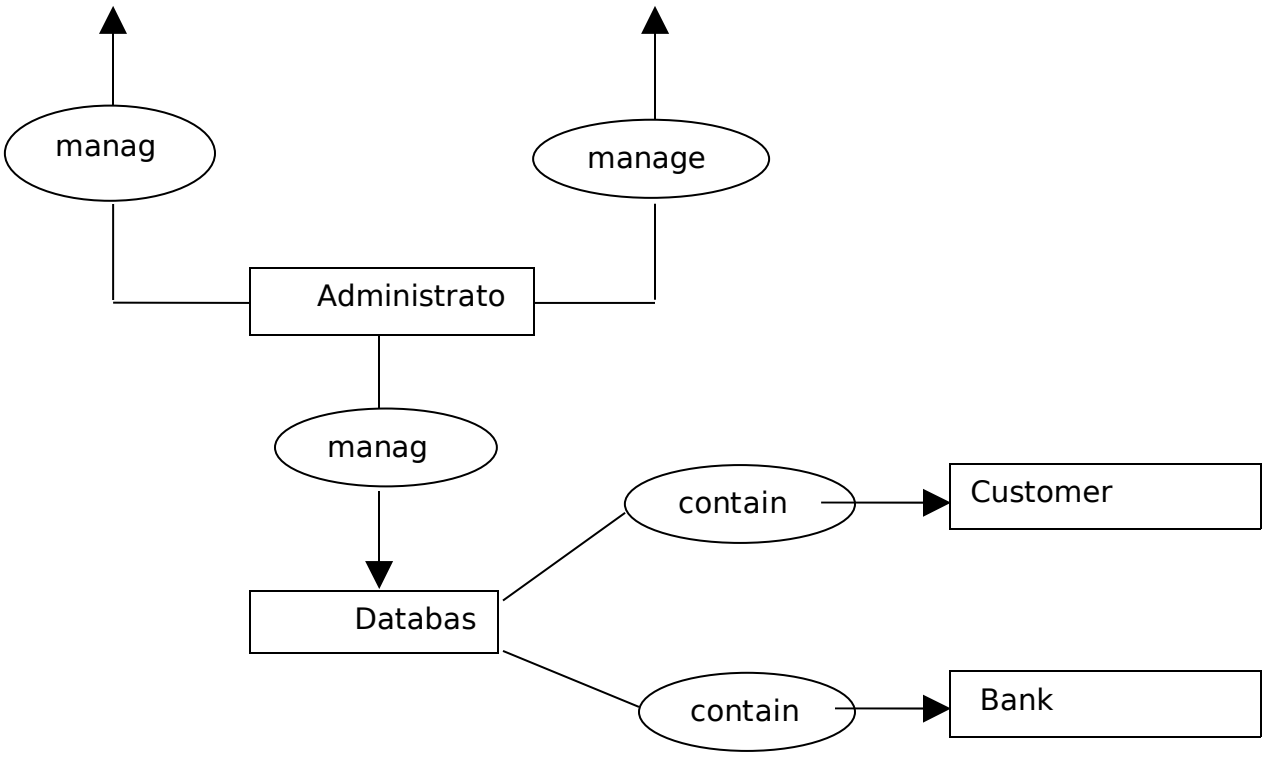


Figure: 1.3 Internal Structure

Methodology

To achieve our goal, we adopted the following methodology:

1**. Study of existing System:** There are various E-BANKING systems available in various fields. To achieve our goal, we studied them and find out their features and limitations so that we became able to use or eliminate in our project.

2. **Requirement Analysis:** After studying the existing system, the next step is to list out all the requirements.

3. **Problem solving:** After analyzing the requirements, we faced different problem which hindered the fulfilling of our project goals. Hence, the next step was to find the proper solution to those problems.

4**. Design:** Here we designed a prototype of our system that met our requirements.

5. **Coding:** We developed the prototype into an application package. For this, we chose the programming language, JAVA, scripting language, JSP.

6. **Documentation:** Documentation is essential for the future reference of this project. So we kept record of what we have done and what to do in future.

7. **Testing:** The developed Software should run in different environments. Therefore it is necessary to test the application under different conditions and must be debugged (if necessary) before it can be implemented in real time. So, we tested our application program.

8. **Implementation:** The application (software) can be implemented only after testing.

ER-Diagram

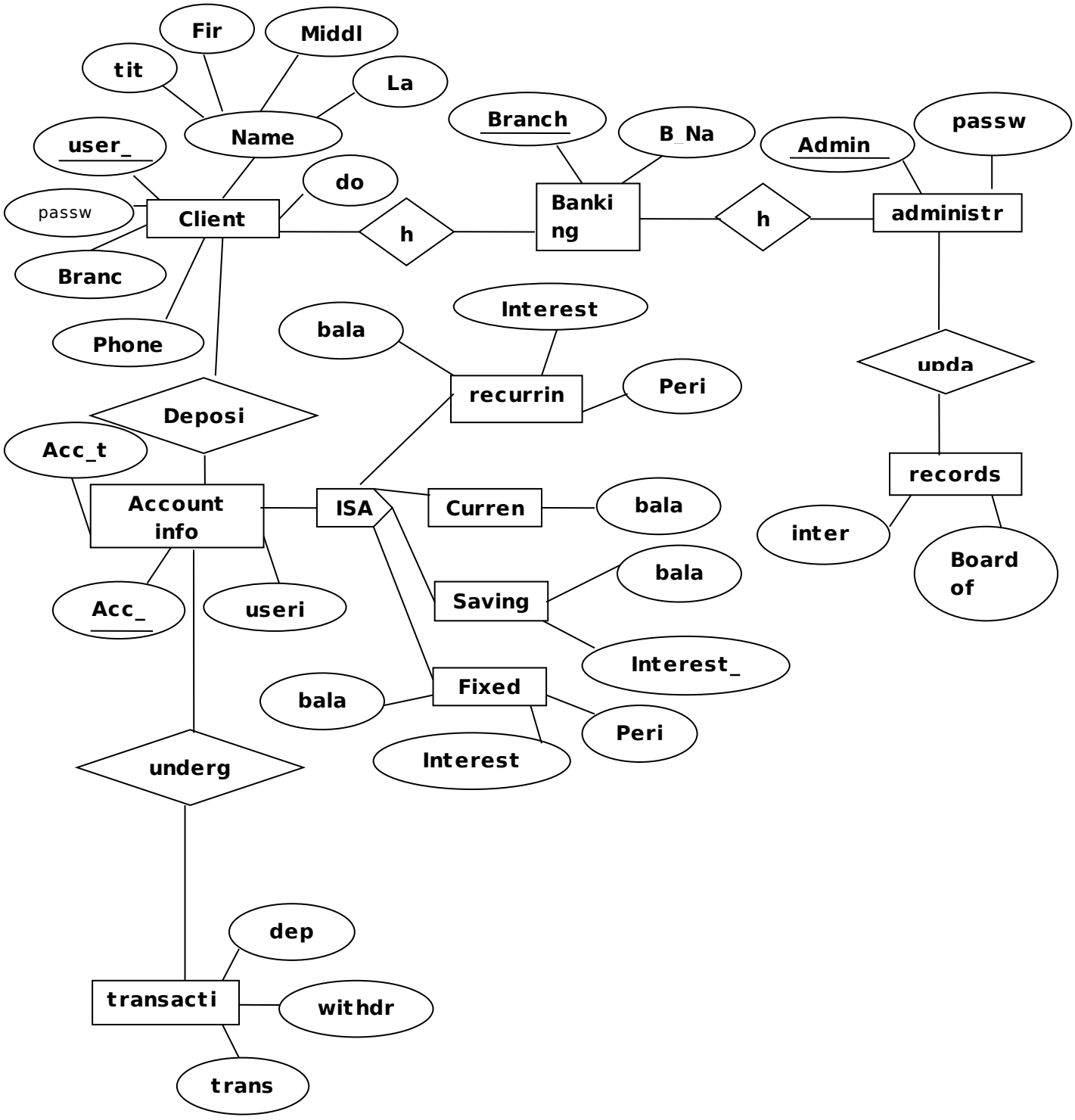

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Figure: ER-Diagram

Expected Results

- Since in this Project, users can create an account, view an account states, balance transfer from one account to another account, it fulfills the user's requirements of Banking. Users need not rush to the bank and stand in a queue for hours by wasting time. To use this Software instructions will be sufficient .So this Project is operationally feasible.

- Clients can view banking transactions through net and cyber nearby. Hence it saves money and also time required for transportation. So it is economically feasible.

- After the completion of this project, we, the programmer would get sufficient practical knowledge to develop a Software in accordance to the fulfillment of our requirements and mainly we would be

familiar with the Database and Networking.

- Since we are doing this in a group, we will learn how to work in a group by dividing the works.

Scope of the project

We have tried our best to facilitate our customer by including much more advanced ideas. Thus the main scope of the project is obviously in any bank where the consumer can be well assured about following point:

- Convenience: Unlike bank at our corner, online banking sites never close; they are available 24 hours a day, seven days a week and they are only a mouse click away.
- Ubiquity: If we are out of state when money problem arises, we can log on instantly to our online bank and take care of business.
- Transaction speed: Online bank sites generally execute and confirm transactions at or quicker rate.

- Efficiency: We can access and manage all of our bank accounts, including CDs even securities, from one secure site.

The facilities planned to be provided in this project are:

- To create a new account
- See account details
- Perform banking transactions like deposit, withdraw, transfer amount and print them in hard copy.
- Calculate interest rate
- Update accounts

Conclusion

During the project development, we understood the visual programming like JAVA and other different languages. We selected the project, analyze and code the project and model the project. We achieved the objectives of this subject. What we expected is what we get.

During the project work, we got familiarized with team work and also with the coding and designing the application program for making professional software that will compete in the real professional world.

The bugs and errors were handled through the suggestions of teachers and friends and we got the concept to handle the problems occurred during the development of the project. Lastly we want to thank our teachers for their suggestions and help during the project.

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Output

Userinterface

Client side

Manager side

Updates

Transactions