

Chapter 1

**INTRODUCTION
OF
ONLINE BANKING**

1. Introduction

Internet Banking has gained increasing attention from bankers and other financial services industry participants, the business press, regulators, and law makers, all around the world.

“Internet bank” means a bank offering the ability to transact business with the bank over the Internet to its clients.

1.2 Internet Banking ,Online Banking ,E Banking, 3 terms 1 Meaning:

Definitions and Background

Internet banking means the use of the Internet as a remote delivery channel for banking services such as opening an account or transferring funds among different accounts, and new banking services, such as electronic bill presentment and payment (allowing customers to receive and pay bills on a bank’s Web site).

1.3 Differences Between Online Banking and Online Bank

We must know the difference between online banking and online bank as well some important terms.

1.3.1 Online Banking

Online Banking is an Internet-based service that provides you a safe and convenient way to do your banking. With Online Banking, you can view your account balances, transfer funds, pay bills, stop payments, add notifications , send service requests to the bank and more.

1.3.2 Online Bank

Online bank on other hand means a bank which isn’t physically located but is on the whole on web. These banks are also called virtual banks.

1.4 Ways Of Banking

Internet banking can be offered in two main ways. A bank which exists physically with physical offices can develop a Web site and offer Internet banking facility to its clients as an addition to its traditional delivery channels. The other way is to establish a “virtual bank,” “branchless,” or “Internet-only” bank. The computer server of a virtual bank may be housed in an office that serves as the legal address of such a bank .Virtual banks may offer their clients the ability to make deposits and withdraw funds via ATMs.

1.5 Key Internet banking services

Most transactional banks offer following services:

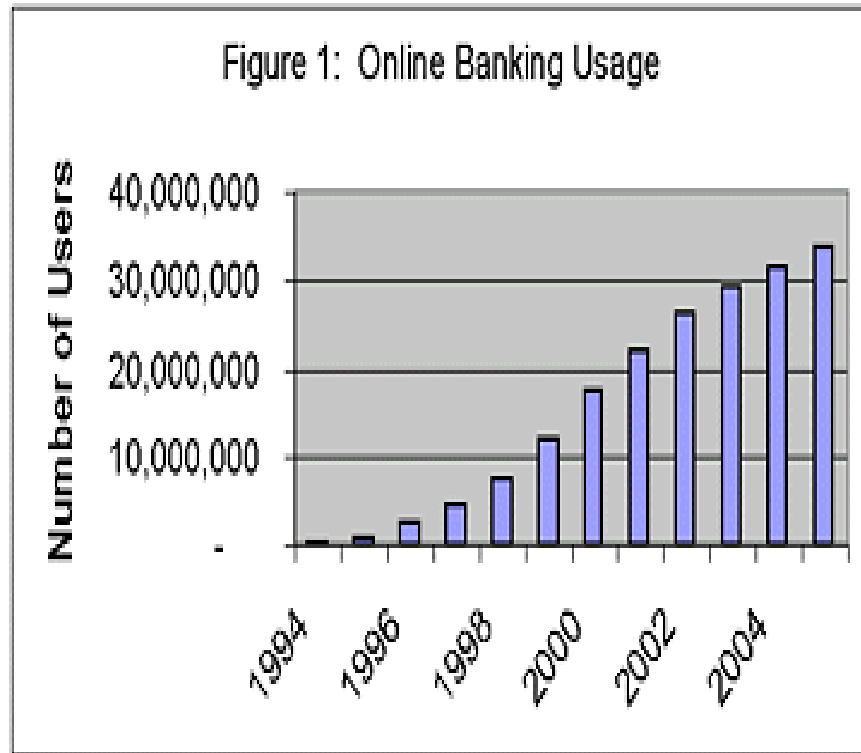
- Balance Inquiry
- Credit application
- Loan application
- New Account application
- Bill Payments
- Fund Transfer

1.6 The determinants of Internet banking

Reviewers say the following about an online banking account:

- **An online bank and its corporate parent can differ on rates.** Since the rates are usually higher, so it pays to check out e-savings accounts at your bank.
- **At online banks deposits can take longer.** Direct deposits and bank transfers are faster. Because you mail deposit checks, so you have to account for mailing time, plus up to five days for a check to clear generally.
- **Phishing Scams.** In phishing, you're asked to reveal more about your banking account by clicking a link. If you do so, you're open to having your assets stolen by revealing account numbers or passwords.

Online Banking Usage



[Source: Online Banking Report, January 1998]

Fig 1.1

1.7 Internet banking business models

Internet banking models are evolving in a wide spectrum. These models differ on the question that who will establish the relationship to the end customer such as account opening, deposit taking, lending etc., the Bank or the Non-Bank/Telecommunication Company.

1.7.1 Categories Of Internet Banking Model

Models of Internet banking are of three categories

- Bank Focused,
- Bank-Led
- Non bank-Led.

1.7.1.1 Bank-focused model

When a traditional bank uses non-traditional low-cost delivery channels to provide banking services to its existing customers, the bank-focused model emerges. Examples are automatic teller machines (ATMs), internet banking or mobile phone banking to provide certain selected banking services to banks' clients.

1.7.1.2 Bank-led model

In bank-led model the customer conducts financial transactions through mobile phone instead of at bank branches .This model will increase the financial services outreach by using a different delivery channel (mobile phones), a different trade partner (telco / chain store) having experience and target market distinct from traditional banks, and may be significantly cheaper than the bank-based alternatives.

1.7.1.3 Non-bank-led model

The non-bank-led model is where a bank does not come into the picture and the non-bank (e.g telco) performs all the functions.

1.8 Challenges for a Internet Banking Solution

Key challenges in developing a sophisticated an Internet banking application are :

1.8.1 Interoperability

Internet banking lacks common technology standards .Many protocols are being used for online banking e.g. HTML, WAP, SOAP, XML. Vendor should develop a banking application that can connect multiple banks. The application would be required to support multiple protocols or use a common and widely acceptable set of protocols for data exchange. Interoperability depends on the banks themselves, where java enabled applications provides better security, easy to use and offer development of complex transactions similar to that of internet banking.

1.8.2 Security

Internet banking application developers, network service providers and the bank's IT department should address together the two complicated challenges, security of the financial transaction and financial information transmission over the air. The following aspects need to be addressed to offer a secure infrastructure for financial transaction over wired network:

1. Physical security of the hand-held device is important if the bank is offering smart-card based security.
2. Security of the thick-client application running on the device. In case the device is stolen, the hacker should require ID/Password to access the application.
3. Bank's customer, User ID / Password authentication
4. Data being transmitted over the air should be encrypted.
5. Offline data stored in the device should be encrypted.

1.8.3 Scalability & Reliability

Scaling-up the Internet banking infrastructure to handle exponential growth of the customer base is another challenge for the banks. With Internet banking, banks need to ensure that the systems are up and running in a true 24 x 7 fashion, since the customer may be sitting anywhere, at anytime in the world. Customer's expectations from the solution will increase, as they will find Internet banking more and more useful. Customer confidence might be lost if banks are not able to meet the reliability expectations.

1.8.4 Application distribution

It would be impractical to expect customers to regularly visit banks or connect to a web site for regular upgrade of their banking application. The banking application should itself check the upgrades and updates and download necessary patches. However, there could be many issues to implement this approach such as upgrade / synchronization of other dependent components.

1.8.5 Personalization

It would be expected from the banking application to support personalization such as:

1. Preferred Language
2. Date / Time format
3. Amount format
4. Default transactions

1.9 Key Terms In Internet Banking

1.9.1 EDC

“An electronic delivery channel is the channel in which delivery of a banking product is made through an electronic medium. The most popular forms of EDCs in banks are ATMs, internet banking, card payments, mobile banking, touch-screen information, SMS and mobile banking, e-mail banking etc.

1.9.2 ATMs

An **automated teller machine (ATM)** is a computerized telecommunications device that provides the customers of a financial institution with access to financial transactions in a public space without the need for a human clerk or bank teller. On most modern ATMs, the customer is identified by inserting a plastic ATM card with a magnetic stripe or a plastic smartcard with a chip, that contains a unique card number and some security information, such as an expiration date. Security is provided by the customer entering a personal identification number (PIN).

1.9.3 A credit card is a system of payment named after the small plastic card issued to users of the system. A credit card is different from a debit card in that it does not remove money from the user's account after every transaction. In the case of credit cards, the issuer lends money to the consumer to be paid to the merchant. It is also different from a charge card, which requires the balance to be paid in full each month. In contrast, a credit card allows the consumer to 'revolve' their balance, at the cost of having interest charged.

1.9.4 A debit card is a plastic card which provides an alternative payment method to cash when making purchases. Physically the card is like a credit card; however, its functionality is more similar to writing a cheque as the funds are withdrawn directly from either the cardholder's bank account or from the remaining balance on a gift card. In some countries the debit card is multipurpose, acting as the ATM card for withdrawing cash and as a check guarantee card.

Figure 1.2 ATM



Fig 1.4



Fig 1.5 Smart Card

1.9.5 Smart card

Smart card used for health insurance in France.

A **smart card**, **chip card**, or **integrated circuit card (ICC)**, is defined as any pocket-sized card with embedded integrated circuits which can process information. This implies that it can receive input which is processed - by way of the ICC applications - and delivered as an output. There are two broad categories of ICCs. Memory cards contain only non-volatile memory storage components, and perhaps some specific security logic. Microprocessor cards contain volatile memory and microprocessor components. The card is made of plastic, generally PVC, but sometimes ABS. The card may embed a hologram to avoid counterfeiting.

1.9.6 Email as a secure means of communication has not come to stay in a pervasive manner in the country. In most of the banks, only routine correspondence (not involving financial nature or approvals) is being done through email.

1.9.7 Loan

A **loan** is a type of debt. Like all debt instruments, a loan entails the redistribution of financial assets over time, between the lender and the borrower.

The borrower initially receives an amount of money from the lender, which they pay back, usually but not always in regular installments, to the lender. This service is generally provided at a cost, referred to as interest on the debt. A borrower may be subject to certain restrictions known as loan covenants under the terms of the loan.

Acting as a provider of loans is one of the principal tasks for financial institutions. For other institutions, issuing of debt contracts such as bonds is a typical source of funding. Bank loans and credit are one way to increase the money supply.”[1.1]

1.10 Summary and Conclusions

“Internet banks depend more on non interest income and less on deposits for funding than do non-Internet banks. Internet banks have better accounting efficiency ratios and higher returns on equity than non-Internet banks.

There is no doubt that the revolutionary developments in information and communications technology will continue to transform the banking and financial industry.

Internet banking, despite the uncertainties about its future, will be an important part of this transformation” [1.2]

PROJECT OVER VIEW

1.11 Project Overview

Gone are the days when the word 'bank' would remind one of a building with brick and mortar architecture with human beings sitting in the counters and the subordinate staff moving about here and there with a cheque and ledger or register in their hands. Nowadays, when we say bank we do not recollect any building, but probably an ATM, a computer or just cash or just nothing but visualize a debit or credit to our account. There are occasions when we do not go the bank at all and 'talk to any human being' as part of a banking service.

This project is a web application which performs online banking. In this project we will see the term online banking synonymous to internet or E banking.

This project is not about developing a virtual bank which physically exists no where ,since this is beyond the scope of the project ,which could (virtual bank) can provide all the banking services including account transfer, account addition, account deletion , account opening ,account modification, providing different types of accounts such as current savings, certificates loan, car financing ,house financing, pension account, bill payment facility ,viewing and editing your bill payment history, adding email alerts which send alerts to your email account for new information.

This project provides basic banking facility of transactions between customer and bank, thus fulfilling the need of banking though internet and thus explaining how banking transactions takes place over internet along with some extra services of live chat and utilizing financial calculators and currency converters. The project also provides a basic forum over which the customer can write his views and interact with other members in the forum.

1.12 Key Points Of The Project

Through this website of internet banking, the customer can easily:

- Login in a secure environment
- View his accounts
- Add alerts /notifications
- Stop payment on checks
- Apply for loan
- Apply for credit cards
- Apply for ATM cards
- Utilize loan calculator
- Utilize simple calculator
- Utilize currency converter
- Utilize currency finder
- Email the bank
- Chat with the operator
- SMS anywhere
- View calendar
- Join the discussion forum
- Email Anywhere
- View Time
- View Events

CHAPTER 2

THE PROPOSED SYSTEM

Web based applications evolve from static, content directed information to dynamic user-directed applications. To accomplish this, it is necessary to develop a framework that encompasses an effective process model, populated by the activities and tasks. Process model consists of

- Formulation (requirement specification)
- Analysis (requirement analysis)

2.1 Formulation (Requirement Specification)

Formulation is an activity that identifies the goals and objectives of the application and establishes the scope. It focuses on what, why and who's of the project. A set of questions should be answered at the beginning of formulation step:

- Why is the application needed?
- Who will use the application?
- Who will service the application?
- What is so different about application?
- Who else is using such applications?

2.1.1 Why Is The Application Needed?

This application of Online Banking is developed to provide the basic functionality of banking through a website. This website demonstrates how banking services and financial transactions between the customer (sitting anywhere and at any time) and the bank take place through the internet technology.

2.1.2 Who will use the application?

This application can be accessed by anyone having account in the bank, an email address and password.

2.1.3 Who will service the application?

The website will be serviced by the bank providing banking services online.

2.1.4 What is so different about application?

Most of the banking websites provide financial transactions only. This website provides bank transactions between customer and bank database as well as live chatting option with the bank's operator for live help. The website also provides a discussion forum for the members to add their comments or join the discussion. Other than that calculators, news scroller, calendar and currency converters have been added to the website

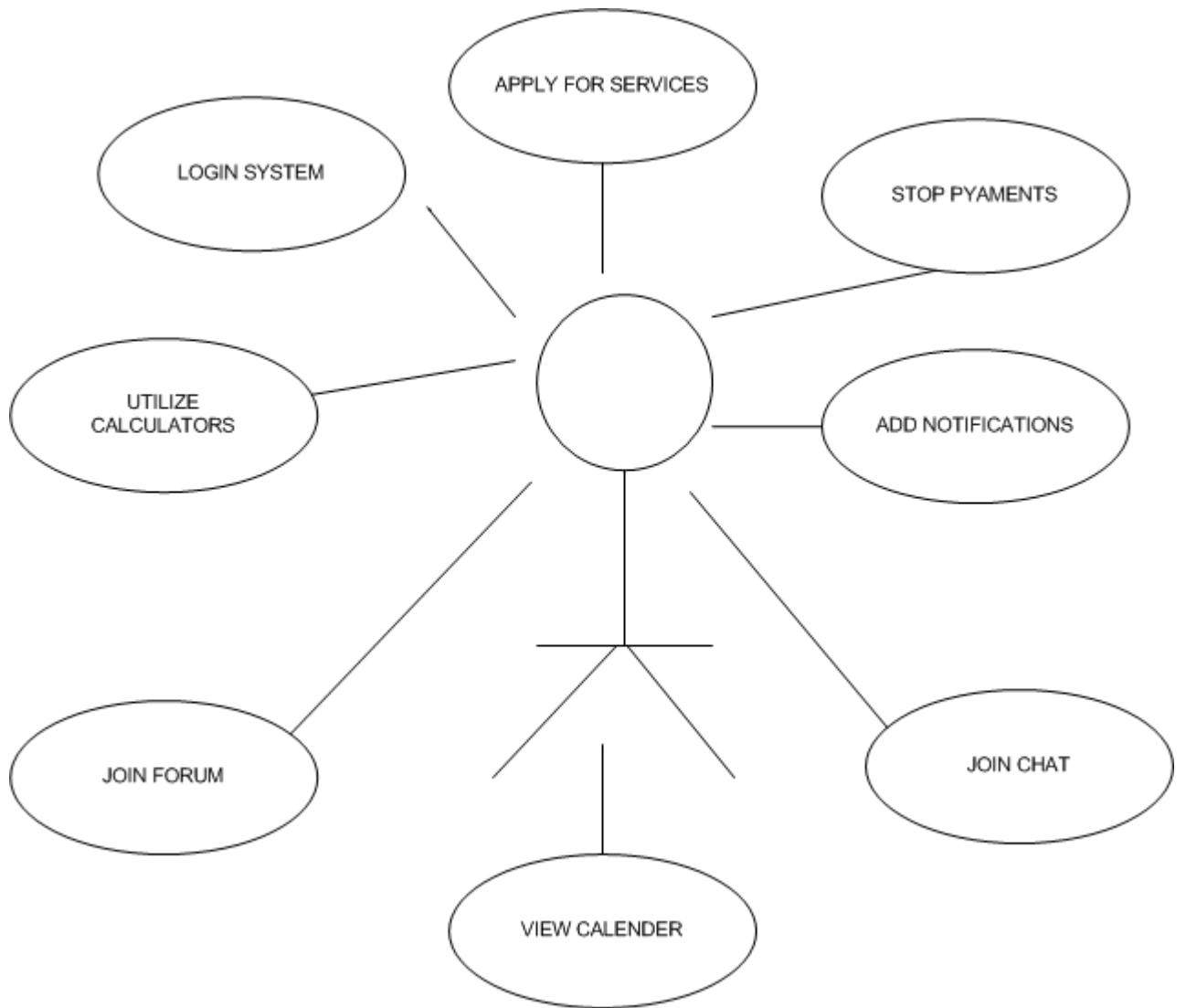
2.1.5 Who else is using such applications?

Es1 and Bank of America are two of the many banks in United States providing online banking services.

2.2 Analysis (Requirement analysis)

Analysis establishes requirements and identifies system needs. Special tools and techniques help the analyst make requirements determinations. One of the techniques is use case view. The use case s and actors define the scope of project. Uses cases include anything that is within the system and actors include anything that is outside the system. By analysis we will show the relationship between uses cases and actors.

USE CASE DIAGRAM OF ONLINE BANKING



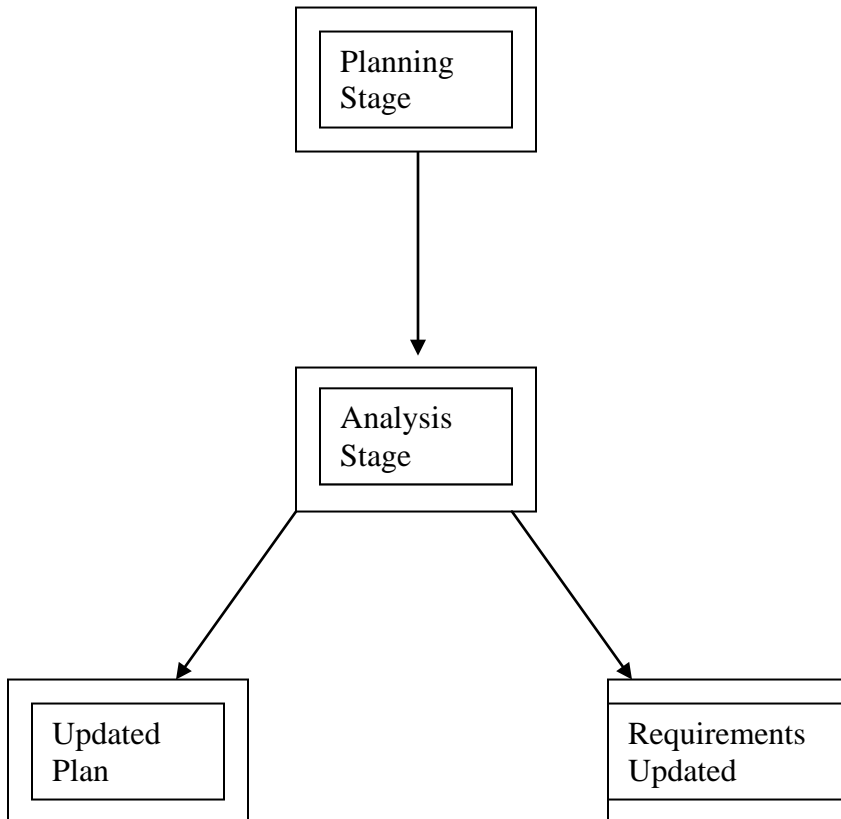


Fig:2.1 Requirement Analysis Phase In SDLC

2.3 Purpose Of The system

Purpose of project can be identified by the goals and the objectives. Basically we have goals of two types:

2.3.1 Informational goals: Indicate an intention to provide specific content and information to end-user.

2.3.2 Applicative goals: Indicate the ability to perform tasks within the application.

The customer can easily,

- Login in a secure environment
- View his accounts
- Add alerts /notifications
- Stop payment on checks
- Apply for loan
- Apply for credit cards
- Apply for ATM cards
- Utilize loan calculator
- Utilize simple calculator
- Utilize currency converter
- Utilize currency finder
- Email the bank
- Chat with the operator
- SMS anywhere
- View calendar
- Join the discussion forum
- Email Anywhere
- View Time
- View Events

2.4 Identifying The Target Audience

Along with defining the purpose of this web application, it is necessary to identify the Intended user(s) of the web application and The Target audience or this web application is anyone having a bank account.

2.5 Location of the Target Audience Located

Target audience of the web application has remote access to it.

2.6 Benefits Of Online Banking:

Benefits of Online banking are many and vary somewhat depending on the specific format used. In general, Online Banking is:

2.6.1 Flexible

It can be taken anytime, based on the user schedule within a work environment thus increasing the likelihood that a customer can participate.

2.6.2 Convenient

It can be completed anywhere, depending on format.

2.6.3 Economical

Reduces travel costs for the customer.

2.6.4 Efficient

- Customers can focus on their needs
- Customers can save time by not traveling to bank
- Bank managers can potentially reach a broader audience.
- Bank Managers can easily update online banking materials.

2.6.5 Exposure At A Distance

Customers can be exposed to wide range of utilities without relocating.

2.6.6 Wide Range Of Services

User can utilize wide range of services.

2.7 Scope Of Project

To determine the scope of project it is necessary to:

- Describes what technology is used to deliver data that produces the desired outcome ?
- How it works and which protocol it uses and does it provides a secure meeting. ?
- How will the target audience access this web application..?

Scope of Online Banking can be divided into following phases:

- Technology overview
- Process Modeling
- Technology Used In Web Application
- Conceptual Data Modeling

2.7.1 Technology Overview

Online banking is an important application on today's web world. These applications enable efficient communications between customer and bank.

The technological services offered in this application covers broad spectrum of utilities.

These are classified into 3 categories

- Account aggregation services
- Power Services
- Portal services
- Mathematical services
- Other services

2.7.1.1 Account aggregation “is a method that involves compiling information from different accounts, which may include bank accounts, credit card accounts, investment accounts, and other consumer or business accounts, into a single place. This may include a database or may be provided through "screen scraping" where a user provides the requisite account-access information for an automated system to gather and compile the information into a single page. Usually this database resides in a web-based application or in client-side software. While such services are primarily designed to aggregate financial information, they sometimes also display other things such as the contents of e-mail boxes and news headlines.

Account aggregation has evolved with single sign-on at most major banks.” [2.1]

2.7.1.2 Power Services

Beside account aggregation, the website provides following services as well.

- Apply for Loan
- Apply for new account
- Apply for cards
- Stop payment
- Adding notifications

2.7.1.2.1 Apply for Loan

Apply for loan is a facility in which the customer can add information for loan directly to the bank's database online, without going to the bank. On receiving the application the bank can later take necessary actions.

2.7.1.2.2 Apply for new account

Apply for new account is a facility in which the customer can add information for new account directly to the bank's database online, without going to the bank. On receiving the application the bank can later take necessary actions.

2.7.1.2.3 Apply for cards

Apply for cards is a facility in which the customer can add information for credit or atm cards directly to the bank's database online, without going to the bank. On receiving the application the bank can later take necessary actions.

2.7.1.2.4 Stop payment

Stop payment is a facility in which the customers can stop payment of single checks, multiple checks and cards directly to the bank's database online, without going to the bank. On receiving the application the bank can later take necessary actions.

2.7.1.2.5 Adding notifications

Add notification is a facility in which the customer can add notifications when the check is cleared , when the balance reaches certain limit and when the cards reaches certain limits, directly to the bank's database online, without going to the bank. On receiving the application the bank can later take necessary actions.

2.7.1.3 Portal Services are utilities that any portal has. It includes

- Email us
- Live help through chat facility
- Discussion forum

2.7.1.3.1 Email us

By using this facility the user can email the bank. On clicking the button Microsoft outlook will be opened and the user can write and send the email through it.

2.7.1.3.2 Live help through chat facility

By using this facility the user can log in to a chat room and directly chat with the banks operator.

2.7.1.3.3 Discussion forum

Discussion forums are nowadays found in every website. This application also provides a small forum where e the customer can write and view his views as wells others.

2.7.1.4 Mathematical services include those services which are useful for banking customers

- Simple calculator
- Loan calculator
- Currency converter
- Currency finder

2.7.1.4.1 Simple calculator

By using this facility the user can use a calculator online.

2.7.1.4.2 Loan calculator

By using this facility the user can use a loan calculator online. Enter loan amount, Annual Percentage Amount (interest rate), Repayment in years, Amount paid in a year. You will receive total amount paid, interest rate and total paid over years.

2.7.1.4.3 Currency converter

This facility provides user the ability to convert given list of currencies to specific currencies. Just choose the currency which you want as a source and then the currency in which you want to convert and press the convert button.

2.7.1.4.4 Currency finder

Currency finder is a facility in which the customer can select from a given list of countries and view their corresponding currencies.

2.7.1.5 Other Facilities

Beside the above mention facilities the following facilities have been added to the website.

- News Scroller
- Calendar
- Time

2.7.1.5.1 News Scroller

On the upper right corner of the website a news scroller has been added to provide the website with the facility of new events and news. The customer can easily view news on every page of the website.

2.7.1.5.2 Calendar

In the middle of the upper right corner of the website is a calendar .the customer can easily view calendar on every page of the website.

2.7.1.5.3 Time

On the top right corner of the website is given the current time. This time can be viewed on every age as well.

2.8 Process Modeling

Process Modeling involves graphically representing the functions or processes which captures, manipulate or store and distribute data between a system and the environment. and components of the system. We will use DFD a traditional process modeling technique.

2.8.1 Data Flow Diagram

DFD is versatile diagramming tools. With four symbols you can use data flow diagrams to represent both physical and logical information systems.

2.8.1.1 Source /sink

The origin or destination of data sometimes referred to as external entities.

2.8.1.2 Process

The work or actions performed on data so that they are transformed, stored or distributed.

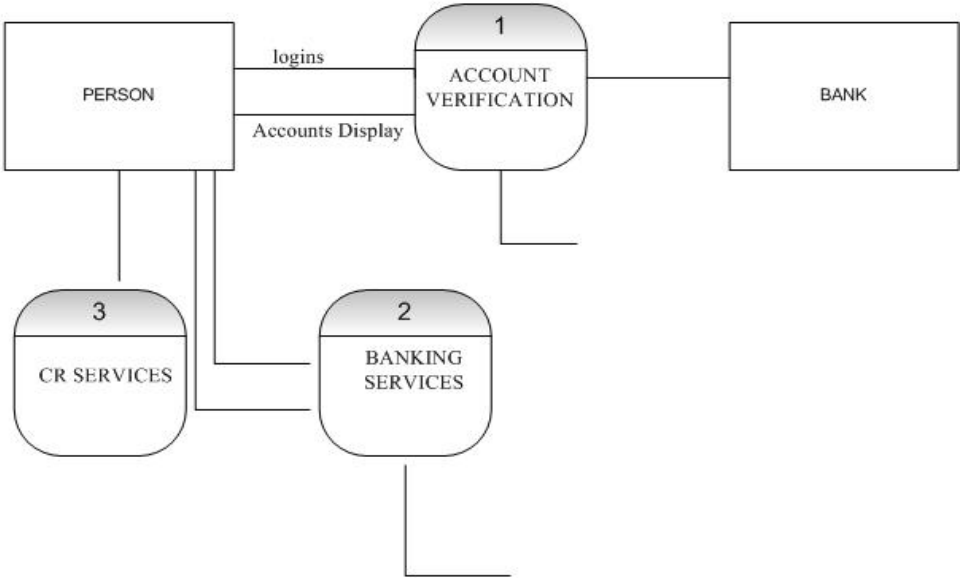
2.8.1.3 Data store

Data at rest which may take the form of many different physical representation.

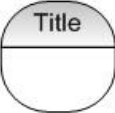

2.8.1.4 Data Flow

Data in motion moving from one place to another.

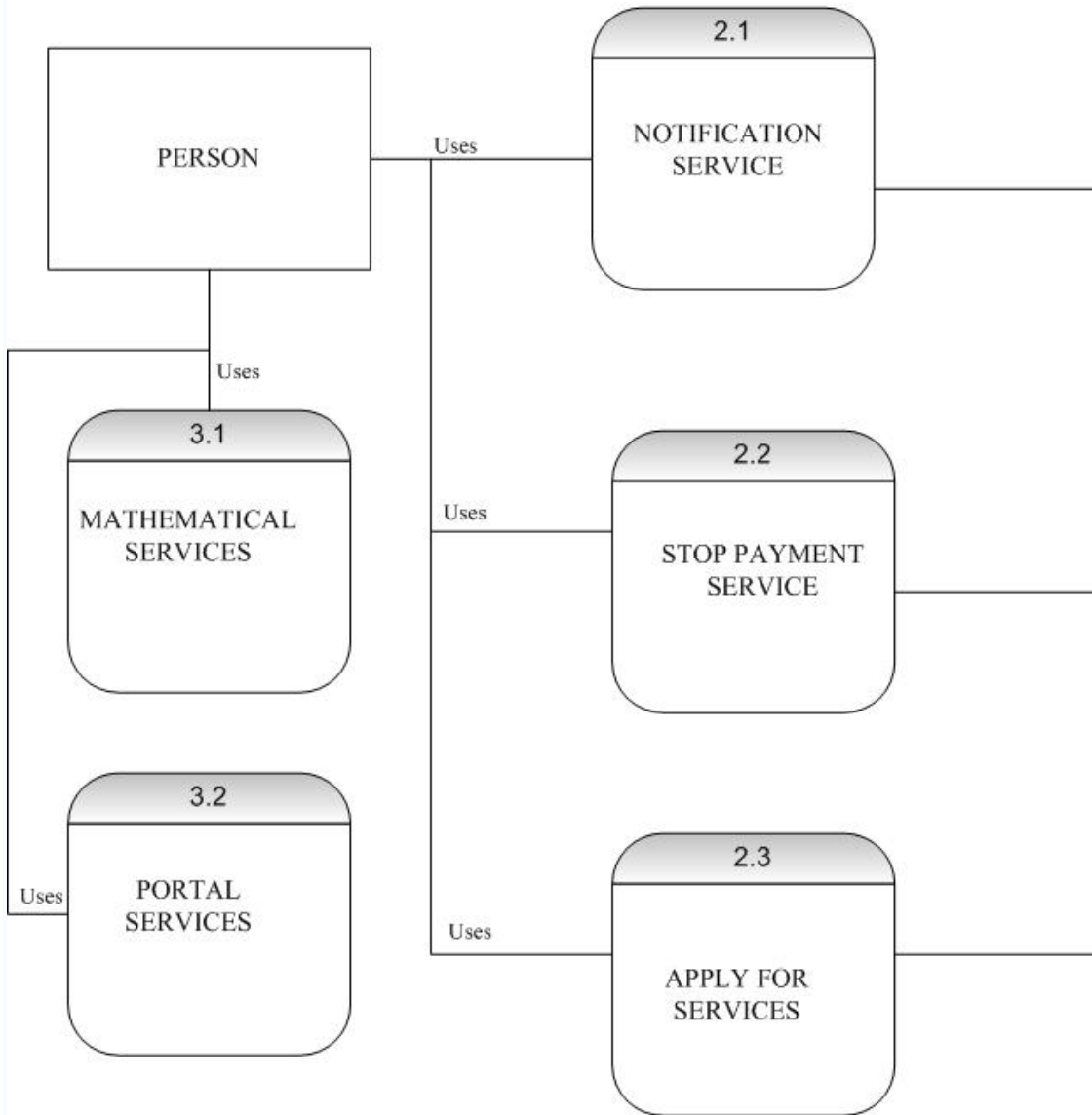
LEVEL 0 DFD



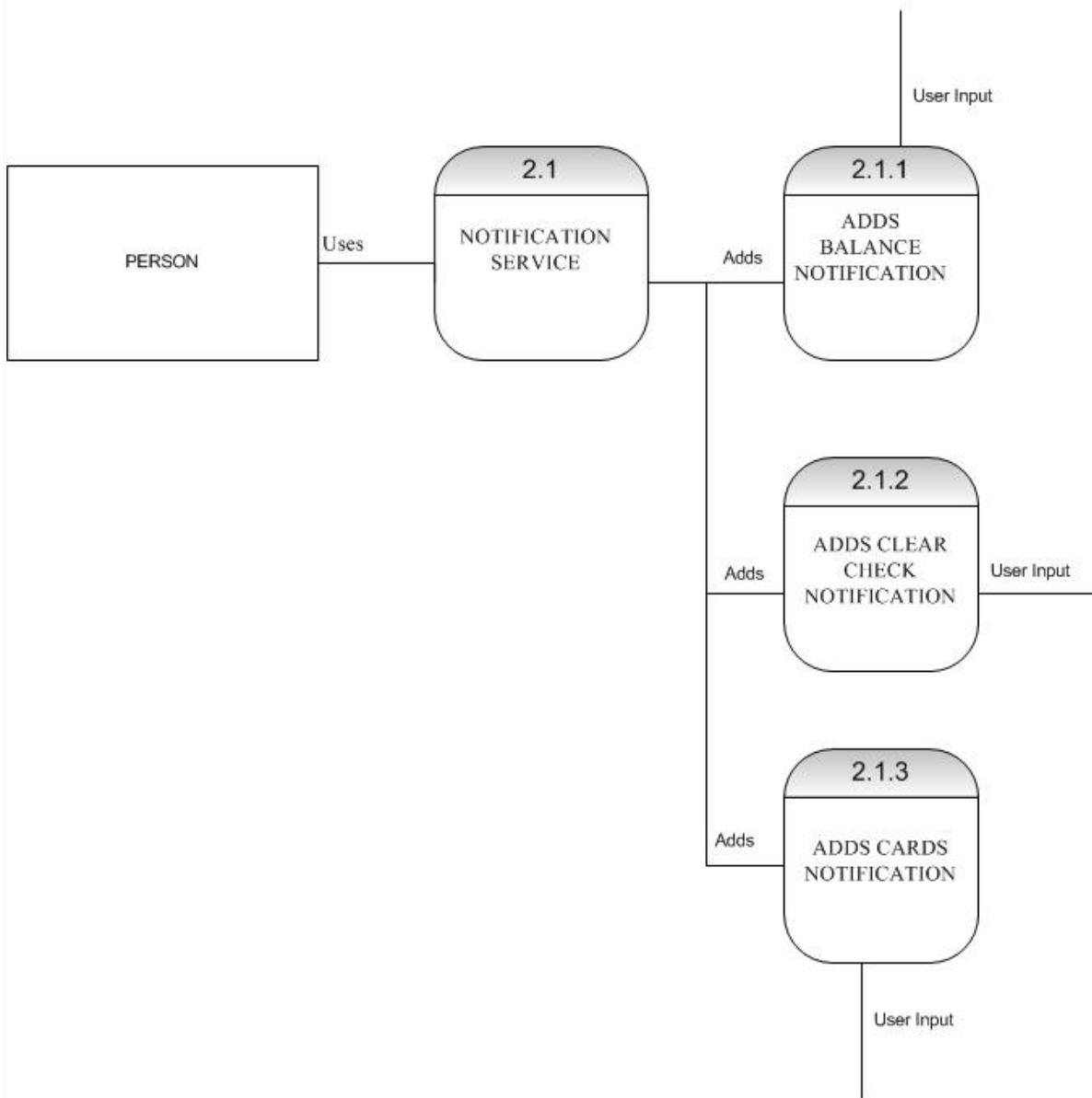
SYMBOLS

- Data Flow
-  Process
-  Source/
Sink

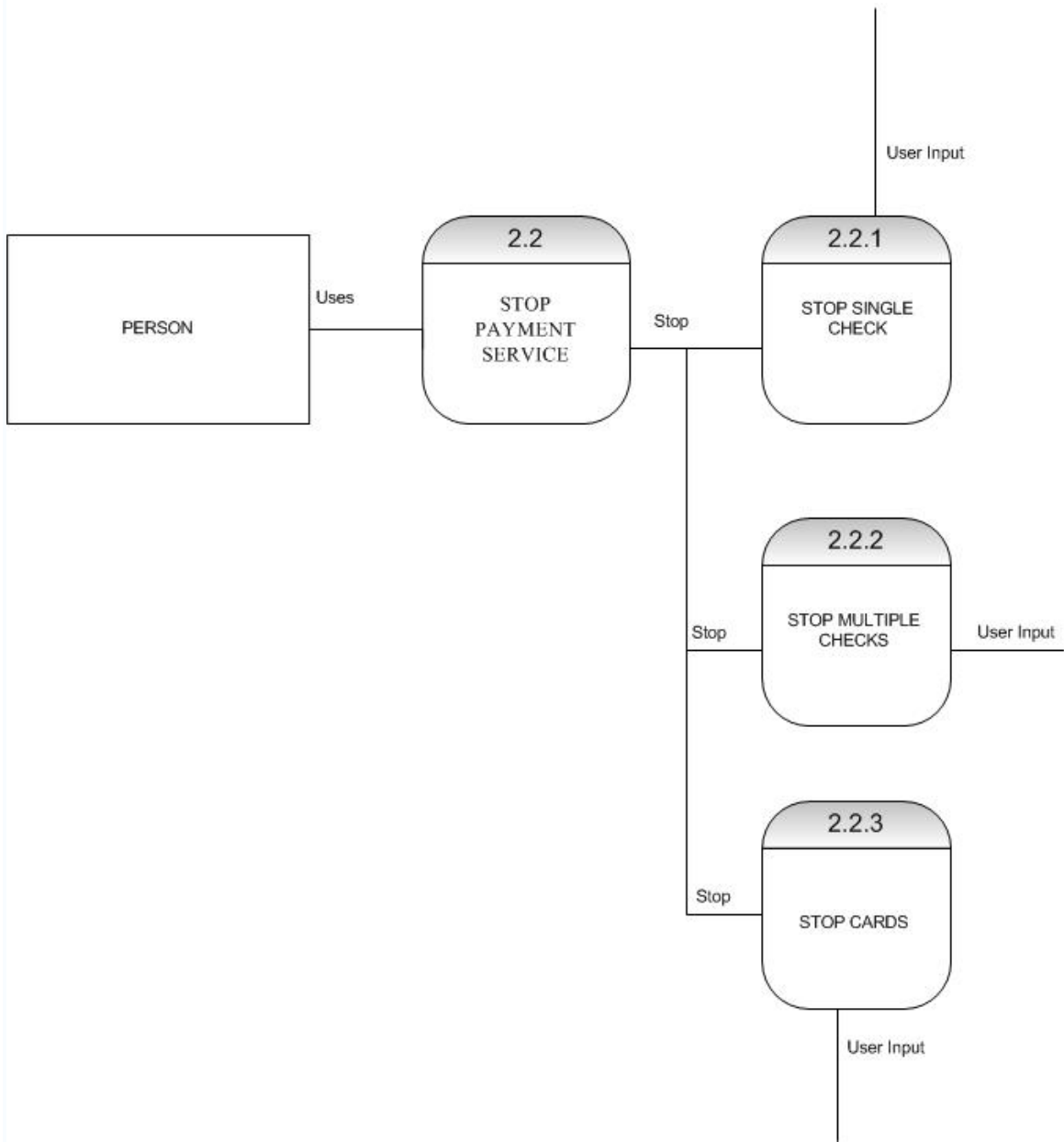
LEVEL1 DFD



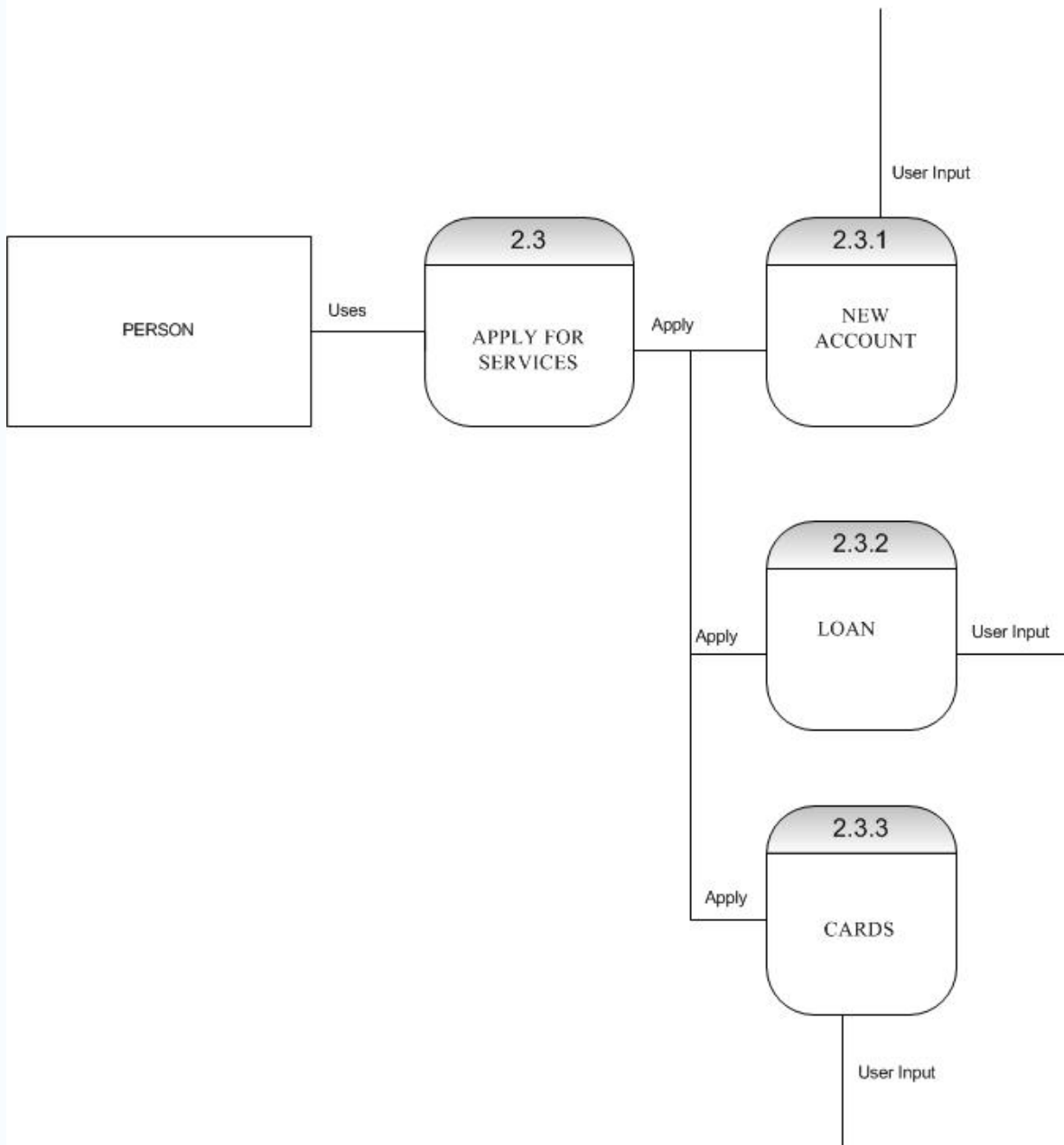
LEVEL 2 DFD



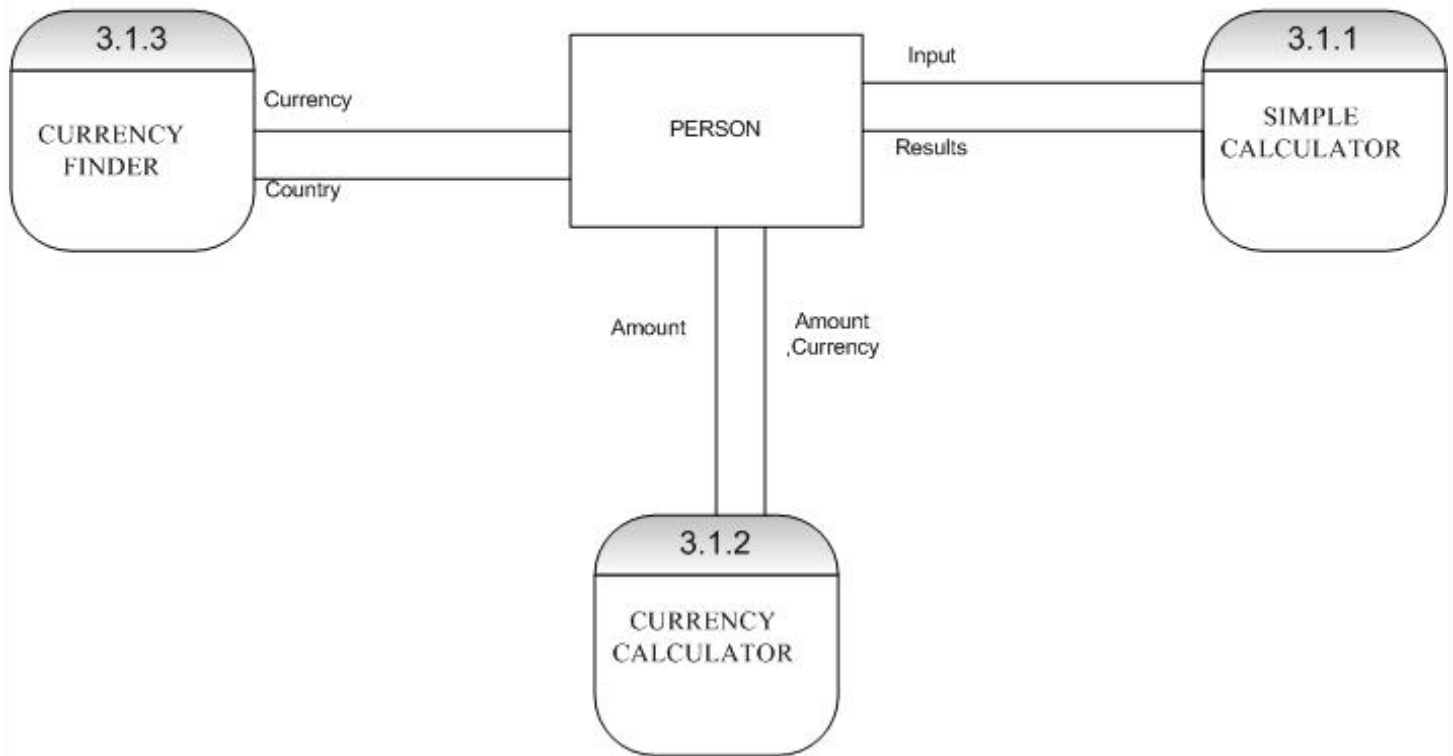
LEVEL 2 DFD



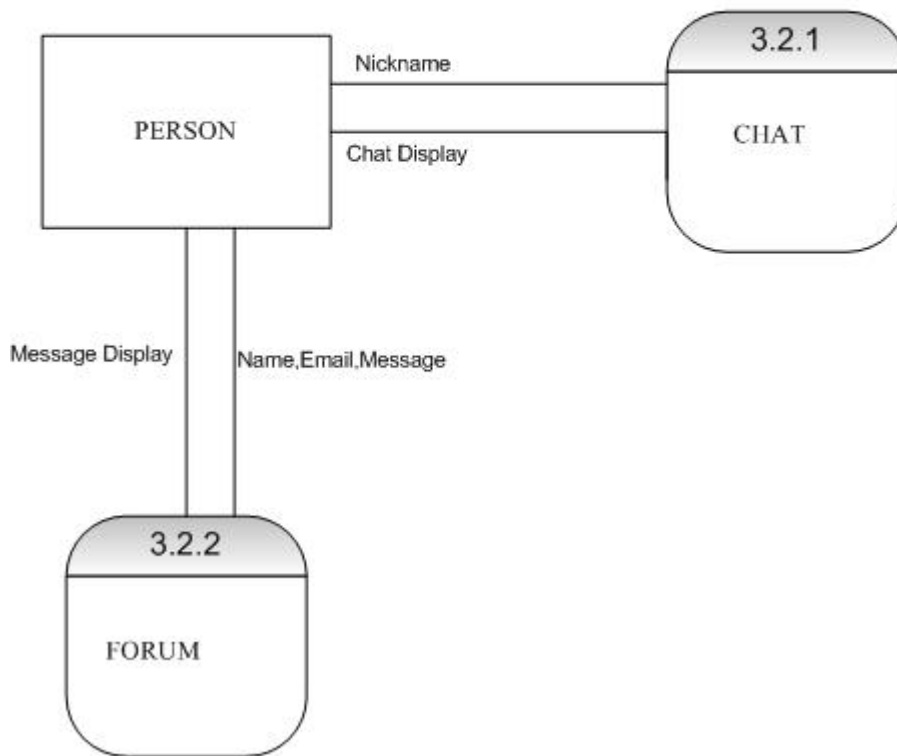
LEVEL 2 DFD



LEVEL 2 DFD



LEVEL 2 DFD



2.9 Technology Used In Web Application

This banking application is developed for internet; therefore the following technologies are used in it.

- ASP 3
 - Vbscript
 - Javascript
- SQL
- HTML

2.9.1“The **Internet** is a worldwide, publicly accessible series of interconnected computer networks that transmit data by packet switching using the standard Internet Protocol (IP). It is a "network of networks" that consists of millions of smaller domestic, academic, business, and government networks, which together carry various information and services, such as electronic mail, online chat, file transfer, and the interlinked web pages and other resources of the World Wide Web (WWW).

Terminology: Internet vis-à-vis World Wide Web

The Internet and the World Wide Web are not synonymous. The Internet is a collection of interconnected *computer networks*, linked by copper wires, fiber-optic cables, wireless connections, etc. In contrast, the Web is a collection of interconnected documents and other *resources*, linked by hyperlinks and URLs. The World Wide Web

2.9.2 Active Server Pages (ASP) is Microsoft's server-side script engine for dynamically-generated web pages. It is marketed as an add-on to Internet Information Services (IIS). Programming ASP websites is made easier by various built-in objects. Each object corresponds to a group of frequently-used functionality useful for creating dynamic web pages. In ASP 2.0 there are six such built-in objects: Application, ASPError, Request, Response, Server, and Session.

Session, for example, is a cookie-based session object that maintains variables from page to page.

Most ASP pages are written in VBScript, but any other Active Scripting engine can be selected instead by using the @Language directive or the <script language="language" runat="server"> syntax. JScript (Microsoft's implementation of ECMAScript) is the other language that is usually available.

2.9.3 VBScript (short for **Visual Basic Scripting Edition**) is an Active Scripting language developed by Microsoft. The language's syntax reflects its pedigree as a limited variation of Microsoft's Visual Basic programming language. VBScript is installed as default in every desktop release of the Windows Operating System (OS) since Windows 98. A VBScript script must be executed within a host environment, of which there are several provided on a standard install of Microsoft Windows (Windows Script Host, Windows Internet Explorer). Additionally, The VBScript hosting environment is embeddable in other programs, through technologies such as the Microsoft Script control (msscript.ocx).

2.9.4 JavaScript

JavaScript is a scripting language most often used for client-side web development. It is a dynamic, weakly typed, prototype-based language with first-class functions. JavaScript was influenced by many languages and was designed to have a similar look to Java, but be easier for non-programmers to work with. The language is best known for its use in websites (as client-side JavaScript), but is also used to enable scripting access to objects embedded in other applications.

Despite the name, JavaScript is essentially unrelated to the Java programming language; though both have a common debt to C syntax. The language was renamed from LiveScript in a co-marketing deal between Netscape and Sun in exchange for Netscape bundling Sun's Java runtime with their browser, which was dominant at the time. The key design principles within JavaScript are

inherited from the Self programming language."JavaScript" is a trademark of Sun Microsystems

2.9.5 SQL

SQL commonly expanded as Structured Query Language, is a computer language designed for the retrieval and management of data in relational database management systems, database schema creation and modification, and database object access control management.

SQL is a standard interactive and programming language for getting information from and updating a database. Queries take the form of a command language that lets you select, insert, update, find out the location of data, and so forth. There is also a programming interface.

Originally designed as a declarative query and data manipulation language, variations of SQL have been created by SQL database management system (DBMS) vendors that add procedural constructs, control-of-flow statements, user-defined data types, and various other language extensions..

2.9.6 HTML

HTML, an initialism of Hypertext Markup Language, is the predominant markup language for web pages. It provides a means to describe the structure of text-based information in a document — by denoting certain text as headings, paragraphs, lists, and so on — and to supplement that text with *interactive forms*, embedded *images*, and other objects. HTML is written in the form of labels (known as tags), surrounded by angle brackets. HTML can also describe, to some degree, the appearance and semantics of a document, and can include embedded scripting language code which can affect the behavior of web browsers and other HTML processors.”[2.2]

2.10 Conceptual Data Modeling

A conceptual data model is a representation of organizational data. It is a detailed model that captures the overall structure of organizational data while being independent of any database management system.

2.10.1 ER Model

A detailed logical representation of the entities, associations and data elements for an organization.

2.10.2 ERD Entity Relation Diagram

A graphical representation of an ER Model.

2.10.2.1 Entity

An Entity is a person, place, object, event or concept in the user environment about which the organization wishes to maintain data.

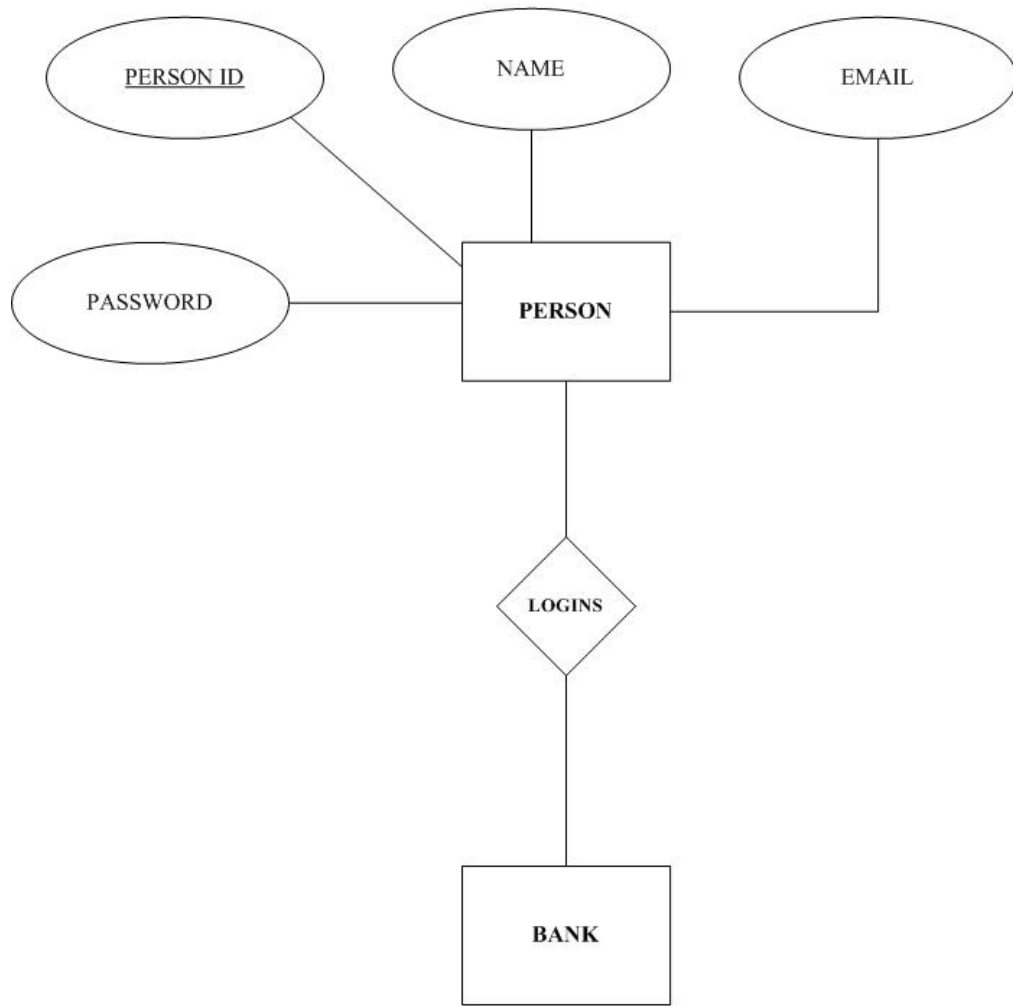
2.10.2.2 Attribute

A named property or characteristic of an entity that is an interest to the organization.

2.10.2.3 Relationship

An association between instances of one or more entity type s that is of interest to an organization.

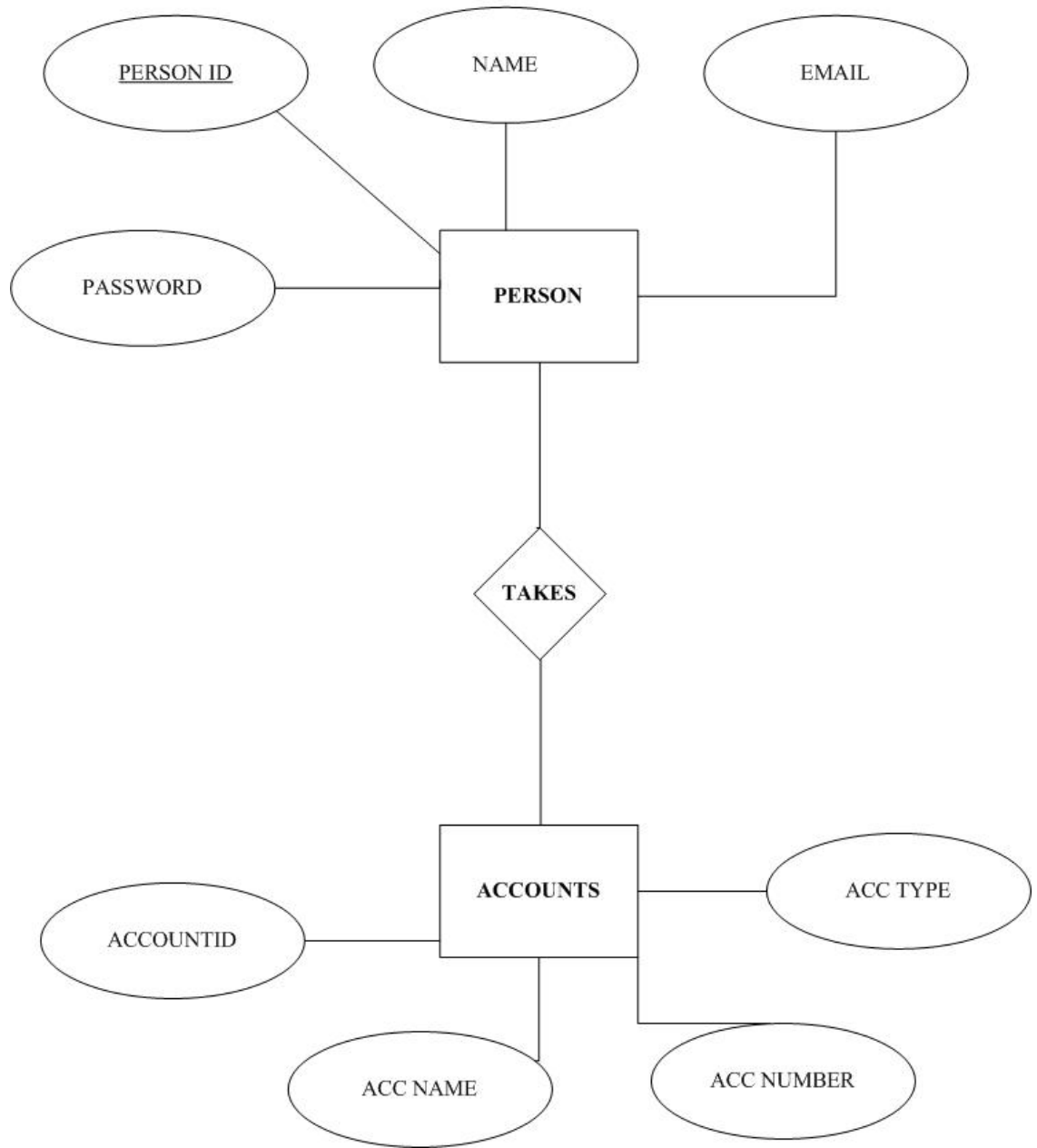
ERD OF LOGIN SYSTEM



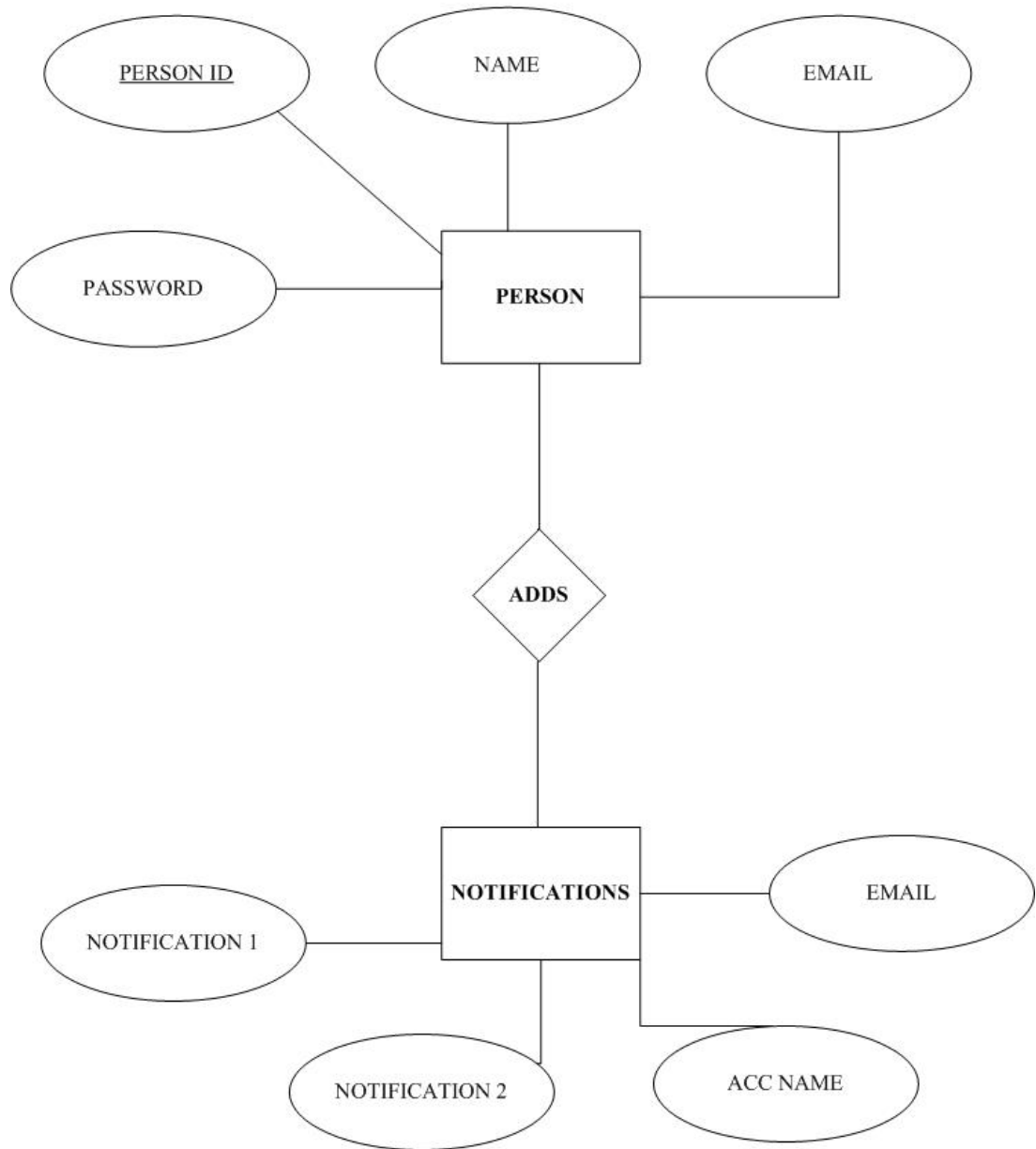
SYMBOLS



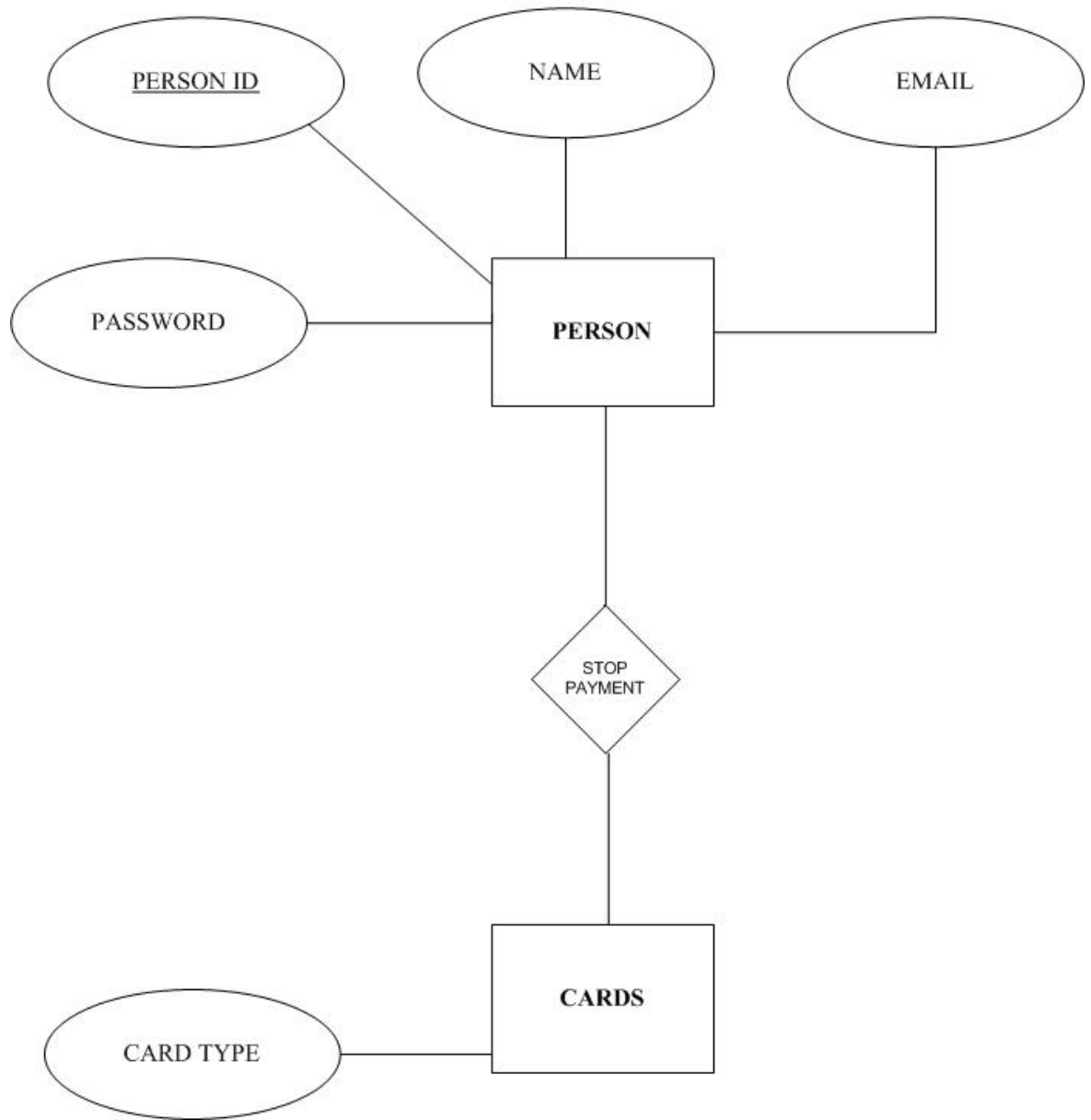
ERD OF ACCOUNTS



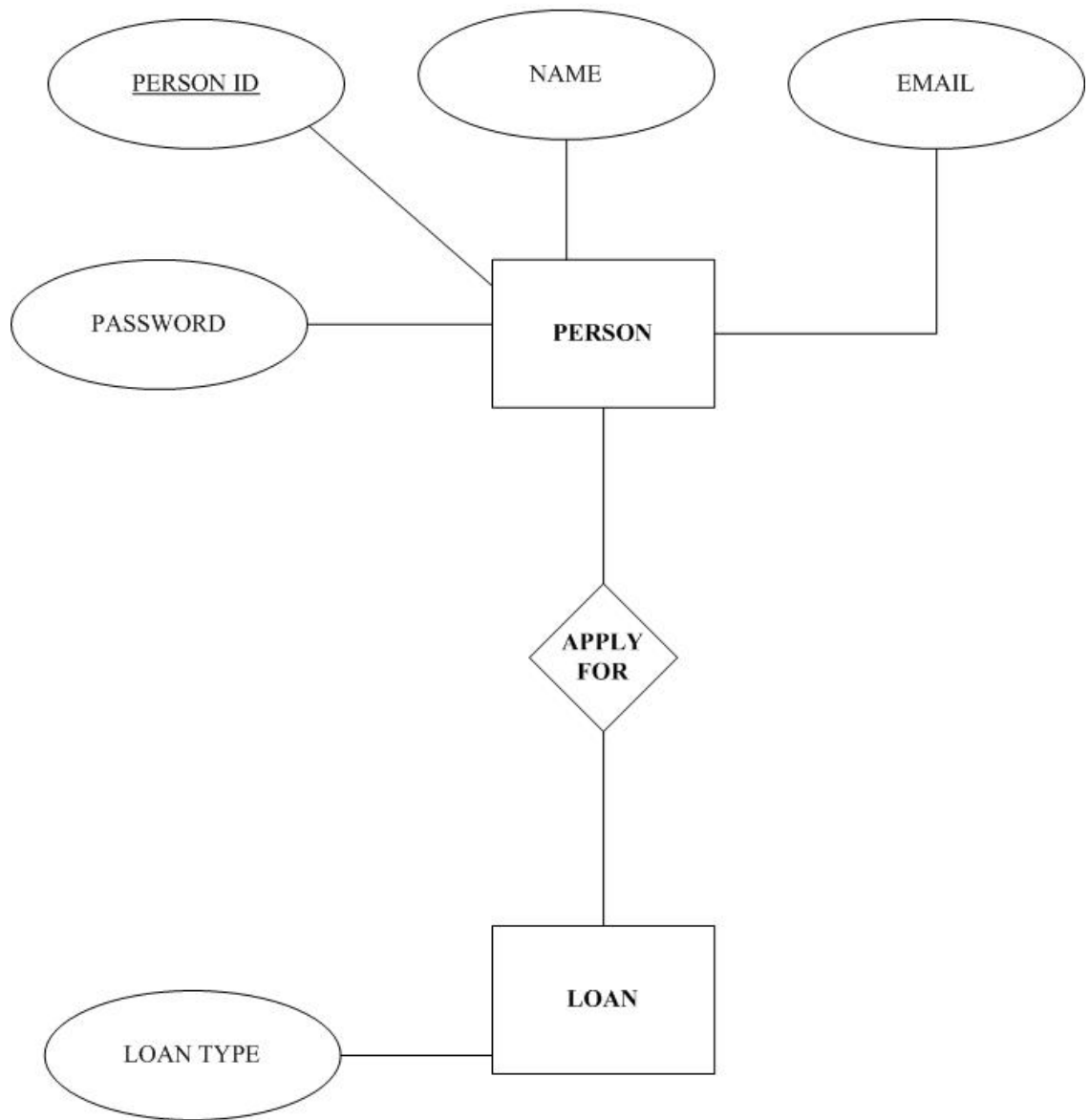
ERD OF NOTIFICATIONS



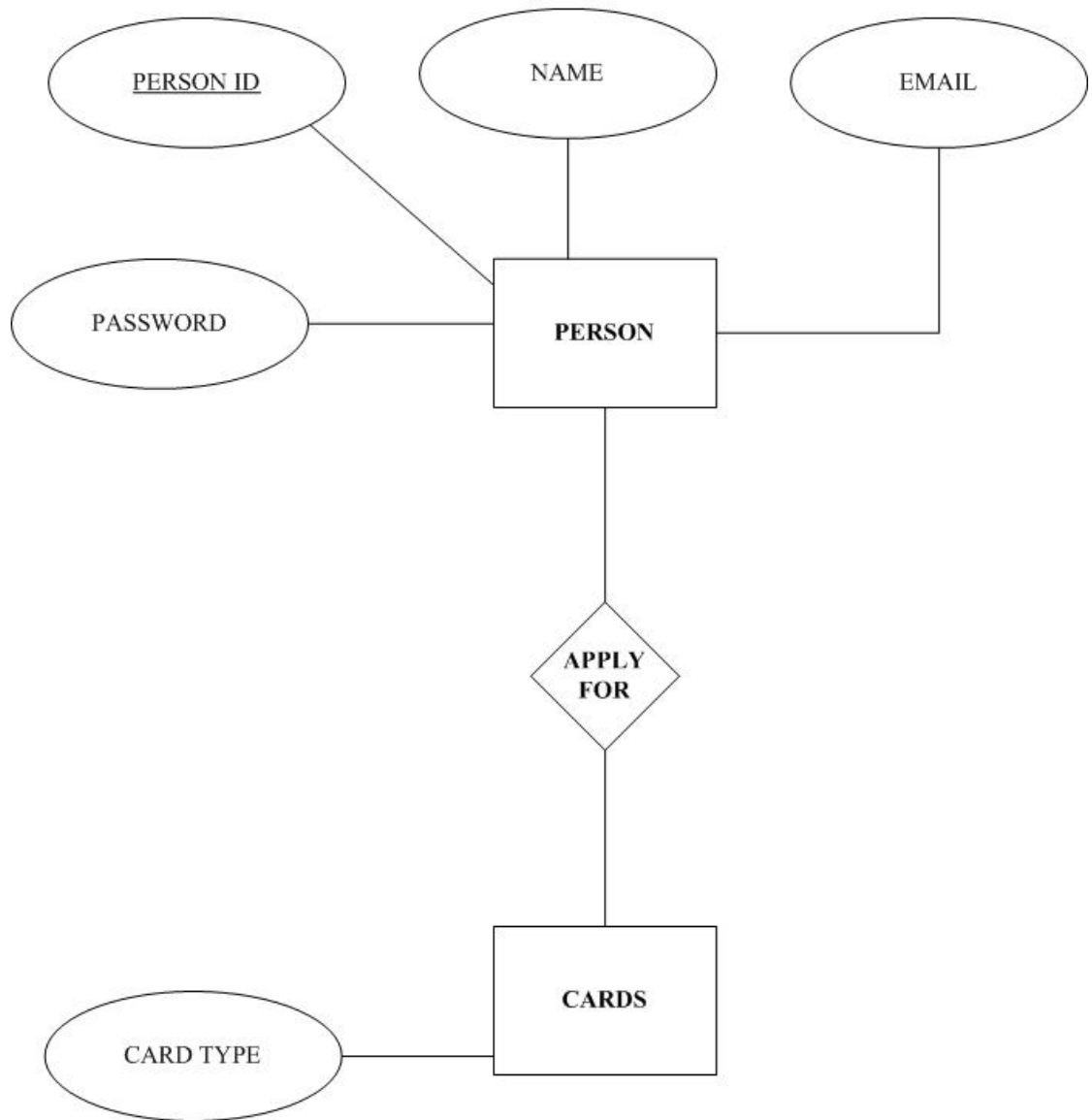
ERD OF CARDS



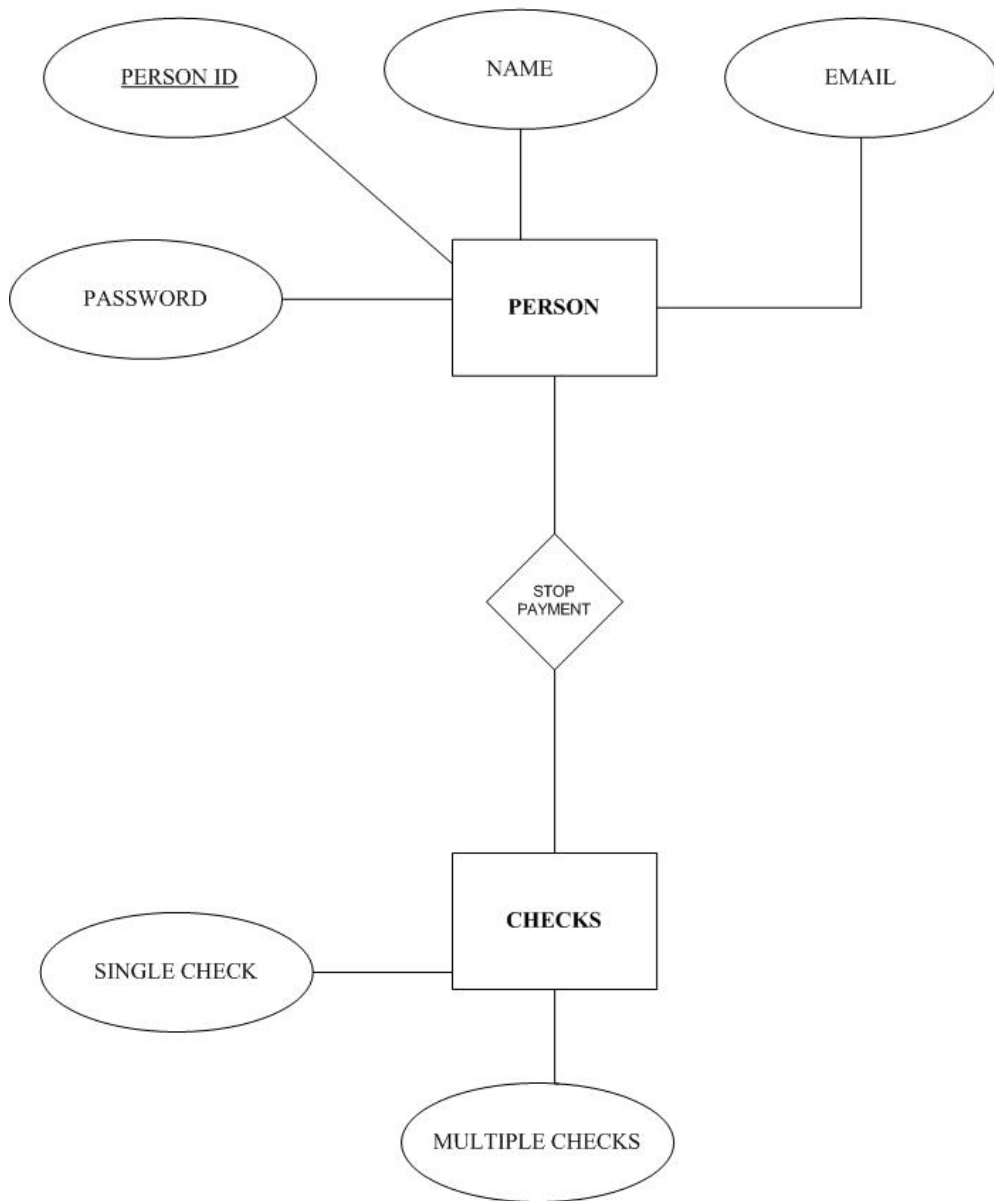
ERD OF LOAN



ERD OF CARDS



ERD OF CHECKS



Chapter 3

SYSTEM DEVELOPMENT

Once the system is proposed and software design has been accomplished, the next step is the development of the software according to the proposed system and design phase specification. The purpose of the development phase is to transform design into executable computer software, which may be tested and implemented as a new system. For software development, selection of the software and hardware is very vital for the success of any system.

3.1 Software Development Paradigm

There are several development approaches used in developing system and some are as follows:

- Top down approach
- Bottom up approach
- Inside out approach
- Mixed approach

3.1.1 Top Down Approach

In this approach, the development with a scheme contained high-level abstraction and successive top down refinements are applied. For example a main program is design first and then its subprograms are designed.

3.1.2 Bottom UP Approach

In this scheme, the developer starts with scheme containing basic abstractions and then combines or adds all these abstractions. For example all sub modules are written and tested separately and then these modules are combined in a main module.

3.1.3 Inside Out Approach

In this approach, the abstractions are focused on a set of concepts that are most evident. This is a special case of bottom up approach. Modeling them spreads outward by considering new concepts in the vicinity of existing ones.

3.1.4 Mixed Approach

Instead of following any particular approach through out the development, the requirements are portioned while using a top down approach and part of scheme is designed for each partition using a bottom up approach. The various schemes are then combined.

3.2 Project Development Approach

The development approach used in my project is the bottom up approach In this approach all the programs (pages/frames) are separately developed and checked, after that, they are linked with the main module (main frame/page).The vital advantage of using the bottom to up approach is that each and every module of the application is tested separately and modularity is be achieved. If any flaws are encountered in the sub modules, then they are retested until the desired results are produced. The verified modules are then attached to the main module (main web page).The main page is developed after developing the menu and attaching the sub modules to the menus items. This saves a lot of time and complexity. One of the most important benefits of using Bottom-to-up approach is that if we want to add any new component/module to our main module, then we can simply link it with the menu. The whole system will not be interrupted or damaged by adding, deleting or updating the sub modules. Thus this approach proves to be more efficient and easy as compared to other software development approaches.

3.3 Developing A Web Application

A network does not run successfully by itself. It has to be managed by knowledgeable personnel that can detect and resolve any problems that may occur. Their job will be easier if an administrative plan is developed and implemented. It is important to monitor your network for trends as it can help you to determine the overall "health" of the network. Now while developing software, web application or database following things should be kept in mind or predefined.

- Choosing an Administrative Plan
- Choosing The Network Types
- Taking Inventory
- Hardware Survey
- Software Survey
- Telecommunications Equipment Survey
- Requirements of the Network
- Building a Map
- Choosing the Topology
- Choosing Network Media
- Installing Network Media
- Connecting Media to Computers
- Choosing Network Operating Systems
- Organizing the Cable Plant

3.3.1 Choosing an Administrative Plan

One of the most important aspects to consider when implementing a network in any business is the administrative plan that you use. The administrative plan needs to take into account the growth of the personal computer industry and the effect it has had on the needs of information services for businesses.

In this project we are concerned with delivering online banking facility and other relevant information to many customers via web application.

3.3.2 Choosing The Network Types

The first practical step is to choose the network type in implementing a network. We already know that two types exist.

- Server based networks
- Peer based networks

In this project we choose server based or client/server networks.

3.3.3 Reasons Of Choosing Server Based Networks.

There are several advantages of a server-based network. Some of them are as follows.

- Resource sharing can be centrally located so that resources are easier to support. This also makes it easier for clients to be closely located vs. being spread out among several computer systems in what may seem like a random fashion.
- Security is often the main reason for using a server-based network. Security is managed by centralized administration that sets the policy for the entire network so that it is applied equally to every user on the network.
- Normally, most of the crucial data is stored on the servers so that the data can be backed up at a regular interval. This does not usually occur on a peer-to-

peer network because the backups are not centralized and the people sharing resources can change on a daily basis. Since the data is being backed up on a regular basis, you automatically have redundancy for the crucial data.

- The server-based network can support thousands upon thousands of users, which is impossible to do on a peer-to-peer network.

3.3.4 Taking Inventory

After deciding on the overall network design, our next step in creating a network is to take inventory to determine what hardware and software is already available and what needs to be acquired.

To take inventory, you'll need to survey four categories:

- Hardware
- Software
- Telecommunications equipment
- Network requirements

3.3.4.1 Hardware Survey

This is actually a simple process, but one that should not be taken lightly. Begin by recording the specifications of each computer; the details you gather at this stage can save time in the long run. If you know the specification details of the available equipment in advance, you can prevent many problems later on.

For each computer, you will need to gather information, including:

- Model.
- Processor manufacturer and speed.
- Amount of memory (RAM) installed.
- The size and manufacturer of each hard drive.
- Details of any other installed drives, such as compact-disc and removable disk drives.
- Monitor—make, model, and size.
- Video card—make, model, and amount of memory.
- Any installed peripherals.
- Type of bus—EISA, Micro Channel, ISA, or PCI—the computer uses and whether there are any free slots; you will need free slots to install network interface cards
- Make a list of the manufacturer and model number for any peripheral devices, such as printers, plotters, and scanners, whether they are installed or not. Note whether you have the original disk with drivers.

7.3.4.2 Hardware Used In This Project

There hardware profiles are as follows.

PC 1

- Intel P4Processor
- 333MHz
- 126.0MB RAM
- 20GB Standard Disk Drives
- Compact Disk 326MB
- Floppy Drive 1.38MB
- Plug and Play Monitor,LG,14 inches
- Realtek PCI fast Ethernet Network adapter, version 016
- Keyboard,mouse,printer,microphone,speakers,USB
- drivers

3.3.4.3 Software Survey

Be aware of all the software currently in use throughout the potential network. For example, if you were to convert all the computers to Windows NT while you were installing the new network, you might find that some of the old standby programs, once used on a daily basis, now no longer run. Be especially careful when evaluating custom-designed and proprietary programs, such as accounting databases that have been written especially for the company. You might need to contact the manufacturer for information about running proprietary programs on the network. Not all of these will run in a network environment; the product-licensing arrangement might not allow network operations.

For each software program, gather the following information:

- Program name
- Program version number
- Availability of the original installation floppy disks or compact discs
- Any licensing information

3.3.4.4 Software Used For This Project

The following soft wares has been selected for the implementation of the project:

- Windows NT/Me/2000/98
- Microsoft Internet Explorer Web Browser
- Macromedia Dreamweaver MX
- Microsoft Access 2000
- Nav studio 2005
- Flash 4D
- A4 Desk
- Text Scroller

3.3.4.4 .1 Web Server Operating System Software

Windows NT/2000/Me (featuring unified login under NTFS). Windows NT is a true 32-bit operating system. Windows NT has its own file system; "NTFS" (New Technology File System). NTFS is better than FAT16 (DOS/Windows file system), FAT32 (Win98 file system). Windows NT prevents applications from accessing your hardware directly, greatly reducing the risk of a system crash. Windows NT does not use conventional memory, as everything allocated to memory goes in "Physical Memory". The result is consistent performance when running multiple applications, a better overall multitasking experience, as well as better system reliability.

3.3.4.4.2 Client Side Software

Internet Explorer Web browser

Internet Explorer makes it easier to get the most from the World Wide Web, whether you are searching for new information or browsing your favorite Web sites. And built-in IntelliSense technology can save you time completing routine Web tasks, such as automatically completing Web addresses and forms for you, and automatically detecting your network and connection status. Following are its popular uses:

- The easiest way to get around the Web
- A customizable browser
- The best choice for laptops
- Safety in browsing the Web
- Displays Web pages in other languages

3.3.4.4 .3 Web Content Software

Macromedia Dreamweaver MX is a professional HTML editor for designing, coding, and developing websites, web pages, and web applications. Whether you enjoy the control of hand-coding HTML or prefer to work in a visual editing environment, Dreamweaver provides you with helpful tools to enhance your web creation experience.

The visual editing features in Dreamweaver let you quickly create pages without writing a line of code. If you prefer to code by hand, however, Dreamweaver also includes many coding-related tools and features. And Dreamweaver helps you to build dynamic database-backed web applications using server languages such as ASP, ASP.NET, ColdFusion Markup Language (CFML), JSP, and PHP.

3.4 Building a Map

Now it's time to lay out the network. But before we begin to recommend a network plan for our university, we will first need to make a map of all the elements involved. During this step, one should consider two aspects of the network: the physical layout, including the location of each piece of hardware and how it relates to the others, and the physical and logical topology of the proposed network.

Use a drawing or map of the facility—or make one if it doesn't exist already—and mark the location of the existing equipment.

3.5 Installation

At first installation of servers and drivers seemed an impossible and dangerous task for the system to be done, but through my experience I learned that installing system soft wares are as easy as installing any application soft wares. Following soft wares required for this project were installed by me.

- Windows NT/2000/ME
- Internet Information Services
- Personal web server
- Macromedia Dreamweaver MX
- Nav studio 2005
- Flash 4D
- A4Desk
- Text Scroller

3.6 System Architecture

Development of an Online Banking is based on two-tier architecture. Two tier architectures are best suited for Web based project.

3.7 The Architecture OF 2 Tier OR Client-Server

Client-Server architecture evolved in response to the drawbacks of the mainframe and PC/file server computing environments. By combining the processing power of the mainframe and the flexibility and price of the PC, Client-Server architecture encompasses the best of both worlds

Client-Server database computing can be defined as the logical partitioning of the user interface and data server and logic between the client computer and the server computer. The network links each of these processes.

3.7.1 Client Computer

The *client computer*, also called a *workstation*, controls the user interface. The client is where text and images are displayed to the user and where the user inputs data. The user interface can be text based or graphical based. In this project client will access the server for receiving data or accounts information.

3.7.2 Server

This computer controls data management. Te data may be text files, video or audio. The server is where data is stored, manipulated, and retrieved. In the Client-Server environment, all data (text,audio,video) processing occurs on the server.

3.7.3 Concept

Business logic can be located on the server, on the client, or mixed between the two. This type of logic governs the processing of the application.

In the typical corporate environment, the server computer is connected to multiple client computers. The server computer is a high-powered computer with maximum storage capacity. The client workstations are usually PC based. The client computer and server communicate through a common network protocol that enables them to share information.

3.7.4 Why Client Server Architecture

Many corporations have turned to client/server architecture as their computing answer. Following are some of the underlying reasons for its popularity:

- **Affordability**

Client-Server architecture can be less expensive than mainframe computing. The underlying reason is simple Client-Server architecture is based on an open architecture, which allows more vendors to produce competing products, which drives the cost down. This is unlike mainframe-based systems, which typically use proprietary components available only through a single vendor. Also, Client-Server workstations and servers are often PC based. PC prices have fallen dramatically over the years, which have led to reduced Client-Server computing costs.

- **Speed**

The separation of processing between the client and the server reduces network bottlenecks, and allows Client-Server architecture to deliver mainframe performance while exceeding PC/file server performance.

- **Adaptability**

The Client-Server architecture is more open than the proprietary mainframe architecture. Therefore, it is possible to build an application by selecting hardware from another vendor, and development software from another vendor. Customers can select components that best fit their needs.

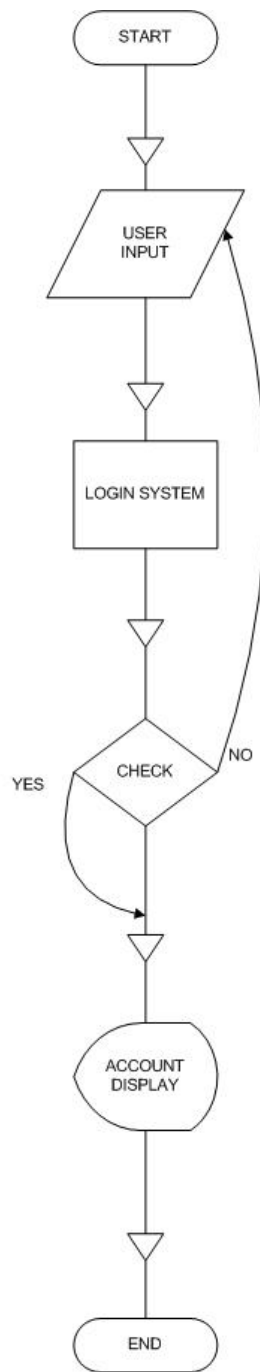
- **Simplified data access**

Client-Server architecture makes data available to the masses. Mainframe computing was notorious for tracking huge amounts of data that could be accessed only by developers. With Client-Server architecture, data access is not limited to those who understand procedural programming languages (which are difficult to learn and require specialized data access knowledge). Instead, data access is provided by common software product tools that hide the complexities of data access. Word processing, spreadsheet, and reporting software are just a few of the common packages that provide simplified access to Client-Server data.

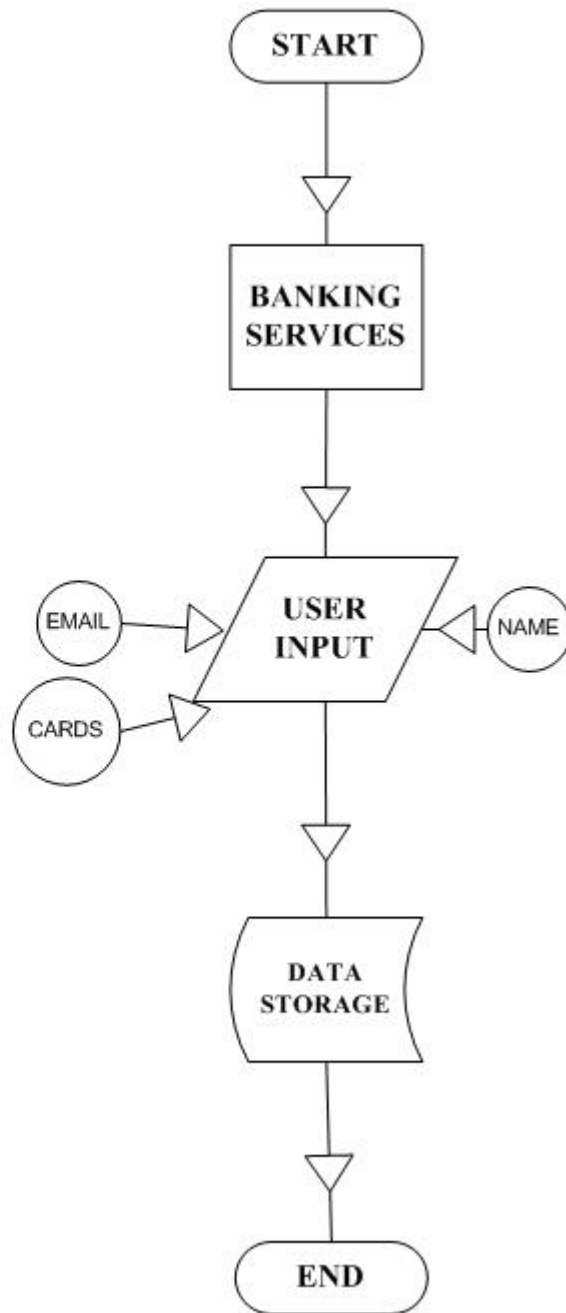
3.8 Flowcharts

A visual unstructured approach to program design is the use of flowcharts. Flowcharts are used to represent more physical entities such as storage rather than logical process and functions. Flowcharts are self explanatory. Following are some system flowcharts.

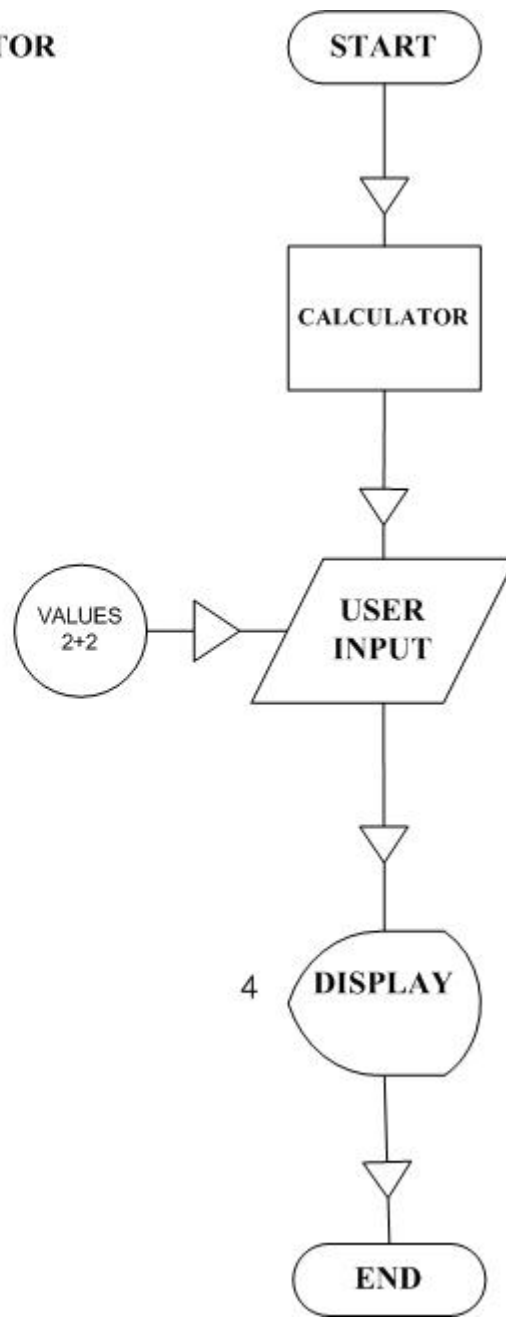
FLOWCHART OF LOGIN SYSTEM



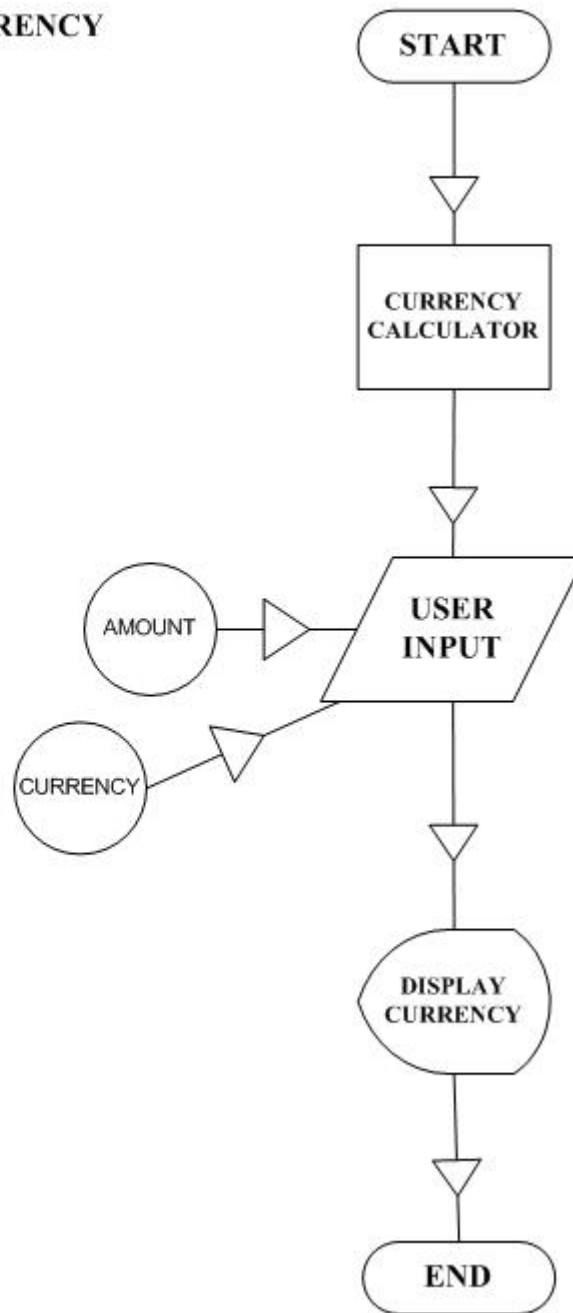
FLOWCHART OF BANKING SERVICES



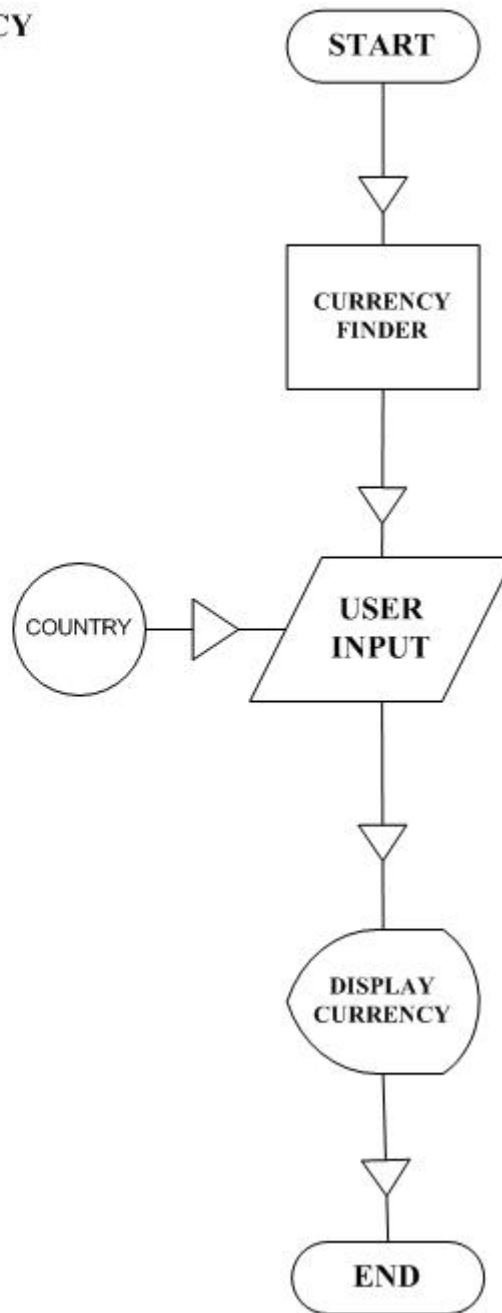
FLOWCHART OF CALCULATOR



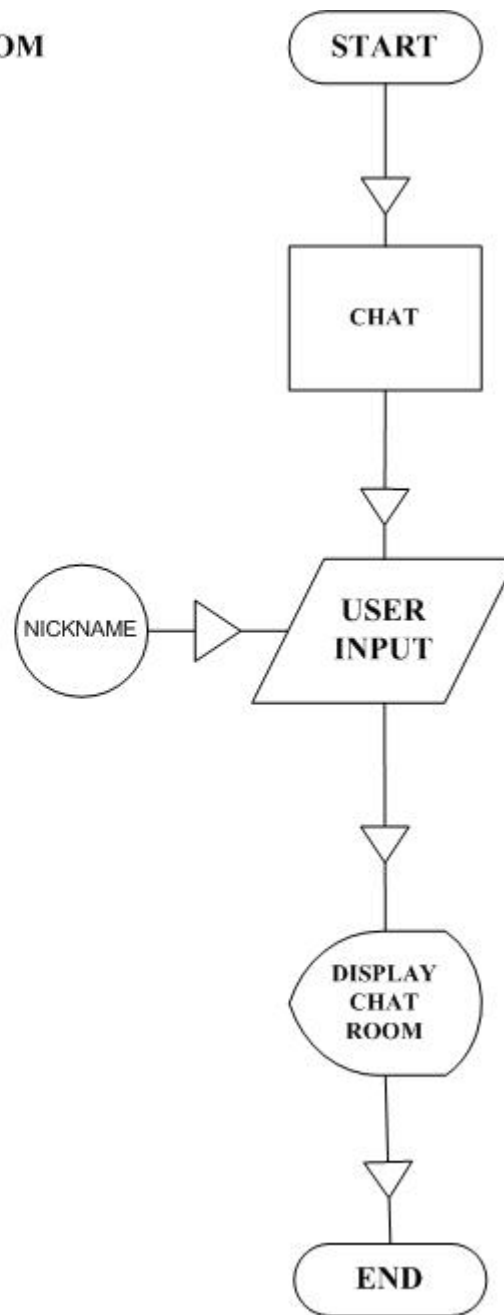
**FLOWCHART OF CURRENCY
CALCULATOR**



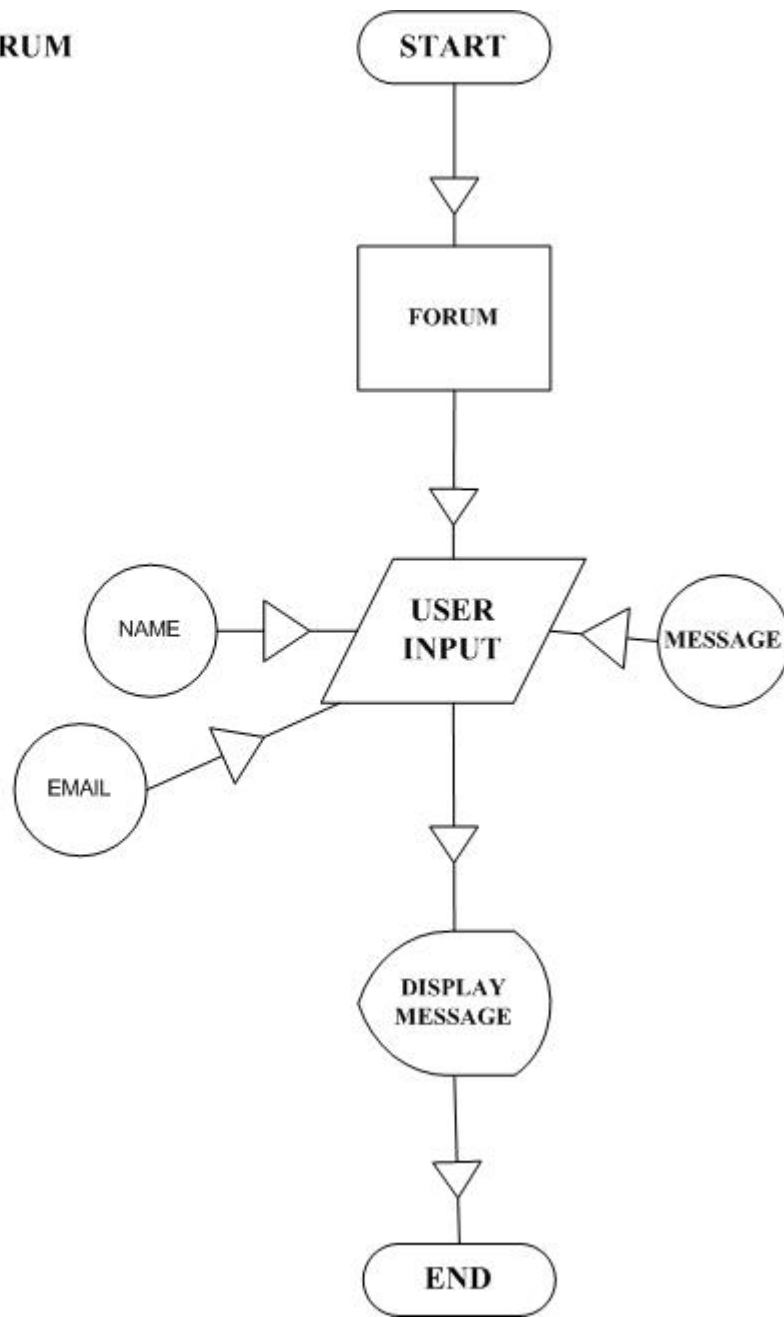
**FLOWCHART OF CURRENCY
FINDER**



FLOWCHART OF CHAT ROOM



FLOWCHART OF FORUM



3.9 Developmental Steps Of Proposed System

Following are the steps in development of proposed system

3.9.1 Developing banking Modules

Following major banking modules were developed in ASP by me.

- Account detail login page
- Balance notification
- Clear check notification
- Cards notification
- Stop payment on checks
- Stop payment on cards
- Apply for loan
- Apply for new account
- Apply for new card

3.9.1.1 Account detail login page

This page has been created using ASP Vbscript. The page contains login form in which the user has to enter the login and password. After the login is successful, registered users menu is opened and account detail of the user is shown.

3.9.1.2 Balance Notification Page

This page has been created using ASP Vbscript. The page contains Balance notification form in which the user has to enter account name, balance check minimum amount and maximum amount and email address. The information entered is stored in the bank's database.

3.9.1.3 Clear Check Notification Page

This page has been created in ASP Vb script. The page contains clear check notification form in which the user has to enter account name, check number and email address. The information entered is stored in the bank's database.

3.9.1.4 Cards Notification Page

This page has been created in ASP Vbscript. This page contains Cards notification form in which the user has to enter the card type i.e. ATM or Credit card, balance limit and email address. The information entered is stored in the bank's database.

3.9.1.5 Stop Payment On Single Checks Page

This page has been developed in ASP Vbscript. This page contains Stop payment On Single Checks form in which the user has to enter the Account Name, comment, Check Number, Check Amount, Payee Name and Check Issuance Date. The information entered is stored in the bank's database.

3.9.1.6 Stop Payment On Multiple Checks Page

This page has been developed using ASP Vbscript. This page contains Stop payment on multiple checks form in which the user has to enter Account name, comment, check sequence to and check sequence from. The information entered is stored in the bank's database.

3.9.1.7 Stop Payment On Cards Page

This page has been developed using ASP Vbscript. This page contains Stop payment on cards form in which the user has to enter the Account name, Card type i.e. ATM or Credit card and email address. The information entered is stored in the bank's database.

3.9.1.8 Apply For Loan Page

This page has been developed using ASP Vbscript. This page contains apply for loan form in which the user has to enter the account name, type of loan i.e. car financing, house building and email address. The information entered is stored in the bank's database.

3.9.1.9 Apply For Cards Page

This page has been developed using ASP Vbscript. This page contains apply for cards form in which the user has to enter the Accounts name, Card type and email address. The information entered is stored in the bank's database.

3.9.1.10 Apply For New Account Page

This page has been developed using ASP Vbscript. This page contains apply for new account form in which the user has to enter account name, type of account, minimum balance and email address. The information entered is stored in the bank's database.

3.9.2 Developing Portal Services

- Chat facility
- Email facility
- Discussion forum
- Time form
- Calendar form

3.9.2.1 Chat Facility

This page has been developed in HTML. The page contains the chat form in which the user has to enter the nick name to log in and join the chat. The form also provides ability to log off.

3.9.2.2 Email facility

This page has been developed in HTML. The page displays a button of contact us. On clicking the button the Microsoft Outlook will be opened .The user can write email and send using Microsoft Outlook..

3.9.2.3 Discussion forum

This page has been developed in ASP Vbscript. The main page contains the form in which the user has to enter name, email and message. On submitting the information entered the user be directed to next page where he can view his message.

3.9.2.4 Time Form

This page has been developed in both ASP and HTML. First the page is developed in ASP. Then embedded in HTML. Using the framing technique the page is embed on the top of the right corner of the main page. The time utility is shown on every page for user convenience.

3.9.2.5 Calendar Form

The page is developed in HTML.The user can access to calendar displaying current day ,month and year on every page of the website.

3.9.3 Developing mathematical facilities

- Simple calculator
- Loan calculator
- Currency converter
- Currency finder.

3.9.3.1 Simple Calculator Form

This page has been developed in javascript. The page contains calculator which the user can access for financial help.

3.9.3.2 Simple Loan Calculator Form

This page has been developed in javascript. The page contains simple loan calculator form in which the user has to enter the Loan amount, Annual Pay Rate, payment in years and amount of payment in a year. On clicking the button the calculator will display total amount paid with interest, interest and amount per payment.

3.9.3.3 Currency converter

This page has been developed in javascript. The page contains list of source currencies and target currencies. The user has to choose the source, target and amount. This page is given to introduce an idea to help customers find currencies on online bank. The following countries are used.

- Austria
- Belgium
- Finland
- France
- Germany
- Ireland
- Italy
- Luxembourg
- Netherlands
- Portugal
- Spain
- Euro

3.9.3.4 Currency Finder

This page has been developed in javascript . The page contains list of countries whose respective currencies the user can find on clicking the button. The following countries are listed.

- Angola
- Antigua
- Austria
- Azerbaijan
- Bangladesh
- Bahamas
- Barbados
- Belarus
- Belgium
- Bolivia
- Boliviano
- Botswana
- Bosnia and Herzegovina
- Brazil
- China
- Ecuador
- Egypt
- Estonia
- French
- Hong Kong
- India
- Japan
- Malaysia
- Russia
- Ukraine
- United Arab Emirates
- United Kingdom

- USA
- Uzbekistan

3.9.4 Adding Graphics

The next step is to create interactive menus buttons and introductory trailers. Intros provide special impact to the end users and shows abstract about the website. Menus are created in such a manner that they are easy to read, understand and navigate. Font and Color are special factors while designing Graphical animations.

3.9.5 Designing the Html Forms

It is important that our Html forms are user friendly, which we can do by implementing proper client side data validation checks and making our forms easy to use. Html and Macromedia Dreamweaver are used in designing the forms. Framing technique is used in the overall website layout.

During this process all the modules are attached to the menus and then all the material is embed into web pages .HTML format provides easy navigation ,readability and browser facility. The whole system of web application is tested at user level for confirmation.

3.9.6 Processing Information Submitted by User

The last and most important step while building the web applications is that we detect the bad information or errors during development.

Chapter 4

**SYSTEM IMPLEMENTATION
AND TESTING**

Implementation is the activity of getting the designed system in operation. It is the most expensive and time-consuming phase of the entire development life cycle. Physical design specifications must be turned into working computer code, code must be tested until most of the errors have been uncovered and corrected, the system must be installed and users must come to rely on the new system. The new system may totally replace the existing system or may modify only a part of the existing system. In either case proper implementation is essential to provide a reliable system to meet organization's requirements. It is a planned process and requires the attention of the system designer. Two main aspects of the system implementation are discussed.

- System testing
- System conversion

4.1 System Testing

System testing integrates programs into system. Here not only individual programs and modules get tested many times but also the interfaces between modules and programs. Since testing is the basics for the system acceptance. So before getting the new system in operation, it is of vital importance to check that the new system is comprehensive within its limits and is fully correct. This can be achieved by testing program logic and accuracy in generated outputs. It provides permanent material and tools for the system maintenance and enhancement.

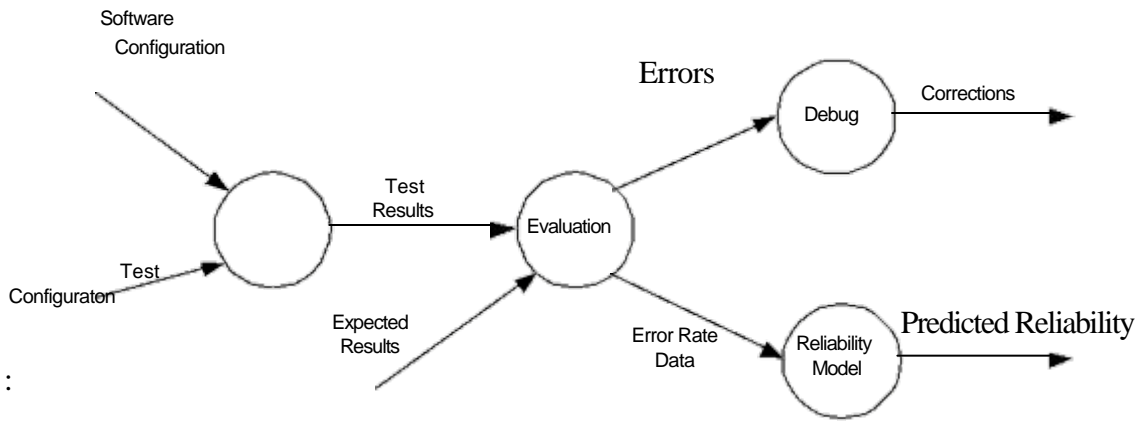


Figure 4.1. Testing Information Flow

Tha

□

4.2 Test Case Design Strategies

- Black-box or behavioral testing (knowing the specified function a product is to perform and demonstrating correct operation based solely on its specification without regard for its internal logic).
- White-box or glass-box testing (knowing the internal workings of a product, tests are performed to check the workings of all independent logic paths).

4.3 Types Of Testing

4.3.1 Validation Testing

- Ensure that each function or performance characteristic conforms to its specification.
- Deviations (deficiencies) must be negotiated with the customer to establish a means for resolving the errors.
- Configuration review or audit is used to ensure that all elements of the software configuration have been properly developed, cataloged, and documented to allow its support during its maintenance phase.

4.3.2 Acceptance Testing

- Making sure the software works correctly for intended user in his or her normal work environment.
- Alpha test (version of the complete software is tested by customer under the supervision of the developer at the developer's site).
- Beta test (version of the complete software is tested by customer at his or her own site without the developer being present).
- Performance testing (designed to test the run-time performance of software).

4.3.3 Unit Testing

At the lowest level Unit testing is performed. In unit testing the smallest piece of software often called unit or module and is basic unit as well is tested. In this website the smallest unit is *email us* button which when tested successfully opens Microsoft Outlook.

4.3.4 Integration Testing

When 2 or more components are combined into larger structure integration testing is performed. The test is conducted on both the unit level as well as on larger structure constructed. In this website of Online Banking first the testing is perform at unit level on Time form, calendar form and news scroller form. Then all these three units are combined for testing again as a single larger module.

4.4 General Test Criteria

General Test Criteria checks the:

- Interface integrity.
- Functional validity (test to uncover functional defects in the software).
- Information content (test for errors in local or global data structures).
- Performance (verify specified performance bounds are tested).

This project testing process use following approaches:

- Project content model is reviewed to uncover errors.
- Design model for project is reviewed to uncover navigation errors.
- Selected processing components and web pages are unit tested.
- Architecture is constructed and integration tests are performed.

- Assembled Project is tested for overall functionality and content delivery.
- Project is tested in a variety of different environmental configurations and the compatibility of project with each is assessed.
- Project is tested by a controlled and monitored group of end-users.
- Testing tables are constructed to evaluate the success of project.
- Each Testing Tables represent the forms of the web application, their respective input and results are observed.
- The testing tables are as follows.

4.5 System Conversion

System conversion is the stage where the system designers get the rewards of his painstaking. Several conversion plans were there to put the new system in operation but the best conversion plan is parallel conversion where the old system is also kept as backup. Since it is beyond the scope of the project to implement the system in a real time bank, so this step did not take place.

4.6 System Evolution

System evolution is the review of software products and related documentation for completeness, correctness, reliability and maintainability. And it, of course, includes judgment of the software to ensure that the system meets the specification and requirements for its intended use and performance.

TESTING TABLE 1

LOGIN

Test Name	Input	Result	Test Status
Login	Username, Password	Login Successful	Test Successful
Login	Password	Login Unsuccessful	Test Successful
Login	Username,	Login Unsuccessful	Test Successful

TESTING TABLE 2

NOTIFICATIONS

Test Name	Input	Result	Test Status
Clear Check Notifications	account name, check number and email address	Data Entered in the bank's Database	Test Successful
Balance Notifications	Account name, balance check minimum amount and maximum amount and email address.	Data Entered in the bank's Database	Test Successful
Cards Notifications	card type i.e. ATM or Credit card, balance limit and email address	Data Entered in the bank's Database	Test Successful

TESTING TABLE 3

STOP PAYMENT

Test Name	Input	Result	Test Status
Stop Payment Of Single Check	Account Name, comment, Check Number , Check Amount ,Payee Name and Check Issuance Date	Data Entered in the bank's Database	Test Successful
Stop Payment Of Multiple Checks	Account name, comment, check sequence to and check sequence from	Data Entered in the bank's Database	Test Successful
Stop Payment On Cards	Account name, Card type i.e. ATM or Credit card and email address.	Data Entered in the bank's Database	Test Successful

TESTING TABLE 4

APPLY FOR

Test Name	Input	Result	Test Status
Apply For New Account	Account name, type of account, minimum balance and email address.	Data Entered in the bank's Database	Test Successful
Apply For Loan	Account name, type of loan i.e. car financing, house building and email address.	Data Entered in the bank's Database	Test Successful
Apply For Cards	Accounts name, Card type and email address	Data Entered in the bank's Database	Test Successful

TESTING TABLE 5
MISCELLENEOUS

Test Name	Input	Result	Test Status
Email Us	Click Contact Us Button	Microsoft Outlook Opened	Test Successful
Chat	Nick Name	Chat room Joined	Test Successful
Forum	Name, Email and Message	Forum Joined	Test Successful
Demo	Click Demo Button	Flash Demo Opened	Test Successful
Calculator	$2*2+2-2/2$	2	Test Successful
Currency Finder	USA	Dollar	Test Successful

CHAPTER 5

SYSTEM EVALUATION

Throughout the systems development life cycle, the analyst, management, and users have been evaluating the evolving information system in order to give feedback for its eventual improvement. Evaluation is also called for following system implementation.

5.1 Evaluating Techniques

In order to evaluate a system, many techniques have been devised. Out of these we use the System Utility Approach.

5.2 System utility approach

The information system utility approach for evaluating information system can be comprehensive and fruitful technique for measuring the success of a developed system. It includes the following utilities.

- Possession utility
- Form Utility
- Place Utility
- Time Utility
- Actualization Utility
- Goal Utility

5.2.1 Possession Utility

Possession utility answers the question of who should receive output or who should be responsible for making decisions. In this application bank customers are the decision makers and the web application has been designed for them.

5.2.2 Form Utility

Form utility answers the question of what kind of output is distributed to the decision makers. The documents must be useful for the particular decision maker, in terms of their format. Information must be in appropriate form. This application satisfies form utility by placing all kinds of documents in an appropriate sequence. This application contains web pages delivered to users

5.2.3 Place Utility

Place utility answers the question of where information is distributed. Information must be delivered to the location where the decision is made. This project answers place utility too. Every control in this application delivers the appropriate information. For example by clicking login page the user will access his own private account information .If he clicks the menu of discussion forum then he will be automatically logout and reach general forum available for all users Thus everything is in its right place.

5.2.4 Time Utility

Time utility answers the question of when information is delivered. Information must arrive before a decision is made. This web application satisfies time utility too. Since it is a bank application so everything is dynamic. If a user stops some payment. He will be adding information in banks database. Everything he does affect the actual tables of bank. So everything is at real time. If the user wants to get real time help he will join the chat facility, if the user wants to discuss something hell join the forum.

5.2.5 Actualization Utility

Actualization utility involves how the information is introduced and used by the decision maker. In this project all information is stored in the database of bank. Any information send by user directs effect the database of the bank and thus changes the view of person account.

5.2.6 Goal Utility

Goal utility answers the why of information systems by asking whether the output has value in helping the organization obtain its objectives. This project achieves its goal of an online banking. Customers will get great benefits by this website which not only provides faq on online banking but also real time live chat with bank operator providing 24 hr service.

5.2.7 Evaluating The System

An information system can be evaluated as successful if it possesses all six utilities.

The information system utility approach of who, what ,when ,where ,why and how used to evaluate this system is workable and straightforward framework for evaluating large scale information system projects .Since this web application satisfies all six utilities ,thus it reflects a successful image of the hard work done in implementing it.

Chapter 6

CONCLUSIONS

6 Conclusion

Online banking has finally reached the point at which it is being accepted by consumers and is financially successful for the offering institutions. In fact, banks are finding that a comprehensive online banking strategy is essential for success in the increasingly competitive financial services market.

An online banking solution can be designed today that is more effective and less costly than the proprietary systems of only a few years ago due to technology advances and the rapid growth of the Internet. Major financial planning software packages or standard Web browser software can now initiate and monitor the banking transactions. The software offers a range of features for both the casual user and the sophisticated banking customer.

Ranging from a simple marketing presence on the Internet to an advanced online banking system an institution needs to consider various options in planning an online banking presence that revolutionizes the way in which the bank operates and the consumer conducts financial transactions. Regardless of the type of offering a bank decides to pursue, it is essential that the bank undertake a comprehensive analysis and planning process up front to ensure the success of the project

CHAPTER 7

FUTURE ENHANCMENTS

7.1 Current and future demand for Internet banking

“4 out of 10 banks are offering online services. So the allure of internet banking is strong. In spite you increase in internet banking, some new form of banking is also spreading widely.

- Phone banking
- Mobile banking

7.1.1 Telephone banking

Telephone banking is a service provided by a financial institution which allows its customers to perform transactions over the telephone.

Most telephone banking uses an automated phone answering system with phone keypad response or voice recognition capability. To guarantee security, the customer must first authenticate through a numeric or verbal password or through security questions asked by a live representative. With the obvious exception of cash withdrawals and deposits, it offers virtually all the features of an automated teller machine: account balance information and list of latest transactions, electronic bill payments, funds transfers between a customer's accounts, etc.

Usually, there is also the possibility to speak to a live representative located in a call centre or a branch, although this feature is not guaranteed to be offered 24/7. In addition to the self-service transactions listed earlier, telephone banking representatives are usually trained to do what was traditionally available only at the branch: loan applications, investment purchases and redemptions, chequebook orders, debit card replacements, change of address, etc.

Banks which operate mostly or exclusively by telephone are known as phone banks

7.1.2 Mobile Banking

Mobile banking (also known as M-Banking, m banking, etc.) is a term said for performing balance checks, account transactions, payments etc. via a mobile device such as a mobile phone. Mobile banking today (2007) is most often performed via SMS or the Mobile Internet but can also use special programs downloaded to the mobile device.

Trends in mobile banking

The advent of the Internet has revolutionized the way the financial services industry conducts business, empowering organizations with new business models and new ways to offer 24x7 accessibility to their customers.

Over the last few years, the mobile and wireless market has been one of the fastest growing markets in the world and it is still growing at a rapid pace.

According to a study by financial consultancy Celent, 35% of online banking households will be using mobile banking by 2010,

This opens up huge markets for financial institutions interested in offering value added services. With mobile technology, banks can offer a wide range of services to their customers such as doing funds transfer while traveling, receiving online updates of stock price or even performing stock trading while being stuck in traffic.

In the last 4 years, banks across the globe have invested billions of dollars to build sophisticated internet banking capabilities. The proliferation of the 3G (third generation of wireless) and widespread implementation expected for 2003-2007 will generate the development of more sophisticated services such as multimedia and links to m-commerce services.”[7.1]

***BIBLIOGRAPHY &
REFERENCES***

BJBLIOGRAPHY

Books

- System Analysis And Design by **KENDALL & KENDALL (3rd Edition)**
- Modern Systems Analysis and Design by **Jeffrey A. Hoffer, Joey F. George and Joseph S. Valacich (1996)**
- Mastering UML with Rational Rose by **Wendy Boggs and Micheal Boggs (1999)**
- Beginning ASP 3 by **WROX (2005)**
- Internet banking comptrollers handbook (1999)
- Tips for safe online banking by **FDIC (2000)**
- Internet Banking :Development and prospects ,by **Karen furst, (2000)**
- Current Issues In Economics and Finance ,
- The emerging role of banks in E-commerce ,by **John Wenninger ,vol 6,(2000)**
- Banking Basics ,by **Federal Bank of Boston,(2007)**
- Electronic Banking: The Ultimate Guide to Online Banking by **SCN Education B.V. (April 1, 2001)**
- Banking Online for Dummies by **IDG and Paul A. Murphy (1999)**
- Banking on clicks-and-mortar.(online banking): An article from: Bank Marketing by **Kevin Sheridan (Jul 28, 2005)**
- Online Banking Report by **Online Banking Innovations - Magazine Subscription**
- Online Banking : Enhancing Adoption of Paperless Statements by **Asaf Buchner, Corina Matiesanu, David Schatsky, and Vikram Sehgal (Feb 24, 2006)**
- The ABCs of Online Banking With Quicken 6 by **Michael Meadhra (- Nov 1996)**

E Learning

I Javascript The Definitive Guide by **OREILLY**

II Teach Yourself Javascript in 21 Days by **SAMS**

III Teach yourself ASP in 21 Days by **SAMS**

IV Teach Yourself HTML in 21 Days by **SAMS**

Websites

I Safe Internet Banking :

www.fdic.gov

II Ebanking :

www.ffeic.gov

III Online Banking

www.bankofamerica.com

IV Online banking tutorials

www.esl.org

V Online Banking:

www.wikipedia.com

VI Online Banking

www.ent.com

VII Exploring The Many Benefits of Online Banking:

www.ezinearticles.com

VIII Report On Online Banking :

www.emarketer.com

IX Transforming Consumer Banking Through Internet Technology:

www.dynamicnet.net

Readings

“Small Banks Won’t Be Web Holdouts for Long,” by **Agosta, Veronica (2000)**.

“The Internet’s Impact on Financial Services,” by **Azarchs, Tanya (2000)**.

“Virtual Banks Get Physical With ATMs,” by **Bank Network News (2000)**

. “Internet-Only A Hard Sell, Says Canada’s Royal Bank,” by **Costanzo, Chris (2000)**

“Banks Opting for Discrete Web Units,” by **Costanzo, Chris, and Adriana Senior (1999)**.

“‘Net Interest’ Grows as Banks Rush Online,” by **Couch, Karen, and Donna L. Parker (2000)**.

“Web-Only Banks Start to Get Real,” *Washington Post*, by **Day, Kathleen (2000)**.

“Wingspan Losing Altitude?,” by **Daudelin, Art (2000)**.

“Birth, growth, and life or death of newly chartered banks,” by **DeYoung, Robert (1999)**.

“Creating The Tie Between Internet Banking & ATMs,” by **Financial Service Online (1999)**.

“Technological Innovation in Banking and Payments: Industry Trends and Implications for Banks,” by **Furst, Karen, William W. Lang, and Daniel E. Nolle (1998)**.

“Banking in the age of information technology”, by **Jordan, John, and Jane Katz (1999)**.

“Recent Changes in U.S. Family Finances: Results from the 1998 Survey of Consumer Finances,” by **Kennickell, Arthur B., Martha Starr-McClure, and Brian J. Surette (2000).**

“The Impact of the Internet on Users and Suppliers of Financial Services”,by **Marks, James (1999).**

“Citigroup’s Internet Arm Sets Sights on Small Businesses,” by **Marlin, Steven (1999).**

. “E-Tailing vs. Bricks-and-Mortar,” by **McIntyre, L.H., and Chris Christensen (1999)**

. “What Will Technology Do to FinancialStructure,” by **Mishkin, Frederic S., and Philip E. Strahan (1999)**

“The Internet and U.S. Banks,” by **Moody’s Investors Service (2000a).**

“U.S. Bancorp Builds Up B-to-B Service,”by **O’Brien, Jeanne (2000).**

“Internet Cash Management Takes Off,” by **O’Connell, Brian (2000).**

“Technology Spending’s Uncertain Payoff,”by **O’Sullivan, Orla (1998).**

“Web Offerings Lure Small Businesses,” by **Pizzani, Lori (1999).**

“Bank of America to Set Up An Online B-to-B Market,” by **Ptacek, Megan (2000a).**

‘Industry Structure:Electronic Delivery’s Potential Effects on Retail Banking,’by **Radecki, Lawrence J., John Wenninger, and Daniel K. Orlow (1997)**

“Home Banking Experiences User ‘Churn’,”by **Redman, Russell (1999).**

“Burgeoning Internet Enticed Deutsche, by **Rhoads, Christopher, and Erik Portanger (2000)**).

“Large Bank Retirement Services: A Comparative Practices Study,”by **Robertson, Douglas, Jim Cambruzzi, Kevin Jacques, Peter Nigro, Bill Pate, Hugh Rich, and Art Steele (2000)**).

“The future of finance,” December 11. by *The Economist* **(1999)**).

“Online surge blasts banks,”by **Timewell, Stephen and Kung Young (2000)**).

“Compubank, Failing to Excite Public, Eyes On-Line Service for Businesses,” by **Toonkel, Jessica (2000a)**).

“Business-to-Business Electronic Commerce,”by **Wenninger, John (1999)**).

“The Emerging Role of Banks in E-Commerce,” by **Wenninger, John (2000)**).

“Online Banks Going the Affinity Group Route,” by **Weitzman, Jennifer (2000)**).

“Small Banks Have Ambitious On-line Plans,” by **Winig, Eric (2000)**

“Online Banks Going the Affinity Group Route,” by **Weitzman, Jennifer (2000)**).

“Information Economy I,” by **Zandi, Mark M. (1999)**).

REFERENCES

[1.1] www.wikipedia.org

[1.2] Internet Banking, Developments and Prospects Karen Furst, William W. Lang,
and Daniel E. Nolle , September 2000

[2.1] www.wikipedia.org

[2.2] www.wikipedia.org

[7.1] www.wikipedia.org

[A.1] www.wikipedia.org

[A.2] Banking Basics ,Federal Reserve Bank Of Boston ,Ed 2007

[A.3] Internet Banking ,Comptrollers Handbook ,October1999

[A.4] Internet Banking ,Comptrollers Handbook ,October1999

[A.5] Internet Banking ,Comptrollers Handbook ,October1999

APPENDIX

APPENDIX A

Appendix A

ONLINE BANKING

A Online banking

Online banking (or **Internet banking** or **e banking**) is a term used for performing transactions, payments etc. over the Internet through a bank, credit union or building society's secure website. This allows customers to do their banking outside of bank hours and from anywhere where Internet access is available. In most cases a web browser is utilized and any normal Internet connection is suitable. No special software or hardware is usually needed.

A.1 History

One of the first organizations to set up on-line banking was the Nottingham Building Society in 1983. The system used was based on the UK's Prestel system and used a computer, such as the BBC Micro, or keyboard (Tandata TD1200) connected to the telephone system and television set. The system allowed on-line viewing of statements, bank transfers and bill payments. The Bank of Scotland introduced the system in 1985.

The Presidential Savings Bank notes that it was America's first on-line [internet] bank with a service starting on October 6, 1995

A.2 Features

“Online banking usually offers such features as:

- Bank statements, with the possibility to import data in a personal finance program such as Quicken or Microsoft Money
- Electronic bill presentment and payment - EBPP
- Funds transfer between a customer's own checking and savings accounts, or to another customer's account
- Investment purchase or sale
- Loan applications and transactions, such as repayments
- Account aggregation to allow the customers to monitor all of their accounts in one place whether they are with their main bank or with other institutions.

There are a growing number of so-called virtual banks that operate exclusively online. These online banks have low costs compared to traditional banks and so they often offer higher interest rates.

A.3 Security

Protection through single password authentication, as is the case in most secure Internet shopping sites, is not considered secure enough for personal online banking applications in some countries. Online banking user interfaces are secure sites (generally employing the https protocol) and traffic of all information - including the password - is encrypted, making it next to impossible for a third party to obtain or modify information after it is sent. However, encryption alone does not rule out the possibility of hackers gaining access to vulnerable home PCs and intercepting the password as it is typed in (keystroke logging). There is also the danger of password cracking and physical theft of passwords written down by careless users.

Many online banking services therefore impose a second layer of security. Strategies vary, but a common method is the use of transaction numbers, or TANs, which are essentially single use passwords. Another strategy is the use of two passwords, only random parts of which are entered at the start of every online banking session. This is however slightly less secure than the TAN alternative and more inconvenient for the user. A third option is providing customers with security token devices capable of generating single use passwords unique to the customer's token (this is called two-factor authentication or 2FA). Another option is using digital certificates, which digitally sign or authenticate the transactions, by linking them to the physical device (e.g. computer, mobile phone, etc). Other banks have responded not with security tokens or digital certificates, but by setting up a combination of controls that recognize a customer's computer, ask additional challenge questions for risky behavior, and monitor for fraudulent behavior.

I

A.4 Fraud

Some customers avoid online banking as they perceive it as being too vulnerable to fraud. The security measures employed by most banks can never be completely safe, but in practice the number of fraud victims due to online banking is very small. This is probably due to the fact that a relatively small number of people use Internet banking compared with the total number of banking customers world wide. Indeed, conventional banking practices may be more prone to abuse by fraudsters than online banking. Credit card fraud, signature forgery and identity theft are far more widespread "offline" crimes than malicious hacking. Bank transactions are generally traceable and criminal penalties for bank fraud are high. Online banking becomes less secure if users are careless, gullible or computer illiterate. An increasingly popular criminal practice to gain access to a user's finances is phishing, whereby the user is in some way persuaded to hand over their password(s) to a fraudster.”[A.1]

Banking Basics

A.5 What is a bank?

“A bank is a business. But unlike some businesses, banks don’t manufacture products or extract natural resources from the earth. Banks sell financial services such as car loans, home mortgage loans, business loans, checking accounts, credit card services, certificates of deposit, and individual retirement accounts. Some people go to banks in search of a safe place to keep their money. Others are seeking to borrow money to buy a house or a car, start a business, expand a farm, pay for college, or do other things that require borrowing money.

Where do banks get the money to lend? They get it from people who open accounts. Banks act as go-betweens for people who save and people who want to borrow. If savers didn’t put their money in banks, the banks would have little or no money to lend.

Your savings are combined with the savings of others to form a big pool of money, and the bank uses that money to make loans. The money doesn’t belong to the bank’s president, board of directors, or stockholders. It belongs to you and the other depositors. That’s why bankers have a special obligation not to take big risks when they make loans.

A.6 Why are there so many different types of banks?

Not all banks are exactly the same. There are commercial banks, savings banks, savings and loan associations (S&Ls), cooperative banks, and credit unions. Today they offer many of the same services, but at one time, they were very different from one another.

A.6. 1 Commercial banks originally concentrated on meeting the needs of businesses. They served as places where a business could safely deposit its funds or borrow money when necessary.

Many commercial banks also made loans and offered accounts to individuals, but they put most of their effort into serving business (commercial) customers.

2.6.2 Savings banks, S&Ls, cooperative banks, and credit unions are classified as thrift institutions or “thrifts,” rather than banks. Originally, they concentrated on serving people whose banking needs were ignored or unmet by commercial banks.

The first savings banks were founded in the early 1800s to give blue-collar workers, clerks, and domestic workers a secure place to save for a “rainy day.” They were started by public spirited citizens who wanted to encourage efforts at saving among people who did not earn much money.

Savings and loan associations and cooperative banks were established during the 1800s to help factory workers and other wage earners become homeowners. S&Ls accepted savings deposits and used the money to make loans to home buyers. Most of the loans went to people who did not make enough money to be welcome at traditional banks.

2.6.3 Credit unions began as a 19th-century solution to the emergency needs of people who were unable to borrow money from traditional lenders. Before the opening of credit unions, ordinary citizens had no place to turn when they faced unexpected home repairs, medical expenses, or other emergencies. Credit unions were started by people who shared a common bond such as working in the same factory, belonging to the same house of worship, or farming in the same community. Members pooled their savings and used the money to make small loans to one another. Although there are still differences between banks and thrifts, they now offer many of the same banking services to their customers. Most commercial banks now compete to make car loans. Many thrift institutions have begun to make commercial loans, and some credit unions make loans to home buyers.

A.7 How do I choose a bank?

1. Does your bank pay depositors a competitive interest rate?
2. Is the bank in a convenient location and are its business hours convenient for you?
3. Is your deposit insured by the FDIC (Federal Deposit Insurance Corporation)?
4. Is the bank a good corporate citizen? Does it invest in your neighborhood?
5. And last, but certainly not least, does your bank provide courteous and efficient service?

Before you open an account, ask a few people if they are happy with their bank. And do some comparison shopping because all banks are not the same.

A.8 What types of accounts do banks offer?

People use banks for different purposes. Some have extra money to save; others need to borrow. Some need to manage their household finances; others need to manage a business.

Banks help their customers meet those needs by offering a variety of accounts.

A.8.1 Savings accounts are for people who want to keep their money in a safe place and earn interest at the same time. You don't need a lot of money to open a savings account, and you can withdraw your money easily.

A.8.2 Certificates of deposit (CDs) are savings deposits that require you to keep a certain amount of money in the bank for a fixed period of time (example: \$1,000 for two years). As a rule, you earn a higher rate of interest if you agree to keep your money on deposit longer, and there is usually a penalty if you withdraw your money early.

A.8.3 Individual retirement accounts (IRAs) are savings deposits that offer an excellent way to save for your later years. You don't have to pay tax on the money you deposit in your IRA until you withdraw it. But there is often a significant penalty if you withdraw your funds before you reach a specified age (usually 59 or older).

A.8.4 Checking accounts offer safety and convenience. You keep your money in the account and write a check when you want to pay a bill or transfer some of your money to someone else.

If your checkbook is lost or stolen, all you need to do is close your account and open a new one so that nobody can use your old checks. (When cash is lost or stolen, you rarely see it again.) Another attractive feature of a checking account is that your bank sends you a monthly record of the checks you have written, and you can use that record if ever need to prove that you've made a payment. Banks sometimes charge a fee for checking accounts, because check processing is costly.

Finally, banks do not always call their accounts by the same names. Often, they choose distinctive names in hopes of attracting customers. But there can be a real difference between one bank's accounts and another's, so shop around.

A.9 What happens to money after you deposit it?

What happens to a Rs10 bill after you deposit it in your savings account? Does the bank teller take it to a vault and put it into a separate compartment or cubbyhole marked with your name and account number? No.

The bank begins by adding Rs10 to the amount that is already in your account (your existing balance). Your Rs10 deposit and your new balance are then recorded in your bank book and in the bank's computer system. The Rs10 bill you deposited is mixed in with all the other cash your bank receives that day. When you and other customers deposit money in a bank, the bank "puts most of it to work."

Part of the money is set aside and held in reserve, but much of the rest is loaned to people who need to borrow money in order to buy a house or a car, expand a business, buy farm equipment, or do any of the other things that require people to borrow money.

Of course, banks do not lend money just to provide a service. They do it to make money.

Here's how it works.

When you keep your savings in a bank, the bank pays you extra money, which is called interest.

The interest is added to your account on a regular basis, usually once a month. Let's say a bank pays its depositors interest of 3 percent a year on their savings. In simple terms, that means if you keep Rs100 in your savings account, the bank will add Rs 3 to your account balance during the course of a year.

1But, there is another side to interest. When someone borrows money from a bank, the bank charges interest, and it charges borrowers a higher rate than it pays savers. For example, it might pay savers 3 percent and charge borrowers 8 percent. The difference, 8 percent minus 3 percent, goes to the bank. Charging interest on loans is one of the main ways for a bank to make money.

The rate of interest a bank charges depends largely on two things:

- How many people want to borrow money, and
- How much money banks have available to lend.

If a bank has plenty of money to lend, and the demand to borrow money is not particularly strong, interest rates will tend to be low in order to attract borrowers. But when banks have a smaller amount of money to lend, and the demand to borrow is fairly strong, interest rates will rise. As a depositor, you want interest rates to be high, but as a borrower, you want them to be low.

When it comes to paying interest on savings deposits, there usually isn't a big difference between banks. They pay just enough to stay competitive with one another and attract depositors. So, if one bank is offering a much better (higher) rate than most other banks, try to find out why. And remember the old saying: If something sounds too good to be true, it probably is.

A.10 What happens when you apply for a loan?

Last week your mechanic advised you not to spend any more money on the faithful old car that has carried you over many miles of highway. The time has come to shop around for a new one. But cars were a lot cheaper when you last bought one. This time you'll have to take out a big loan.

You don't necessarily have to borrow from the bank where you have an account. You should shop around for a lender that offers the best deal, including the lowest interest rate. Sometimes car companies offer low-interest, or even no-interest loans. And don't forget the internet. You can research a wealth of online resources from the comfort of your home or office.

Your first step is to figure out how much you can afford to borrow. You will not know if you can afford the new car—or if a lender will let you borrow the amount want—until after you complete a loan application. In addition to routine personal information such as your name, address, telephone number, and Social Security number, a loan application also asks for information on how much

money you earn, how long you have worked at your current job, and how much money you already owe on credit card bills and other debts.

The next step is for the lender to evaluate your application and decide if you are a “good risk.”

Before they lend you money, lenders want to be as certain as possible that you will be able to pay them back. Do you earn enough money to keep up with your loan payments? Do you have a history of paying your debts on time? To answer these questions, lenders rely heavily on credit bureaus and credit reports. All are private companies (not government agencies), and most are linked by computer to three nationwide credit bureaus. They provide much of the information that lenders need to evaluate loan applications.

When you apply for a loan, your bank contacts a credit bureau and asks for a copy of your credit report, which is basically a summary of your payment habits—information about loans, charge accounts, credit card accounts, bankruptcies, and court judgments that might require a potential borrower to pay a large sum of money as a settlement. How the information gets into your credit report is no mystery. When you apply for a new charge account or credit card, clerks transfer information from your application to electronic records that are forwarded to one or more of the nationwide credit bureaus. If you are late in paying your bills, or if you miss a payment, the information goes into your credit report. Lenders then evaluate your report and try to decide if you are a “good risk.”

After weighing all the information, your bank will either approve or deny your loan request.

If your request is denied, the bank must notify you in writing within 30 days, and the letter must state the reason for denying your loan. If your loan is approved, the bank will give you a check made out to your auto dealer or transfer the funds to your account. To protect itself in case you fail to repay the loan, your bank will hold the legal title (ownership papers) to your purchase until you pay off the loan.

Before applying for a loan, you should request a copy of your credit report. If there are any issues or questions, you may be able to address them before processing a loan application. You are entitled to a free copy of your credit report, at your request, once every 12 months.

A.11 What are checks, and how do they work?

You reach for your wallet and it's not there. Panic gives way to despair when you realize that your wallet is gone and so is your cash. Chances are you'll never see the cash again.

The consequences are not nearly as serious if you lose your checkbook. All you do in that case is close your checking account and open a new one. After that, your lost or stolen checks are worthless to anyone who might try to use them. Because they are safe and convenient, checks have become a popular method of paying for things or transferring money. But what exactly is a check?

In simple terms, a check is a written set of instructions to your bank. When you write a check, you are instructing your bank to transfer a specific amount of money from your checking account to another person or an organization. You can even write a check to convert some of the money on deposit in your checking account into cash.

When you fill in the blank spaces on one of your checks, you are telling your bank three things:

- 1) How much of your money you want to transfer,
- 2) When you want to transfer it, and
- 3) To whom you want it to go.

You authorize the transfer by signing the check.

So, if your favorite aunt sends you a RS 50 check for your birthday, she's actually telling her bank to transfer Rs 50 from her account to you. But when you go to cash her check or deposit it in your account, how does your bank know if your aunt actually has enough money in her account to cover the check?

The answer to this question isn't what it used to be.

Up until 2004, the check had to travel all the way back to your aunt's bank by truck or by plane.

If there was enough money in her account to cover it, her bank would "clear" the check. If there wasn't enough, her bank would stamp it "NSF"—Not Sufficient Funds—and "bounce" it back to your bank. And on top of all that, your aunt's bank had to send her cancelled checks back to her every month, along with her account statement.

As checks became more popular, banks spent more and more time and money moving billions of pieces of paper around the country each year—not the best use of resources, especially when new technology offered a more efficient way to do things.

In 2004, Check 21 went into effect. The new federal law made it possible for banks to handle more checks electronically. Instead of physically moving checks from one bank to another, banks can now electronically transmit images of the checks they process. It's a lot faster and less costly.

A.12 Credit cards, debit cards, stored value cards:

What's the difference?

Credit cards are not a form of money, even though people often refer to them as “plastic money.” When you use a credit card you are actually taking out a loan—buying something now and agreeing to pay for it later—and sooner or later you will have to pay the bill for all those things you’ve bought.

Many banks issue credit cards, even to people who aren’t regular customers. Before issuing you a credit card, a bank will require you to complete an application form and will examine your credit record to see if you have a history of paying back your debts on time.

Sometimes people run up credit card bills that are too big to pay off every month. When that happens, they must pay a monthly finance charge that can sometimes top 20 percent a year.

In addition, banks (and other companies that issue credit cards) sometimes charge their cardholders an annual fee. They also charge merchants a fee for making the credit card service available. Finance charges, annual fees, and merchant fees have become an important source of income for banks.

Debit cards look like credit cards, but they are very different. When you use a debit card at the gas pump or at a store, the amount of the purchase is electronically deducted from your bank balance. It will show up on your monthly bank statement, but there’s no monthly bill because the amount of each purchase is deducted almost immediately from your account.

You can also use your debit card at an ATM if you need to withdraw cash from your account, but if the ATM is not part of your bank’s network, you may have to pay a fee.

One other major difference between debit cards and credit cards is that you don't have as much legal protection if your debit card is lost or stolen. On a lost or stolen credit card, the most you're responsible for is Rs 50. But if someone steals your debit card, you could be responsible for up to Rs 500 in fraudulent charges or transfers unless you report the loss or theft of your card within two business days. You risk unlimited loss if an unauthorized charge or withdrawal appears on your statement, and you don't report it within 60 days. So always be sure to check your monthly bank statements!

A.13 What is electronic banking?

The bank closes in ten minutes. Even if you make it there in time to cash your check, your nerves will be frazzled. Isn't there an easier way?

Yes, there is. Electronics and computers have turned banking into a round-the-clock business. Automated teller machines (ATMs) now make it possible for you to do much of your banking whenever you choose.

ATMs are computers that are much like limited-service bank branches. You can use them to make a withdrawal, make a deposit, make a loan payment, transfer money from one account to another, or check your account balance. In many cases, automated teller machines of different banks are linked together in networks so you can use them when you travel to a different part of town, another state, or even another country. All you need is a plastic card from your bank and your own password.

Another electronic banking service is called electronic funds transfer, or EFT. By using EFT, a bank can transfer large amounts of money to another bank by sending an electronic message.

Electronic transfers take only an instant. An electronic message instructs a computer to deduct a certain amount of money from one bank account and then add the same amount to another bank account. The message is sent, and the appropriate amount is transferred. No cash or paper changes hands, but money is transferred just the same.

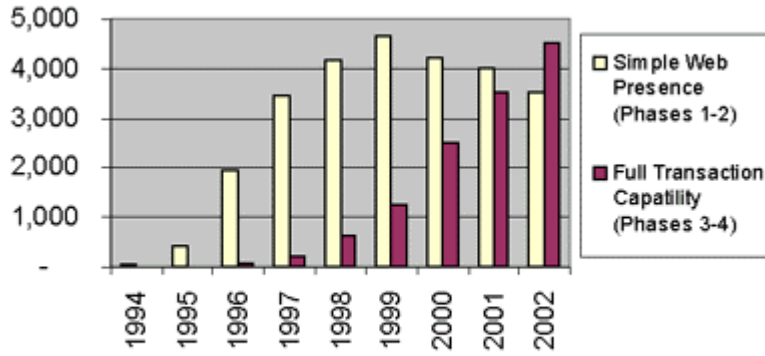
Technology has made it possible to bank from the comfort of your own home.

Banks offer

software packages that allow customers to debit or credit their accounts, check their account balances, or even apply for a loan. Consumers can make these transactions online.

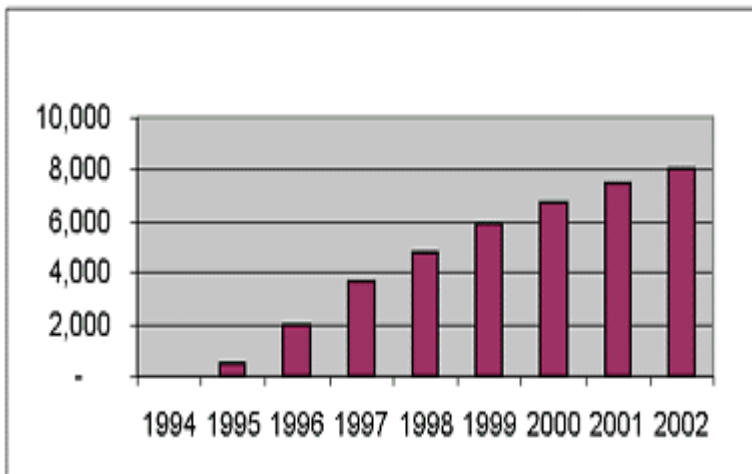
There are even “virtual banks” that have no physical bank office in a traditional way. They provide all of their services to their customers over the internet.”[A.2]

Types of Online Consumer Banking Sites



Source: Online Banking Report, January 1998; modified

Number of Banks with Web Sites



[Source: Online Banking Report, January 1998]

A.14 Internet Banking

““Internet banking” refers to systems that enable bank customers to access accounts and general information on bank products and services through a personal computer (PC) or other intelligent device.

Internet banking products and services can include wholesale products for corporate customers as well as retail and fiduciary products for consumers. Ultimately, the products and services obtained through Internet banking may mirror products and services offered through other bank delivery channels. Some examples of wholesale products and services include:

- Cash management.
- Wire transfer.
- Automated clearinghouse (ACH) transactions.
- Bill presentment and payment.

Examples of retail and fiduciary products and services include:

- Balance inquiry.
- Funds transfer.
- Downloading transaction information.
- Bill presentment and payment.
- Loan applications.
- Investment activity.
- Other value-added services.”[A.3]

A.15 Types of Internet Banking

“Understanding the various types of Internet banking products will help examiners assess the risks involved. Currently, the following three basic kinds of Internet banking are being employed in the marketplace:

- **Informational** — This is the basic level of Internet banking. Typically, the bank has marketing information about the bank’s products and services on a stand-alone server. The risk is relatively low, as informational systems typically have no path between the server and the bank’s internal network. This level of Internet banking can be provided by the bank or outsourced. While the risk to a bank is relatively low, the server or Web site may be vulnerable to alteration. Appropriate controls therefore must be in place to prevent unauthorized alterations to the bank’s server or Web site.
- **Communicative** — This type of Internet banking system allows some interaction between the bank’s systems and the customer. The interaction may be limited to electronic mail, account inquiry, loan applications, or static file updates (name and address changes). Because these servers may have a path to the bank’s internal networks, the risk is higher with this configuration than with informational systems.

Appropriate controls need to be in place to prevent, monitor, and alert management of any unauthorized attempt to access the bank’s internal networks and computer systems. Virus controls also become much more critical in this environment. MY project is communicative .

- **Transactional** — This level of Internet banking allows customers to execute transactions. Since a path typically exists between the server and

the bank's or outsourcer's internal network, this is the highest risk architecture and must have the strongest controls. Customer transactions can include accessing accounts, paying bills, transferring funds, etc.”[A.4]

A.16 Issues in Internet Banking

“Financial institutions, their card associations, and vendors are working to develop an Internet payment infrastructure to help make electronic commerce secure. Many in the banking industry expect significant growth in the use of the Internet for the purchase of goods and services and electronic data interchange. The banking industry also recognizes that the Internet must be secure to achieve a high level of confidence with both consumers and businesses.

Sound management of banking products and services, especially those provided over the Internet, is fundamental to maintaining a high level of public confidence not only in the individual bank and its brand name but also in the banking system as a whole. Key components that will help maintain a high level of public confidence in an open network environment include:

- Security
- Authentication
- Trust
- Nonrepudiation
- Privacy
- Availability

- **Security** is an issue in Internet banking systems. The OCC expects national banks to provide a level of logical and physical security commensurate with the sensitivity of the information and the individual bank's risk tolerance. Some national banks allow for direct dial-in access to their systems over a private network while others provide network access through the Internet.

Although the publicly accessible Internet generally may be less secure, both types of connections are vulnerable to interception and alteration. For example, hardware or software "sniffers" can obtain passwords, account numbers, credit card numbers, etc. without regard to the means of access.

Firewalls are frequently used on Internet banking systems as a security measure to protect internal systems and should be considered for any system connected to an outside network. Firewalls are a combination of hardware and software placed between two networks through which all traffic must pass, regardless of the direction of flow. They provide a gateway to guard against unauthorized individuals gaining access to the bank's network. The mere presence of a firewall does not assure logical security and firewalls are not impenetrable: firewalls must be configured to meet a specific operating environment and they must be evaluated and maintained on a regular basis to assure their effectiveness and efficiency. Individuals who are technically competent must perform the installation, configuration, evaluation, and maintenance of firewalls. The specific risks involved may require a broad range of security controls.

- **Authentication** is another issue in a Internet banking system. Transactions on the Internet or any other telecommunication network must be secure to achieve a high level of public confidence. Banks typically use symmetric (private key) encryption technology to secure messages and asymmetric (public/private key) cryptography to authenticate parties. Asymmetric cryptography employs two keys — a public key and a private key. These two keys are mathematically tied but one key cannot be deduced from the other. For example, to authenticate that a message came from the sender, the sender encrypts the message using their private key. Only the sender knows the private key. But, once sent, the message can be read only using the sender's public key. Since the message can only be read using the sender's public key, the receiver knows the message came from the expected sender.

Internet banking systems should employ a level of encryption that is appropriate to the level of risk present in the systems.

A common asymmetric cryptography system is RSA, which uses key lengths up to 1,024 bits. By using the two forms of cryptography together, symmetric to protect the message and asymmetric to authenticate the parties involved, banks can secure the message and have a high level of confidence in the identity of the parties involved.

Biometric devices are an advanced form of authentication. These devices may take the form of a retina scan, finger or thumb print scan, facial scan, or voice print scan. Use of biometrics is not yet considered mainstream, but may be used by some banks for authentication. Examiners should evaluate biometric activities based on management's understanding of risks, internal or external reviews, and the overall performance of these devices.

- **Trust** is another issue in Internet banking systems. Public and private key cryptographic systems can be used to secure information and authenticate

parties in transactions in cyberspace. A trusted third party is a necessary part of the process. That third party is the **certificate authority**.

A certificate authority is a trusted third party that verifies identities in cyberspace. Some people think of the certificate authority functioning like an online notary. The basic concept is that a bank, or other third party, uses its good name to validate parties in transactions.. Banks will have to guard against a variety of frauds and scams as banking on the Internet becomes more prominent. Digital certificates may play an important role in authenticating parties and thus establishing trust in Internet banking systems.

- **Nonrepudiation** is the undeniable proof of participation by both the sender and receiver in a transaction. It is the reason public key encryption was developed, i.e., to authenticate electronic messages and prevent denial or repudiation by the sender or receiver
- **Privacy** is a consumer issue of increasing importance. National banks that recognize and respond to privacy issues in a proactive way make this a positive attribute for the bank and a benefit for its customers. Public concerns over the proper versus improper accumulation and use of personal information are likely to increase with the continued growth of.

- **Availability** is another component in maintaining a high level of public confidence in a network environment. All of the previous components are of little value if the network is not available and convenient to customers. Users of a network expect access to systems 24 hours per day, seven days a week.

Among the considerations associated with system availability are capacity, performance monitoring, redundancy, and business resumption..

In addition, performance monitoring techniques will provide management with information such as the volume of traffic, the duration of transactions, and the amount of time customers must wait for service. Monitoring capacity, downtime, and performance on a regular basis will help management assure a high level of availability for their Internet banking system. It is also important to evaluate network vulnerabilities to prevent outages due to component failures. An entire network can become inoperable when a single hardware component or software module malfunctions. “[A.5]

APPENDIX B

USER MANUAL

USER MANUAL

Front End View

The front end view of my web application is as below. Home Menu is in the center. The Menu includes:

- Menu
- Calculators
- Notifications
- Apply For
- Stop Payment
- CR Services
- Calendar
- Time
- News Manager
- Online Banking Instructions

Calendar

On the right side of the main view, there is a calendar which displays current date.

Time

On the top right side of the main view, there is a digital clock displaying current time.

News Manager

On the right side of the main view, there is news scroller displaying current news.

Online Banking Instructions

In the middle of front view, there are instructions and faq about online banking. Click next to view whole faq.

B 1 Menu

These Tabs are further classified into following modules

- Menu
 - Login
 - Email Anywhere

Login:

This tab takes to the login page. The login page asks for pin code/email address from the customer. After login the customer can view his own Accounts Detail Page. On clicking the Accounts Detail Button clients own accounts will be displayed. The accounts detail page will show

- Account Name
- Transaction
- Credit
- Debit
- Date
- Balance.

Below the page there are 2 buttons.

- Home button will log off the user and take the user to home page
- Menu button will take the user to the main users personalized page.

Email Anywhere

On clicking this tab the user will be sent to an email form, which the user can fill to send anywhere.

Demo

The demo button will display demo made in flash. The demo explains how to use the tabs and which button displays what page.

B2 -Calculators

On clicking the Calculators tab, the menu gives us 4 modules

- Simple Calculator
- Loan Calculator
- Currency Converter
- Currency Finder

Simple Calculator

Clicking this tab takes the user to calculator page. The user can do the air thematic and return to the home page.

Loan Calculator

Clicking this tab the user to Loan calculator page. Here the user will write Loan Amount,% rate, Payments in years ,number of payments in years. And will get amount per payment, total interest rate.

Currency Converter

Clicking this tab will take the user to the currency converter page, where the user can select the country of which and from which he wants to convert money from.

Currency Finder

Clicking the tab will take the user to currency finder page. Where the user can select the country of which he wants to view its currency.

B3 Notifications

This tab is classified into further 3 tabs.

- Cleared check
- Balance
- Cards

Cleared Check

This option takes the user to a form where the user will fill the form. The user will write the account name, check number and email address to receive an alert when the specific single check is cleared from specific account.

Balance

This option the user will the form including account name ,specific amount as a range whether the amount is greater or less then the amount entered and email address to receive this alert message. This alert will be sent if the balance reaches below or higher than the amount entered.

Cards

This option will take the user to a form in which he will have to fill the card name , email address and amount .I f the credit/atm card reaches this amount or less than this amount ,the user will receive email notification.

B4 Apply For

The user can apply for various services by clicking this tab.

- Apply for loan
- Apply for cards
- Apply for new account

Apply For Loan

By clicking this tab, the user gets to fill the loan application. In this form user have to write account name, type of loan and email address. If the bank found your account, then the required information of the type of loan will be send to you by email.

Apply For Cards

By clicking this tab, the user gets to fill the cards application. The users have to write the account name, type of card (atm or credit) and email address. After processing of the application, the user will receive the card at home.

Apply For New Account

By Clicking this tab, the user can apply for new account. The user have to write the accounts name, type minimum balance and email address. If the user has an account in the bank, minimum amount will be deducted from old account to new account.

B5 Stop Payment

This module is classified into 3 parts

- Single check
- Multiple checks
- Cards

Single Check

By clicking this module, the user fills the form to stop payment of single check. The client have to write the account name,comment,check number, check amount, payee name and date. Payment will be stopped through that check.

Multiple Check

Through this muddle the user can stop multiple checks payments. He has to write only account name and checks sequence numbers.

Cards

This module can stop payment of specific card. The user has to write just the account name, card type and email address.

B6 Customer Related Services.

This module is composed of 3 major modules.

- Email Us
- Live Help
- Discussion Forum

Email Us

This is a contact form. By clicking this button Microsoft Outlook will be opened at client side to write email.

Live Help

By clicking this button a chatting application will be opened. The user will have to write his nick name and join the chat room for live Bank help.

Discussion Forum

By clicking this button, the user will enter a forum where he can post messages and view messages. This is also a live facility for customers.

APPENDIX C

INSTALLATION

C1 Hardware Requirements

The minimum hardware requirements are:

- Pentium IV
- SVGA Card
- 28.8 kbps Modem
- 20 GB Hard Disk
- 126 Mb Disk Space

C2 Software Requirements

The soft wares installed during this project are listed below.

- Windows, 98,Me,XP,2000,2000 Server
- Microsoft Internet Information Services,Personal webs Server
- Microsoft Internet Explorer
- Adobe Acrobat
- Macromedia Dreamweavor
- Macromedia Flash
- Flash 4 D
- A4 Desk
- News Scroller wizard
- Nav Studio 2005

C3 Software for clients

The following soft wares are necessary on client side

- Microsoft Internet Explorer
- 28.8KBS Modem for Internet Connectivity
- Macromedia Flash

C4 Web Hosting Services

Following web hosting services providers have above mentioned facilities. Details are on their websites.

Topnet	www.topnet.com.pk
Comsats	www.comsats.net.pk

C5 Internet Connection

At least 33.6 Kbps dialup Internet connection. 56 K/V.90 connectivity recommended

APPENDIX D

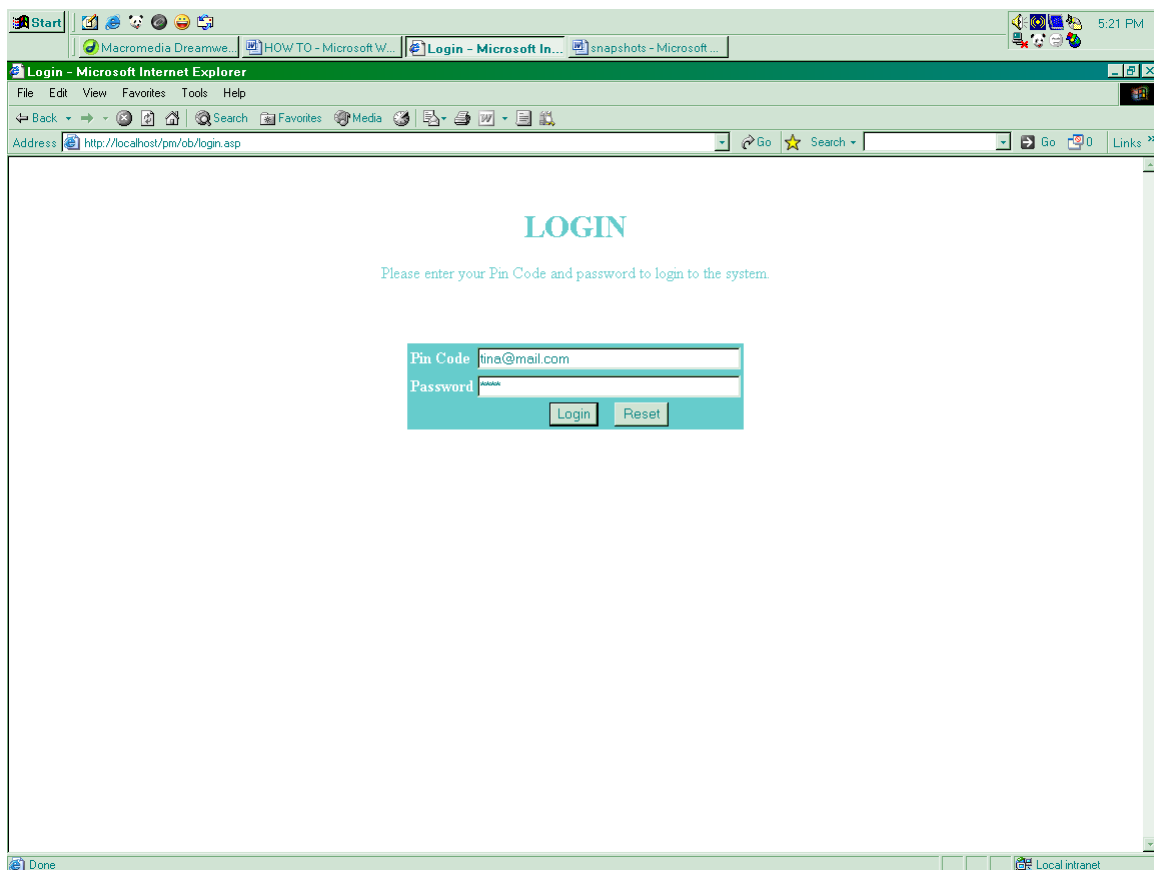
**TESTING
SNAPSHOTS**

Main View

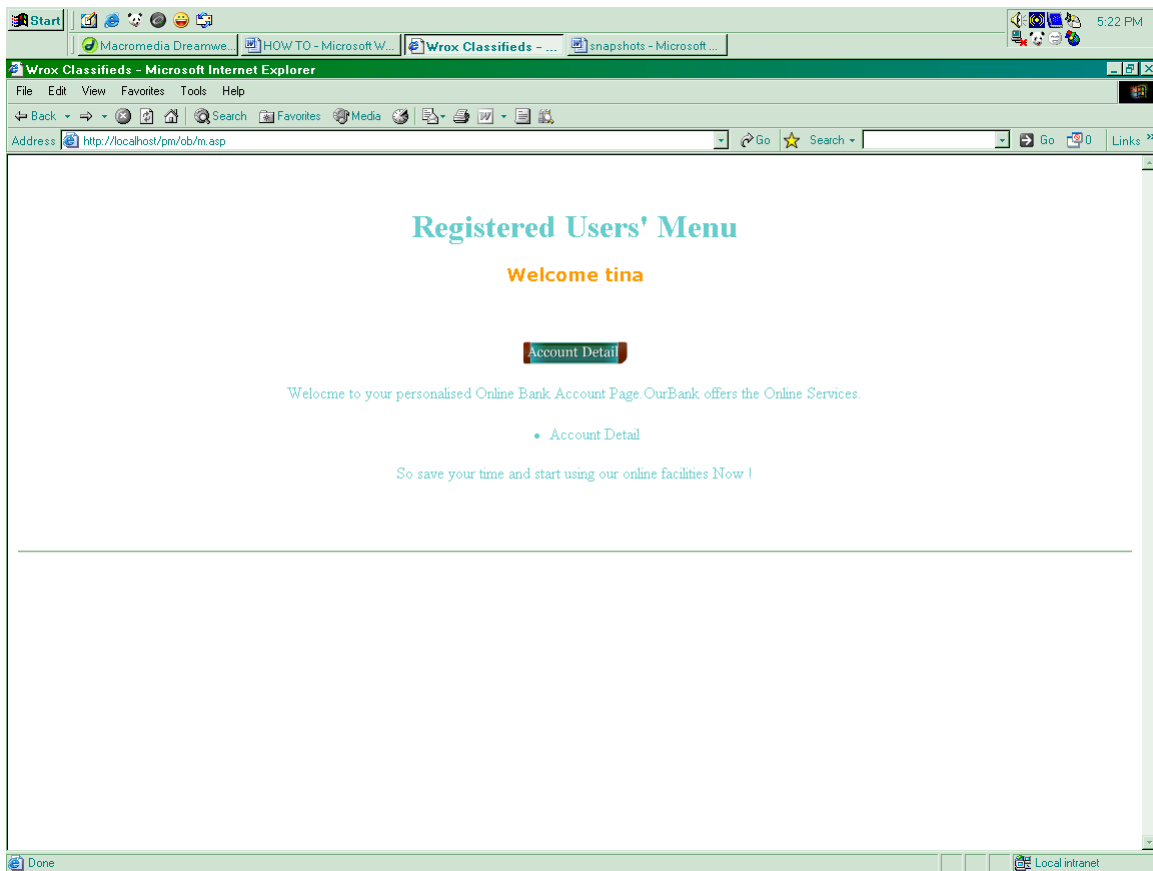
MENU

Login

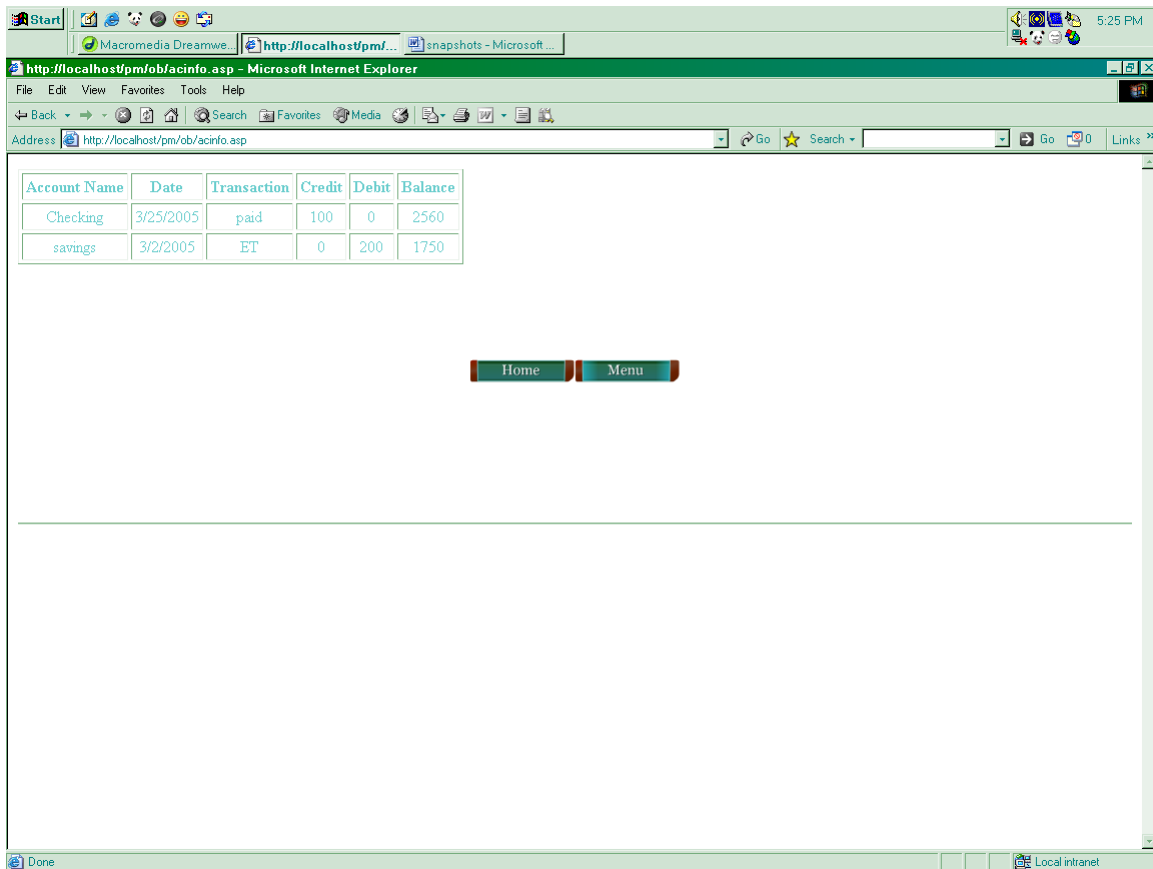
By clicking the login button, we open login page. Here the customer enter his email address (PIN CODE) and password. Click Login to enter the personalized page.



This is each customer's personalized page. Click on Account Detail button to view your accounts.

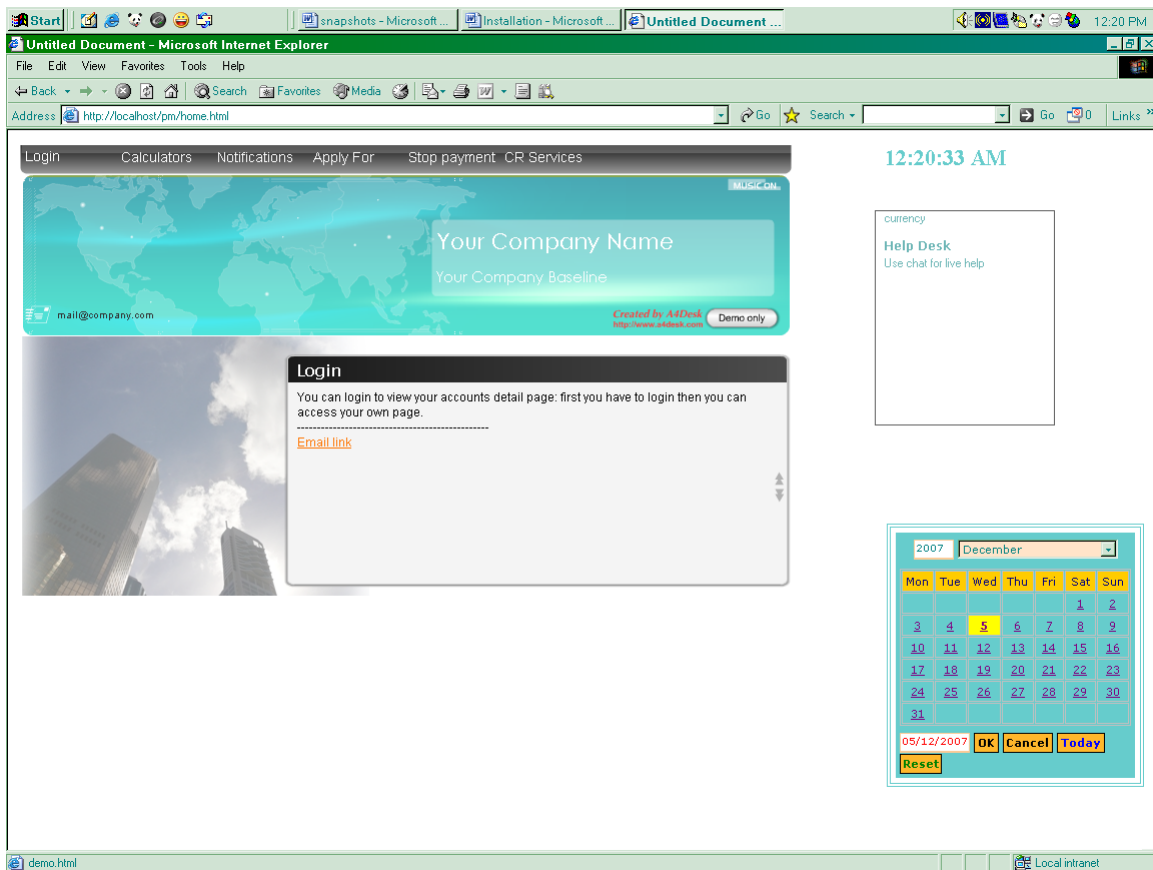


We will reach a page where each customer can view his Accounts, Date of transaction, transaction Type, Credit ,Debit and remaining Balance.

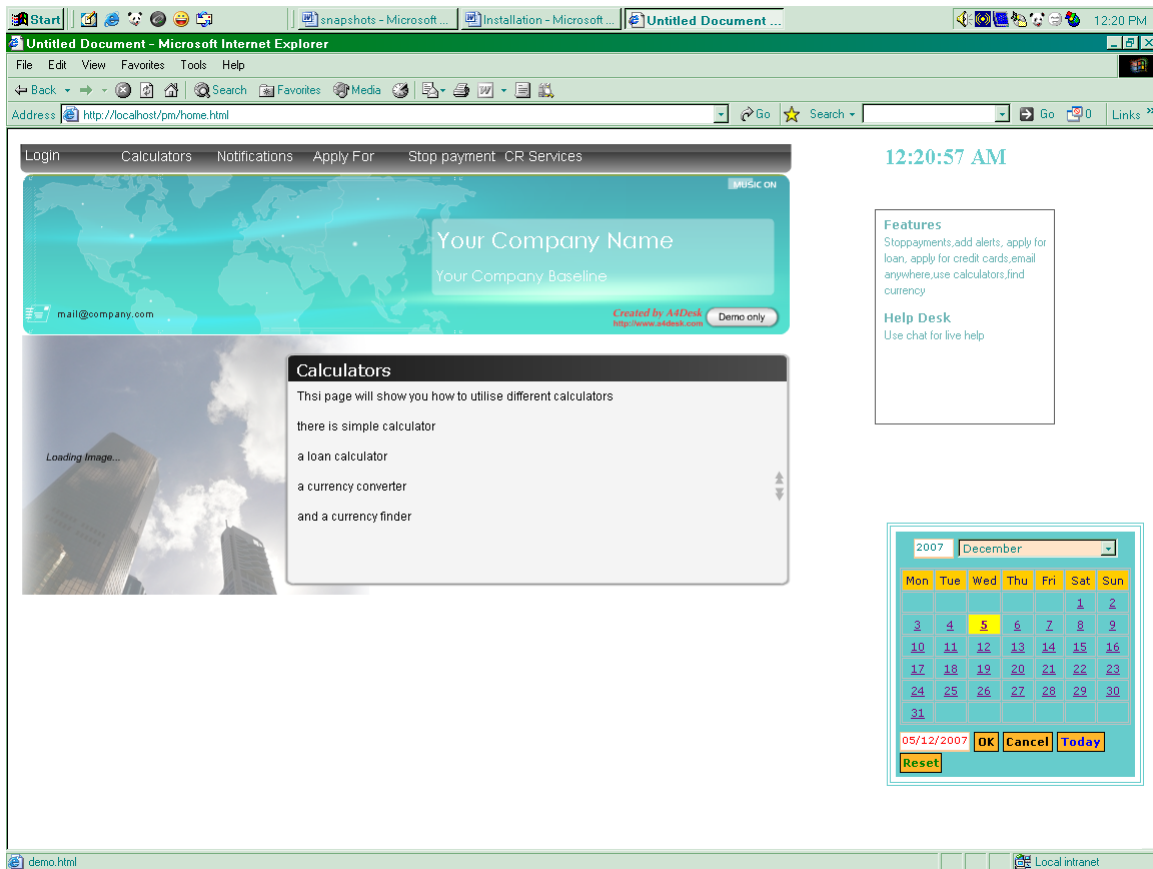


Demo

On clicking this button, the user will be taken to bank's demo. This demo is made in flash and will help the user what the other buttons on the main page do. On clicking each button the user will see a guide in the middle of the page explaining what he get by clicking buttons on the main page.

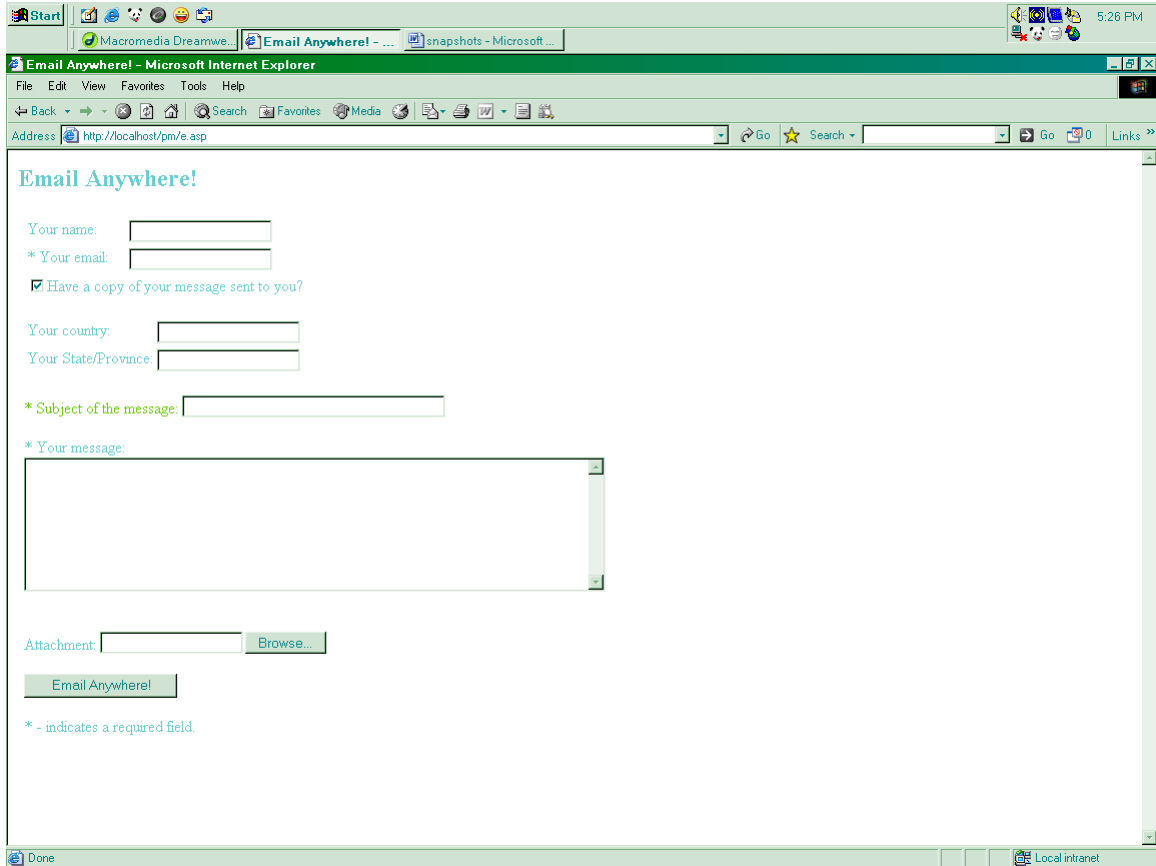


For Example on clicking the calculator's button. The guide will display that this tab contains 4 applications. Simple calculator, loan calculator, currency finder and currency converter.



Email Anywhere

By clicking this button, we will reach a page from where we can write text and send anywhere.



The screenshot shows a Microsoft Internet Explorer browser window displaying a web form titled "Email Anywhere!". The browser's address bar shows the URL "http://localhost/pin/e.asp". The form contains the following fields and elements:

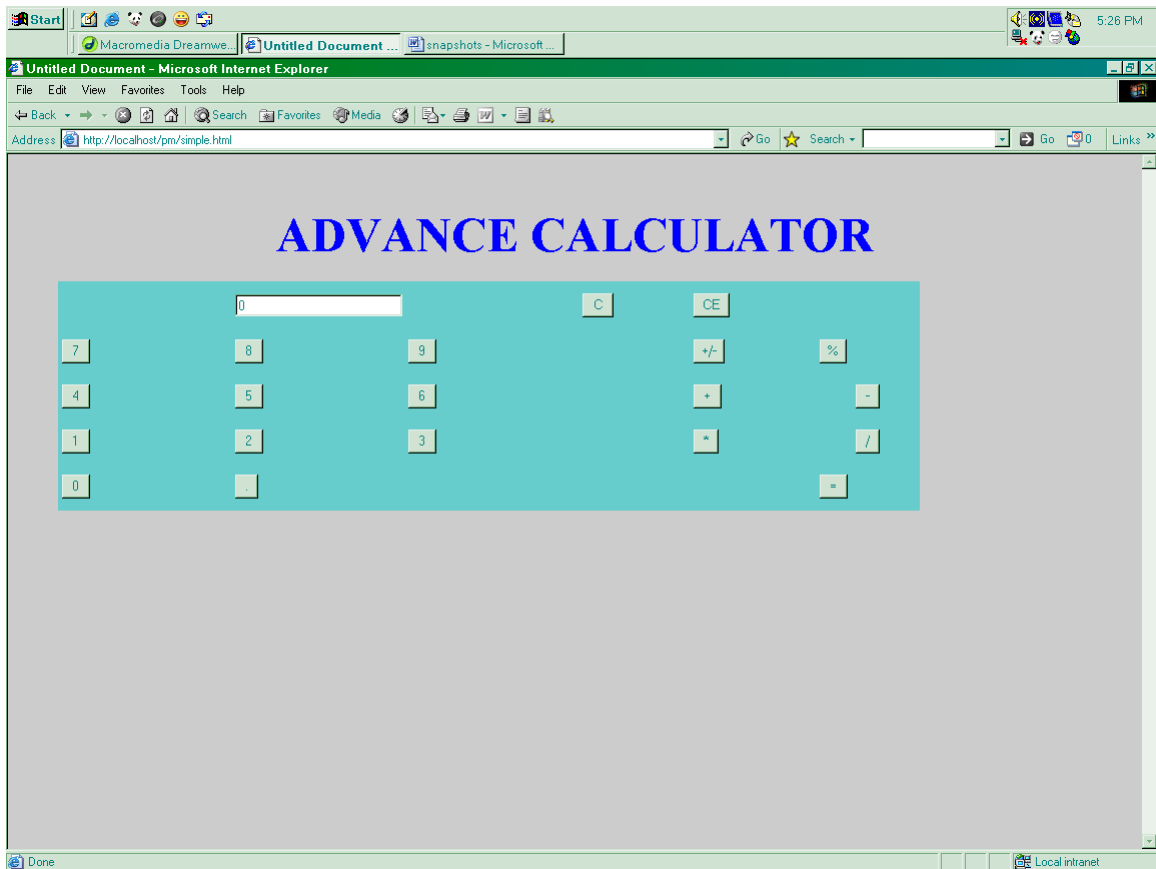
- Your name:** A text input field.
- * Your email:** A text input field, with an asterisk indicating it is a required field.
- Have a copy of your message sent to you?**
- Your country:** A text input field.
- Your State/Province:** A text input field.
- * Subject of the message:** A text input field, with an asterisk indicating it is a required field.
- * Your message:** A large text area for composing the message, with an asterisk indicating it is a required field.
- Attachment:** A text input field followed by a "Browse..." button.
- Email Anywhere!** A button to submit the form.
- * - indicates a required field.

The browser's status bar at the bottom shows "Done" and "Local intranet".

Calculators

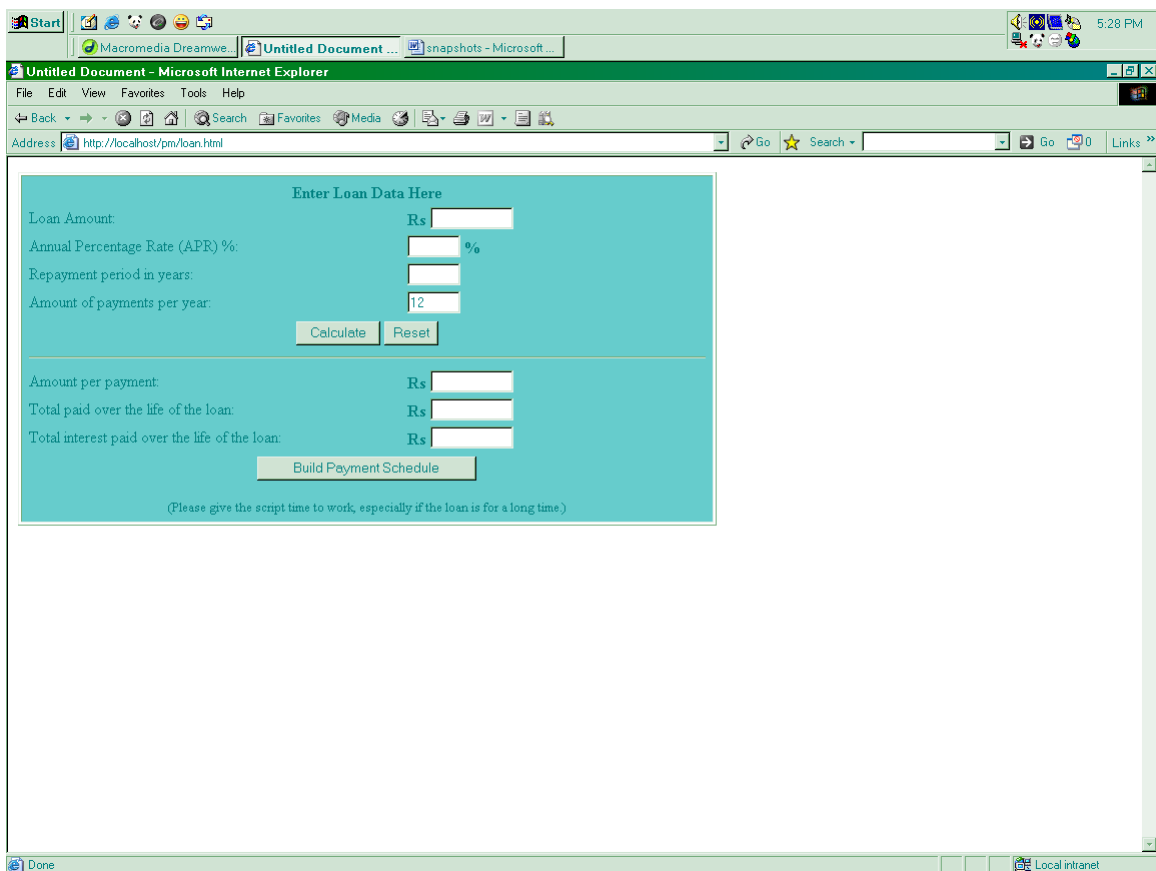
Simple

Clicking this button will take the user to a simple calculator where he can perform arithmetic operations.



Loan Calculator

Clicking this button will take the user to loan calculator where he will write loan amount and will receive monthly installments with interest.

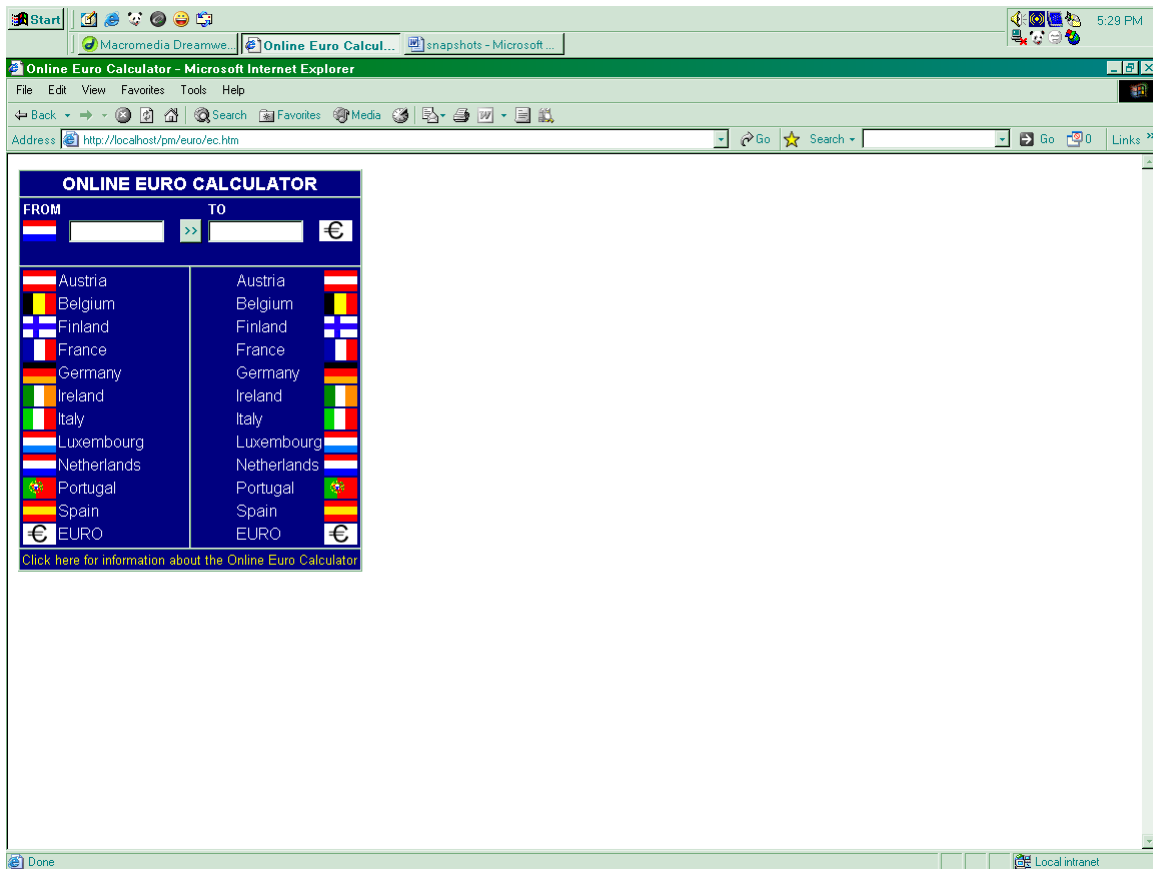


The screenshot shows a Microsoft Internet Explorer browser window displaying a loan calculator. The browser's address bar shows the URL `http://localhost/pn/loan.html`. The calculator interface is titled "Enter Loan Data Here" and contains the following fields and buttons:

- Loan Amount: Rs
- Annual Percentage Rate (APR) %: %
- Repayment period in years:
- Amount of payments per year:
- Buttons: Calculate, Reset
- Amount per payment: Rs
- Total paid over the life of the loan: Rs
- Total interest paid over the life of the loan: Rs
- Button: Build Payment Schedule
- Footnote: (Please give the script time to work, especially if the loan is for a long time.)

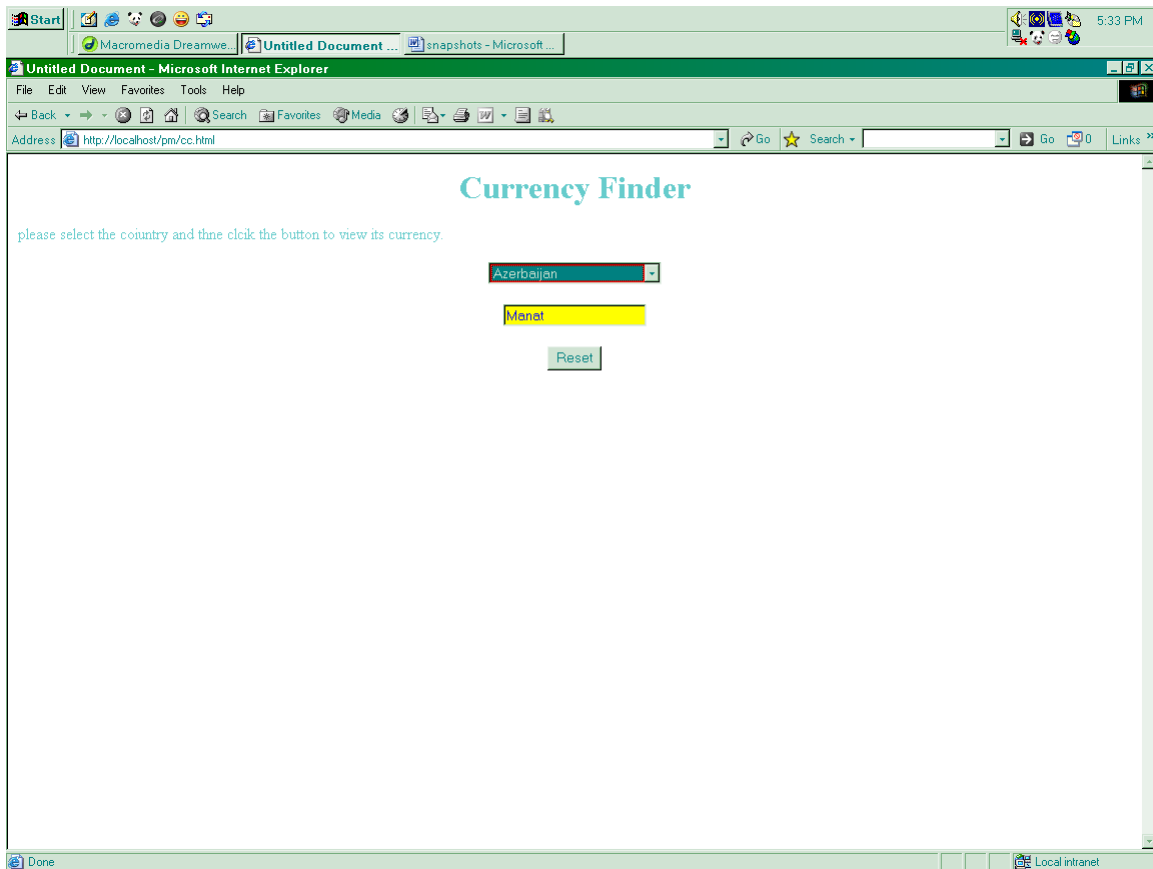
Currency Converter

Clicking this button will take the user to currency converter page where he will, convert his currency to destination currency. There is limited number of country's currency.



Currency Finder

Clicking this button will take the user to currency finder page where he will choose the country and the output will display the country's currency.



Notifications

Clear Check

This button takes the user to page where he can add notification that when the specified check is cleared the user will be sent an email from the bank. The user has to write account name ,check number and his email on which the bank will send notification.

NOTIFICATION SETUP

ADD CHECK CLEARED NOTIFICATION EMAIL

Account

Check Number

Email Address

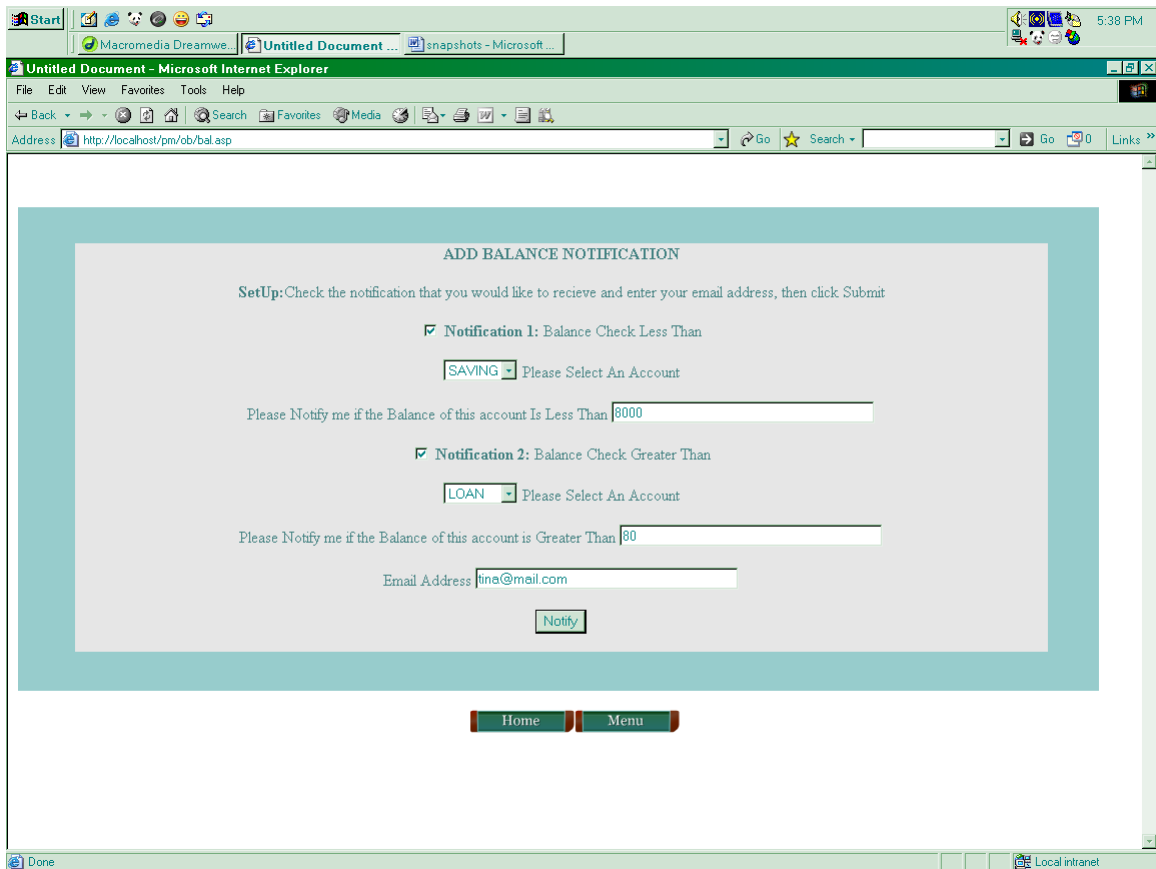
Email Message

Warning: Do not include account Numbers, Social Security numbers or any other confidential information in your message.

Done Home Menu Local intranet

Balance

This button will take the user to a page where he will write account name, email and amounts .The user will receive an email form bank if his accounts balance reaches certain limit.



The screenshot shows a Microsoft Internet Explorer browser window displaying a web page titled "ADD BALANCE NOTIFICATION". The browser's address bar shows the URL "http://localhost/pm/ob/bal.asp". The page content includes a "SetUp" instruction, two notification options with checkboxes, dropdown menus for account selection, and input fields for balance thresholds. The email address field is pre-filled with "fina@mail.com". A "Notify" button is located at the bottom of the form. Below the form, there are two buttons labeled "Home" and "Menu". The browser's status bar at the bottom indicates "Done" and "Local intranet".

ADD BALANCE NOTIFICATION

SetUp: Check the notification that you would like to receive and enter your email address, then click Submit

Notification 1: Balance Check Less Than

SAVING Please Select An Account

Please Notify me if the Balance of this account Is Less Than 8000

Notification 2: Balance Check Greater Than

LOAN Please Select An Account

Please Notify me if the Balance of this account is Greater Than 80

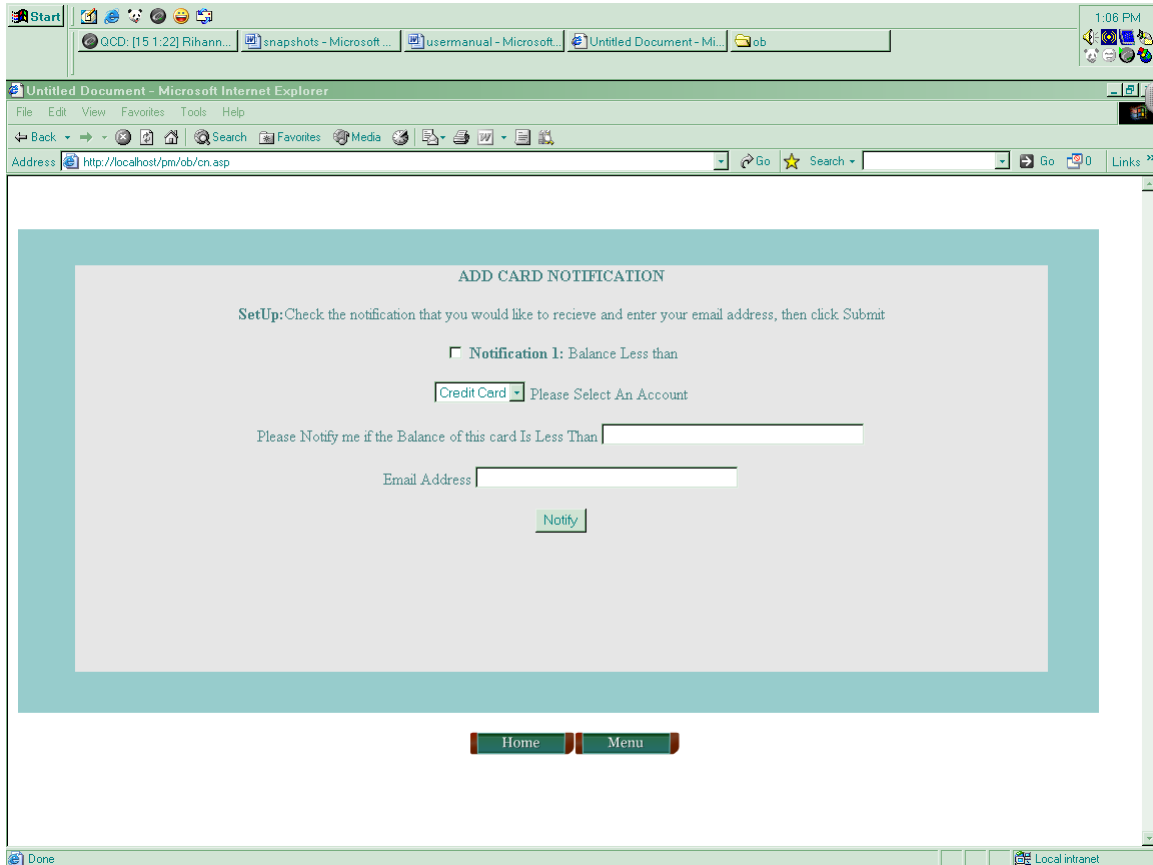
Email Address fina@mail.com

Notify

Home Menu

Card

Through this facility the user can be notified form the bank through an email the user has given to bank, if his credit or atm card balance reaches certain limit.

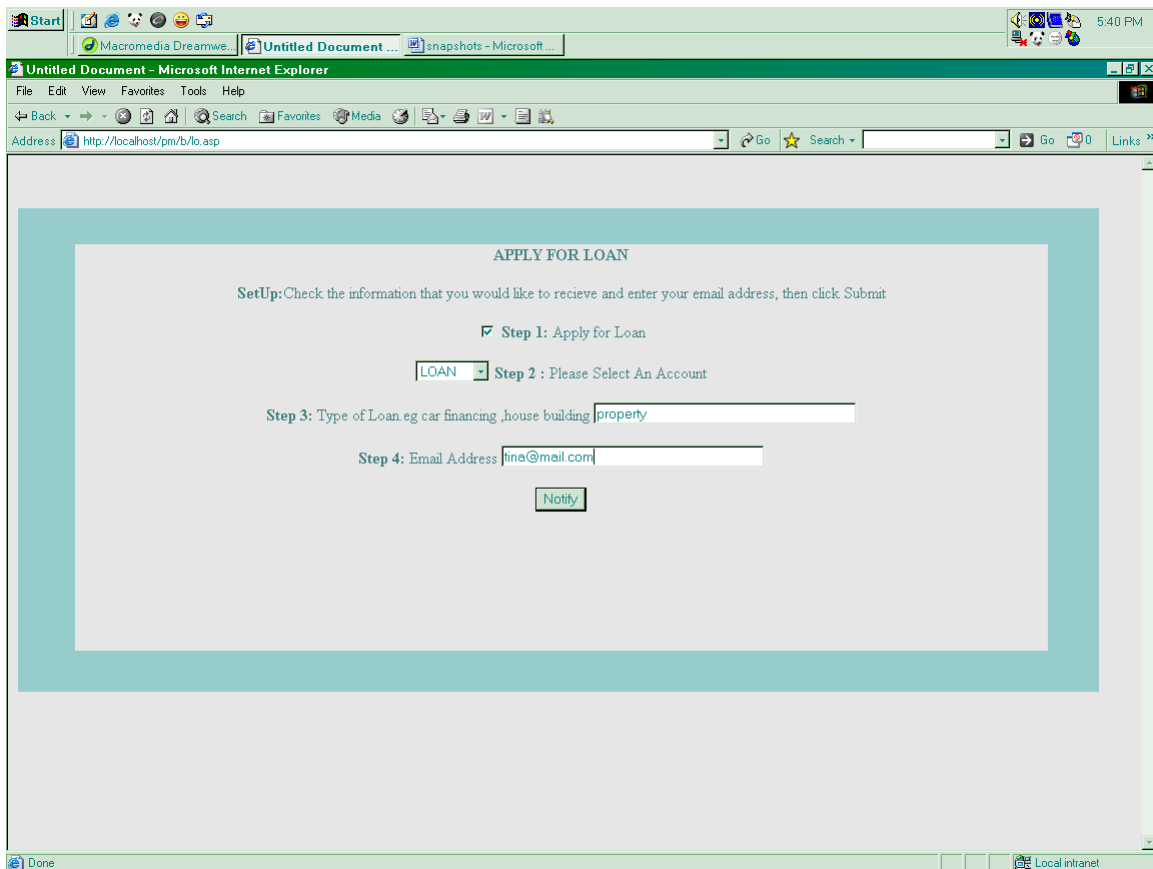


The screenshot shows a Microsoft Internet Explorer browser window displaying a web page titled "ADD CARD NOTIFICATION". The browser's address bar shows the URL "http://localhost/pmi/cb/cn.asp". The page content includes a "Setup" instruction: "Check the notification that you would like to receive and enter your email address, then click Submit". Below this, there is a checkbox labeled "Notification 1: Balance Less than". Underneath the checkbox is a dropdown menu currently set to "Credit Card" with the text "Please Select An Account" to its right. Further down, there is a text input field with the label "Please Notify me if the Balance of this card Is Less Than". Below that is another text input field labeled "Email Address". A green "Notify" button is positioned below the email address field. At the bottom of the page, there are two buttons labeled "Home" and "Menu". The browser's status bar at the bottom indicates "Done" and "Local intranet".

Apply For

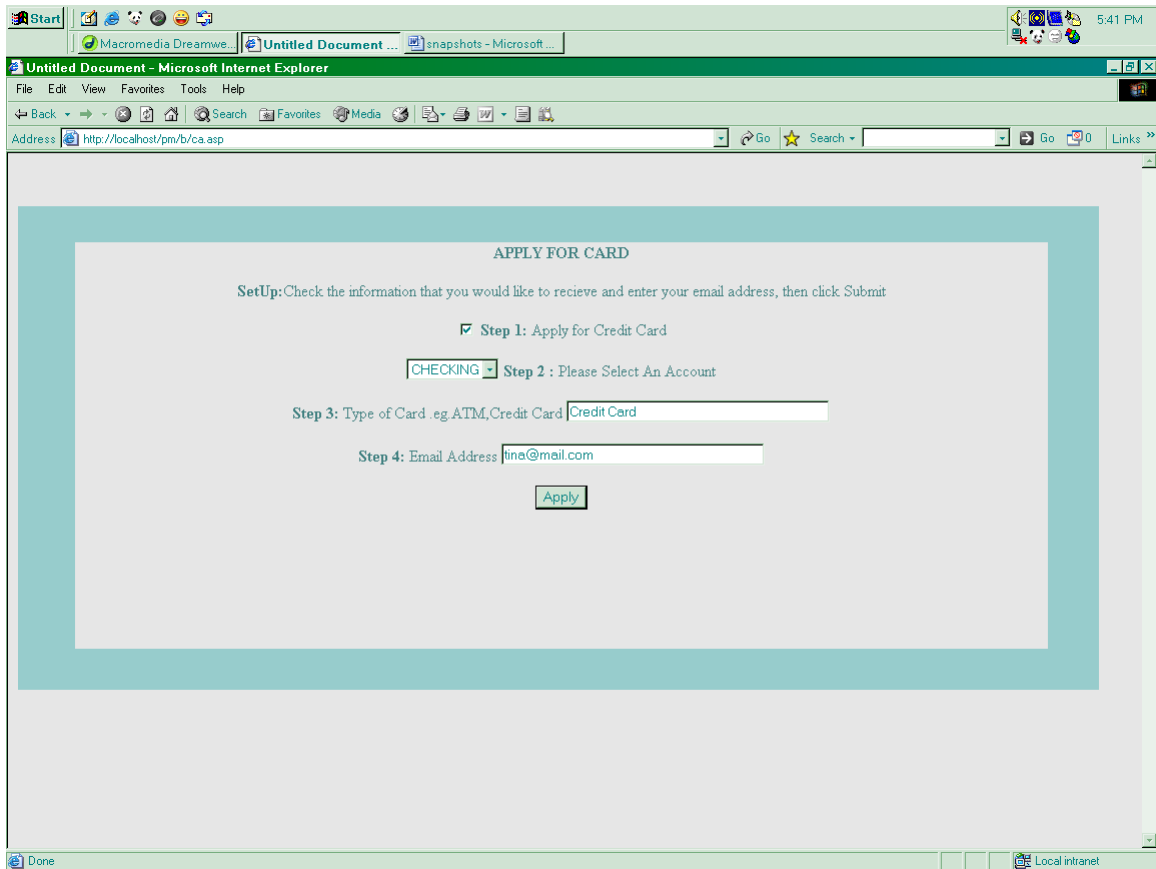
Loan

Using this button the user can apply for loan online. All the user has to do is to choose the account from which the amount will be deducted, write the name of the loan type eg car financing or house building and his email address. The client will be sent the required information regarding the Loan type, monthly installments and total amount with interest rate at his email address.



Cards

Using this button the client can easily apply for credit or atm cards online. All the client has to do is to write the card type, account name from which the initial amount will be deducted and his email address. The if the client has account in the bank then the required amount will be added to his cards and new card will be sent to his postal address.

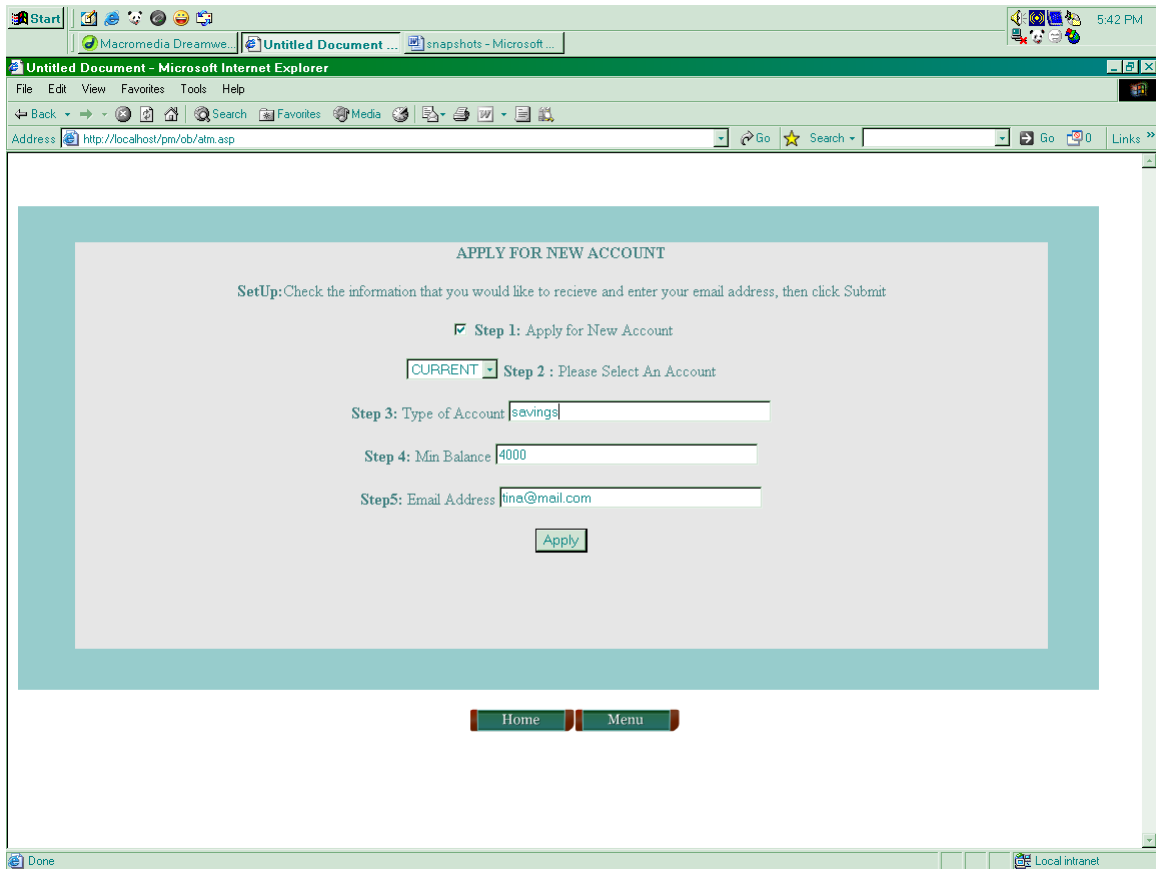


The screenshot shows a Microsoft Internet Explorer browser window displaying a web page titled "APPLY FOR CARD". The browser's address bar shows the URL "http://localhost/pm/b/ca.asp". The page content includes the following elements:

- APPLY FOR CARD** (Section Header)
- SetUp:** Check the information that you would like to receive and enter your email address, then click Submit
- Step 1:** Apply for Credit Card
- CHECKING** (Dropdown menu) **Step 2:** Please Select An Account
- Step 3:** Type of Card .eg ATM,Credit Card
- Step 4:** Email Address
-

New Account

Using this button the client can apply for new account. He has to write the previous account from which the amount will be deducted, new account type, min balance and his email. The bank will send an email to the client after processing the application.



The screenshot shows a Microsoft Internet Explorer browser window displaying a web page titled "APPLY FOR NEW ACCOUNT". The browser's address bar shows the URL "http://localhost/pm/cb/atm.asp". The page content includes a header "APPLY FOR NEW ACCOUNT" and a sub-header "SetUp: Check the information that you would like to receive and enter your email address, then click Submit". Below this, there is a checkbox labeled "Step 1: Apply for New Account" which is checked. A dropdown menu is set to "CURRENT" with the label "Step 2: Please Select An Account". Below that, there are three input fields: "Step 3: Type of Account" with the value "savings", "Step 4: Min Balance" with the value "4000", and "Step 5: Email Address" with the value "tina@mail.com". An "Apply" button is located below the email field. At the bottom of the page, there are two buttons labeled "Home" and "Menu".

Stop Payment

Single Check

You can easily stop the payment of a specific check by writing account name, check number, check amount, date and payees name. This information will be added in the bank's database and the information will be immediately processed. The bank will stop receiving payments through that check on that day.

SINGLE CHECK PAYMENT

Account Name	<input type="text" value="current"/>
Comment	<input type="text" value="this is final test"/>
Single Check	<input type="radio"/>
Check Number	<input type="text" value="123456"/>
Check Amount	<input type="text" value="9000"/>
Payee Name	<input type="text" value="tina"/>
Check Issuance Date In (mm/dd/yy)	<input type="text" value="27/11/2007"/>

This feature is used to stop payment from check number you entered. Our bank will check number and immediately stop all payments through this check.

Please Enter the details of a check you payment For.

[Home](#) [Menu](#)

Multiple Checks

The bank will stop receiving payments through a series of checks if the user fills the form writing accounts name and checks sequence number. In this way the user can stop payments of multiple checks immediately.

STOP MULTIPLE CHECKS

Account Name

Comment

MultipleCheck

Please Enter The Sequence Number Of Checks Below For Which You Want To Stop Payment

Enter Check Sequence From

Enter Check Sequence To

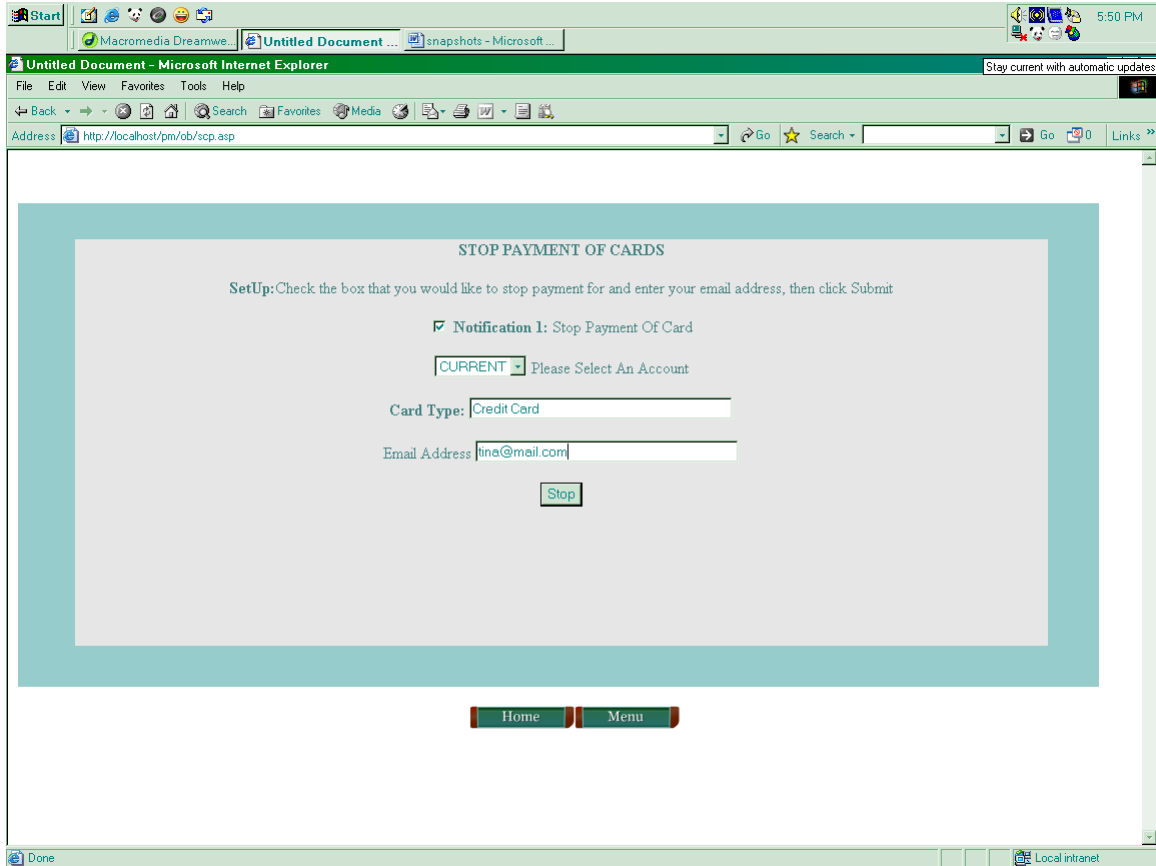
This feature is used to stop payment multiple check numbers .Our bank recieve these check numbers and immediately stop all the future paym through these checks.

Please Enter the details of the checks want to stop payments For.

[Menu](#) [Home](#)

Cards

You can stop payments of your atm cards or credit cards if you specify the account name, card type and email address.



The screenshot shows a Microsoft Internet Explorer browser window displaying a web page titled "STOP PAYMENT OF CARDS". The browser's address bar shows the URL "http://localhost/pin/ob/scp.asp". The page content includes a title "STOP PAYMENT OF CARDS" and a sub-header "SetUp: Check the box that you would like to stop payment for and enter your email address, then click Submit". Below this, there is a checked checkbox labeled "Notification 1: Stop Payment Of Card". A dropdown menu is set to "CURRENT" with the text "Please Select An Account" next to it. There are two input fields: "Card Type" with "Credit Card" entered, and "Email Address" with "hna@mail.com" entered. A "Stop" button is located below the email address field. At the bottom of the page, there are two buttons labeled "Home" and "Menu". The browser's status bar at the bottom shows "Done" and "Local intranet".

STOP PAYMENT OF CARDS

SetUp: Check the box that you would like to stop payment for and enter your email address, then click Submit

Notification 1: Stop Payment Of Card

CURRENT Please Select An Account

Card Type: Credit Card

Email Address: hna@mail.com

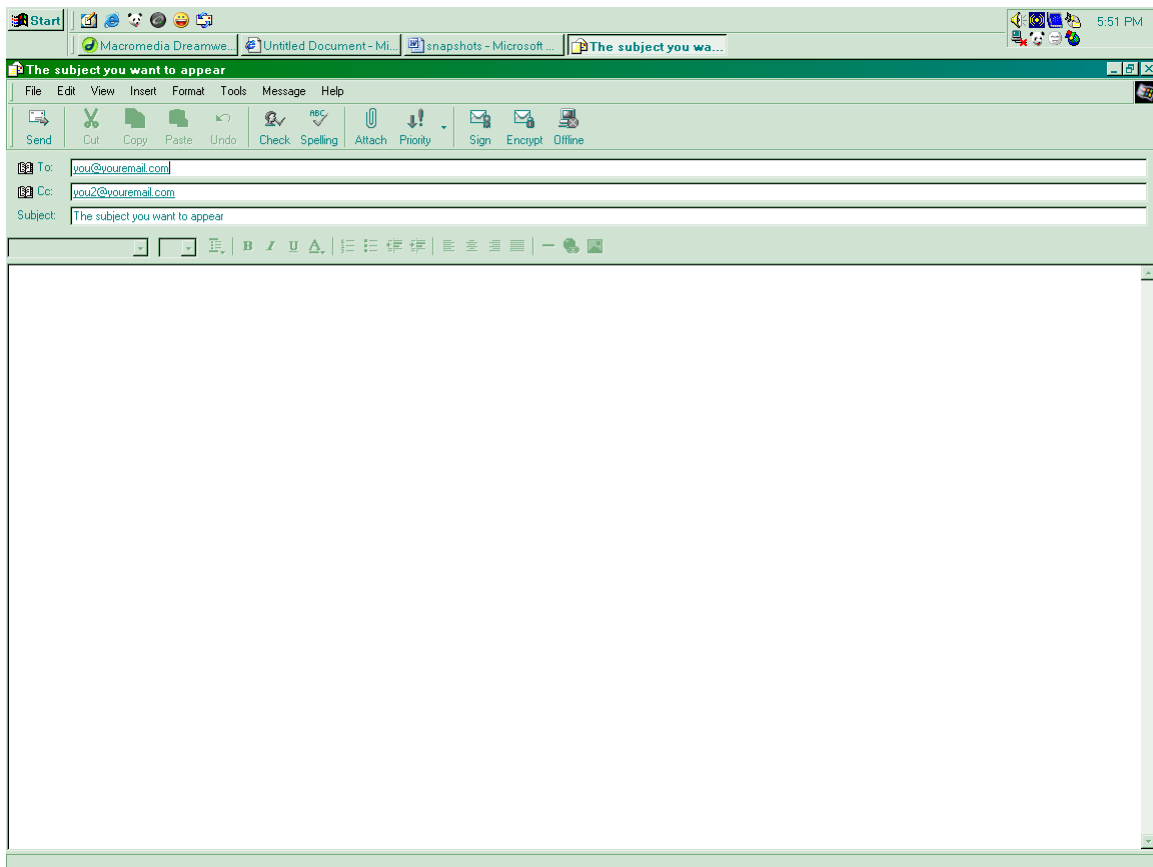
Stop

Home Menu

CR –Services

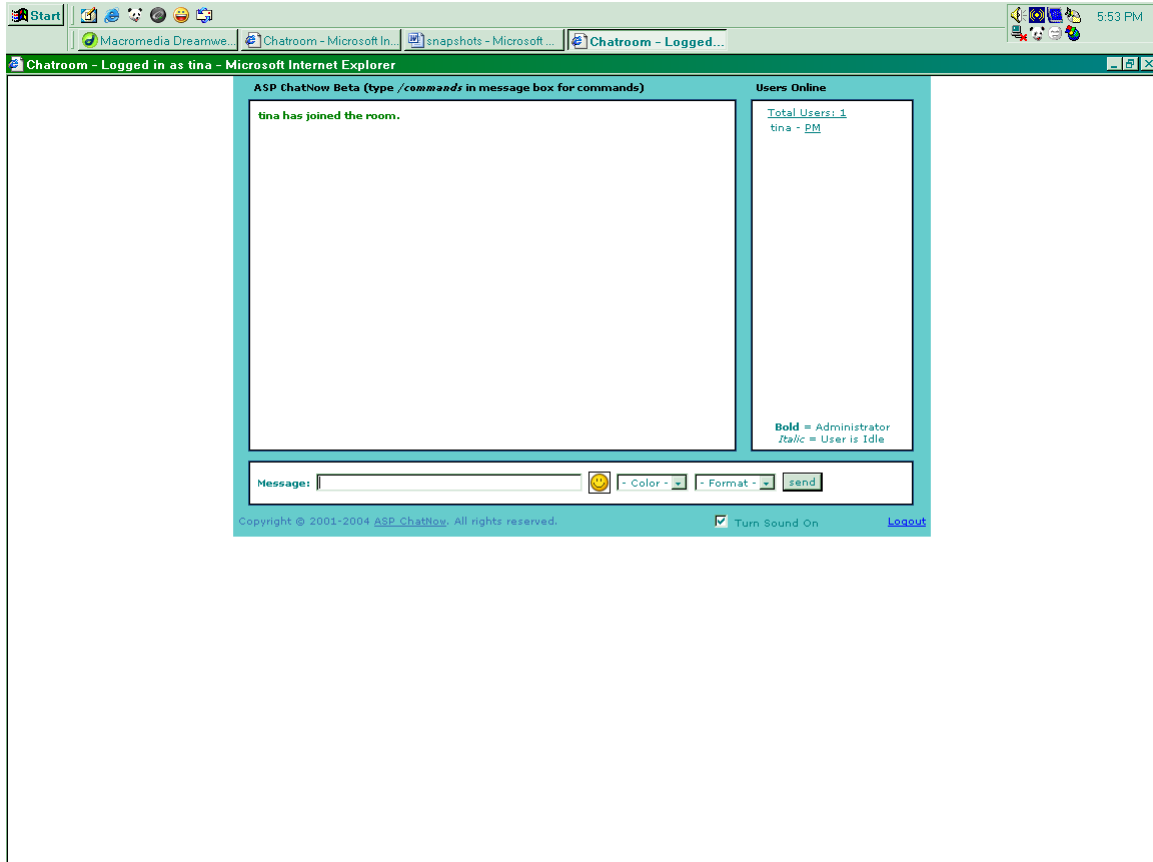
Email Us

By clicking the email us button, you will receive a page where the contact us button will be displayed. Press that button and Microsoft outlook will be opened for mailing the bank.



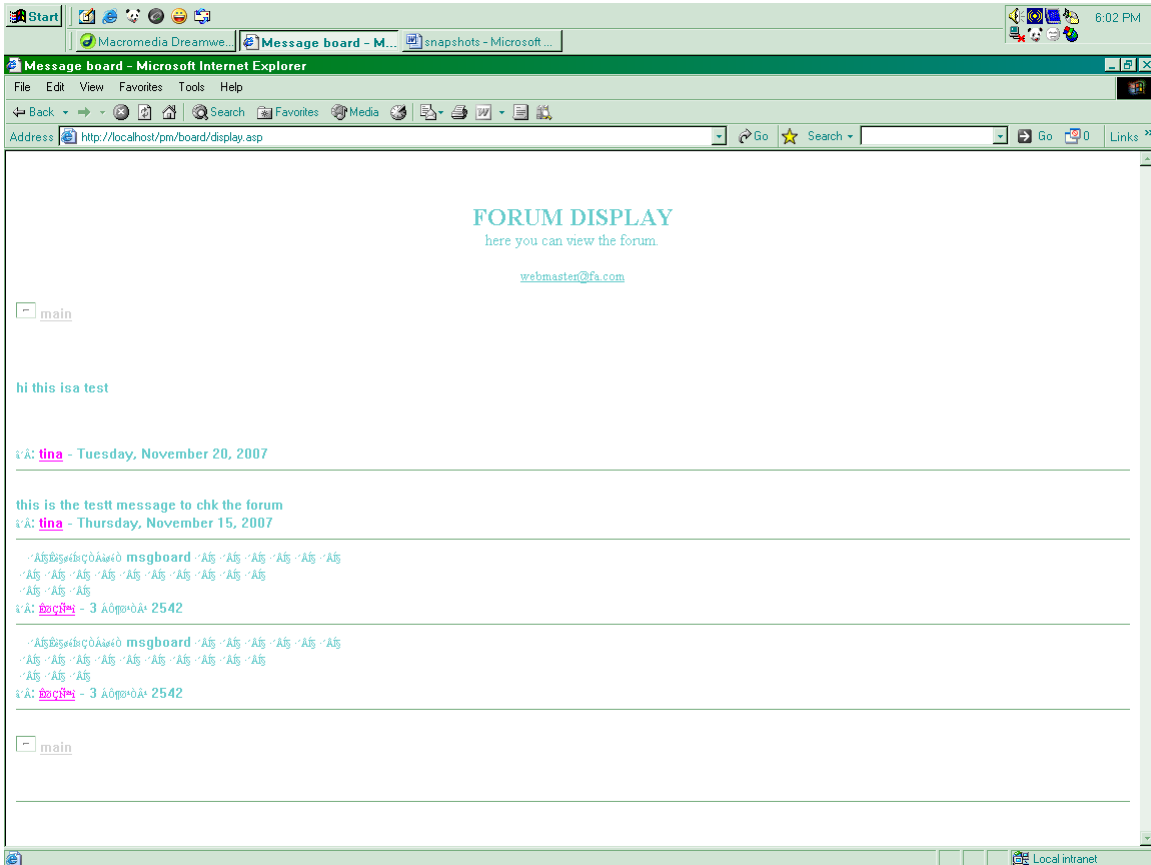
Chat

Click this button if you want live help. This will open a chat application .Log in and chat with the bank operator.



Forum

Click this button if you want to join the forum and send your views to bank discussion forum.



APPENDIX E

HOW TO'S

HOW TO'S

- **What is Online Banking?**

Online Banking is an Internet-based service that provides you a safe and convenient way to do your banking. With Online Banking, you can view your account balances, transfer funds, pay bills, send service requests to the bank and more.

- **What can I do with Online Banking?**

With Online Banking you can:

- Check current balances on personal checking, savings
- Use Calculators to find loan interest
- Use currency finder and currency converter .
- Stop payment on checks
- Stop payment on cards
- Add balance notification
- Add clear check notification
- Add cards notification
- Apply for loan
- Apply for new account
- Apply for cards.
- Send online customer service requests to:
 - Ask a technical question about Online Banking using live help desk
 - Send feedback and comments using online mail.
 - Join the discussion forum.

- **How much does Online Banking cost?**

Online Banking is a free service¹ that gives you access to your accounts

- **How do I sign in?**

To access your accounts online, enter your Online ID and passcode in the sign in box on the homepage.

- **How do I join the forum?**

Click **CR services->forum**

- **How do I use live help desk?**

Click **CR Services →chat room**

Then in the chat room, use a **nick name**

Click **join**

You will have live conversation with our bank operator.

- **How do I mail the bank?**

Click **CR Services →email us**

This will open Microsoft out look from where you can mail to our email address.

- **How do I mail anywhere?**

Click **CR Services →email us OR Click Menu→Email Anywhere**

fill the form and send anywhere.

- **How do I Stop payment?**

Click **Stop payment→single checks**

→multiple checks

→ cards.

- **How do I add alert or notification?**

Click **Notifications→ balance,**

→clear check

→ cards

- **How do I apply for any services?**

Click **Apply**→**loan**,

→**new account**,

→**cards**

- **How to use calculators?**

Click **calculators**→**simple calculator**

→**loan calculator**

- **How do I use currency finder and currency converter?**

Click **calculators**→**currency converter**

Pick the country of which you want to convert your amount into and the **source country**.

Click the button **convert**.

Click **calculators**→**currency finder**

Choose the **country** from the list of which currency you want to know and click the **button**.

APPENDIX F

GLOSSARY

GLOSSARY

Account aggregation

A service that gathers information from many websites, presents that information to the customer in a consolidated format and, in some cases, may allow the customer to initiate activity on the aggregated accounts. Aggregation services typically involve three different entities: (1) The aggregator that offers the aggregation service and maintains information on the customer's relationships/accounts with other on-line providers. (2) The aggregation target or website/entity from which the information is gathered or extracted by means of direct data feeds or screen scraping. (3) The aggregation customer who subscribes to aggregation services and provides customer IDs and passwords for the account relationships to be aggregated

Account management

Activities such as balance inquiry, statement balancing, transfers between the customer's accounts at the same financial institution, maintenance of personal information, etc.

Automated clearing house (ACH) Computer-based clearing and settlement facility for interchange of electronic debits and credits among financial institutions.

Administrative access	Individuals or terminals authorized to perform network administrator or system administrator functions.
Antivirus software	Computer programs that offer protection from viruses by making additional checks of the integrity of the operating system and electronic files. Also known as virus protection software
Authentication	Verification of identify by a computer system based on presentation of unique credentials to that system.
Automatic log-on	A feature offered by some aggregation services allowing customers to log on by clicking on a hyperlink and thereby causing the usernames and passwords stored at the aggregator to be used to log onto other websites.
Bill payment	An e-banking application whereby customers direct the financial institution to transfer funds to the account of another person or business. Payment is typically made by ACH credit or by the institution (or bill payment servicer) sending a paper check on the customer's behalf.
Bill presentment	An e-banking service whereby a business submits an electronic bill or invoice directly to the customer's financial institution. The customer can view the bill/invoice on-line and, if desired, pay the bill through an electronic payment.
Biometrics	The method of verifying a person's identify by analyzing a unique physical attribute of the individual (e.g., fingerprint, retinal scanning).

Cellular telephone	A wireless telephone that communicates using radio wave antenna towers, each serving a particular “cell” of a city or other geographical area. Areas where cellular phones do not work are referred to as “dead zones.”
Certificate authority (CA)	The entity or organization that attests using a digital certificate that a particular electronic message comes from a specific individual or system.
Check digits	A digit in an account number that is calculated from the other digits in the account number and is used to check the account number’s correctness/validity.
Digital certificate	The electronic equivalent of an ID card that authenticates the originator of a digital signature.
Direct data feed	A process used by information aggregators to gather information directly from a website operator rather than copying it from a displayed webpage
DMZ	Abbreviation for “demilitarized zone.” A computer or small subnetwork that sits between a trusted internal network, such as a corporate private LAN, and an untrusted external network, such as the public Internet.
DNS server	Abbreviation for “Domain Name Service server.” A computer that determines Internet Protocol (IP) numeric addresses from domain names presented in a convenient, readable form.

E-banking	The remote delivery of new and traditional banking products and services through electronic delivery channels.
E-mail server	A computer that manages e-mail traffic.
Encryption	A data security technique used to protect information from unauthorized inspection or alteration. Information is encoded so that it appears as a meaningless string of letters and symbols during delivery or transmission. Upon receipt, the information is decoded using an encryption key.
Firewall	A hardware or software link in a network that relays only data packets clearly intended and authorized to reach the other side.
Framing	A frame is an area of a webpage that scrolls independently of the rest of the webpage. Framing generally refers to the use of a standard frame containing information (like company name and navigation bars) that remains on the screen while the user moves around the text in another frame.
Gateway server	A computer (server) that connects a private network to the private network of a servicer or other business.
Hacker	An individual who attempts to break into a computer without authorization.

Hardening	The process of securing a computer's administrative functions or inactivating those features not needed for the computer's intended business purpose.
Hash totals	A numerical summation of one or more corresponding fields of a file that would not ordinarily be summed. Typically used to detect when changes in electronic information have occurred.
HTML	Abbreviation for "Hypertext Markup Language." A set of codes that can be inserted into text files to indicate special typefaces, inserted images, and links to other hypertext documents
Hyperlink	An item on a webpage that, when selected, transfers the user directly to another location in a hypertext document or to another webpage, perhaps on a different machine. Also simply called a "link."
Internet service provider (ISP)	A company that provides its customers with access to the Internet.
Interface	Computer programs that translate information from one system or application into a format required for use by another system or application
Internet	A cooperative message-forwarding system linking computer networks all over the world.

Interoperability standards/protocols	Commonly agreed on standards that enable different computers or programs to share information. Example: HTTP (Hypertext Transfer Protocol) is a standard method of publishing information as hypertext in HTML format on the Internet
Intrusion detection system (IDS)	Software/hardware that detects and logs inappropriate, incorrect, or anomalous activity. IDS are typically characterized based on the source of the data they monitor: host or network. A host-based IDS uses system log files and other electronic audit data to identify suspicious activity. A network-based IDS uses a sensor to monitor packets on the network to which it is attached
Kiosk	A publicly accessible computer terminal that permits customers to directly communicate with the financial institution via a network
Legacy systems	A term commonly used to refer to existing computers systems and applications with which new systems or applications must exchange information
Lockout	The action of temporarily revoking network or application access privileges, normally due to repeated unsuccessful logon attempts

Mnemonic	A symbol or expression that can help someone remember something. For example, the phrase “Hello! My name is Bill. I'm 9 years old.” might help an individual remember a secure 10-character password of “H!MniBI9yo.”
Network administrator	The individual responsible for the installation, management, and control of a network
Outsourcing	The practice of contracting with another entity to perform services that might otherwise be conducted in-house.
Passwords	A secret sequence of characters that is used as a means of authentication.
Patching	Software code that replaces or updates other code. Frequently patches are used to correct security flaws.
Penetration test	The process of using approved, qualified personnel to conduct real-world attacks against a system so as to identify and correct security weaknesses before they are discovered and exploited by others
Personal digital assistant (PDA)	A pocket-sized, special-purpose personal computer that lacks a conventional keyboard.

PKI

Abbreviation for “public key infrastructure.” The use of public key cryptography in which each customer has a key pair (i.e., a unique electronic value called a public key and a mathematically-related private key). The private key is used to encrypt (sign) a message that can only be decrypted by the corresponding public key or to decrypt a message previously encrypted with the public key. The public key is used to decrypt a message previously encrypted (signed) using an individual's private key or to encrypt a message so that it can only be decrypted (read) using the intended recipient's private key. See [Encryption](#)

Pop-up box

A dialog box that automatically appears when a person accesses a webpage

Proxy server

An Internet server that controls client computers' access to the Internet. Using a proxy server, a company can stop employees from accessing undesirable websites, improve performance by storing webpages locally, and hide the internal network's identity so monitoring is difficult for external users.

Repudiation

The denial by one of the parties to a transaction of participation in all or part of that transaction or of the content of the communication.

Router

A hardware device that connects two or more networks and routes incoming data packets to the appropriate network

Screen scraping	whereby the aggregator accesses the target site by logging in as the customer, electronically reads and copies selected information from the displayed webpage(s), then redisplay the information on the aggregator's site. The process is analogous to "scraping" the information off the computer screen
Script	A file containing active content; for example, commands or instructions to be executed by the computer
Server	A computer or other device that manages a network service. An example is a print server that manages network printing.
Smart cards	A card with an embedded computer chip on which information can be stored and processed.
SSL (Secure Socket Layer)	An encryption system developed by Netscape. SSL protects the privacy of data exchanged by the website and the individual user. It is used by websites whose names begin with https instead of http
Suspicious Activity Report (SAR)	Reports required to be filed by the Bank Secrecy Act when a financial institution identifies or suspects fraudulent activity.

Tokens	A small device with an embedded computer chip that can be used to store and transmit electronic information.
Topology	A description of any kind of locality in terms of its physical layout. In the context of communication networks, a topology describes pictorially the configuration or arrangement of a network, including its nodes and connecting communication lines
URL	Abbreviation for “Uniform (or Universal) Resource of specifying the location of publicly available information on the Internet, in the form: protocol://machine:port number/filename. Often the port number and/or filename are unnecessary
Virtual mall	An Internet website offering products and services from multiple vendors or suppliers
Virtual private network (VPN)	A wide-area network interconnected by common carrier lines or that uses the Internet as its network transport
Virus	Malicious code that replicates itself within a computer.

Wireless Application Protocol (WAP) A data transmission standard to deliver wireless markup language (WML) content

Weblinking The use of hyperlinks to direct users to webpages of other entities

Website A webpage or set of webpages designed, presented, and linked together to form a logical information resource and/or transaction initiation function

Website hosting The service of providing ongoing support and monitoring of an Internet-addressable computer that stores webpages and processes transactions initiated over the Internet

Wireless gateway server A computer (server) that transmits messages between a computer network and a cellular telephone or other wireless access device

Worm A program that scans a system or an entire network for available, unused space in which to run. Worms tend to tie up all computing resources in a system or on a network and effectively shut it down.