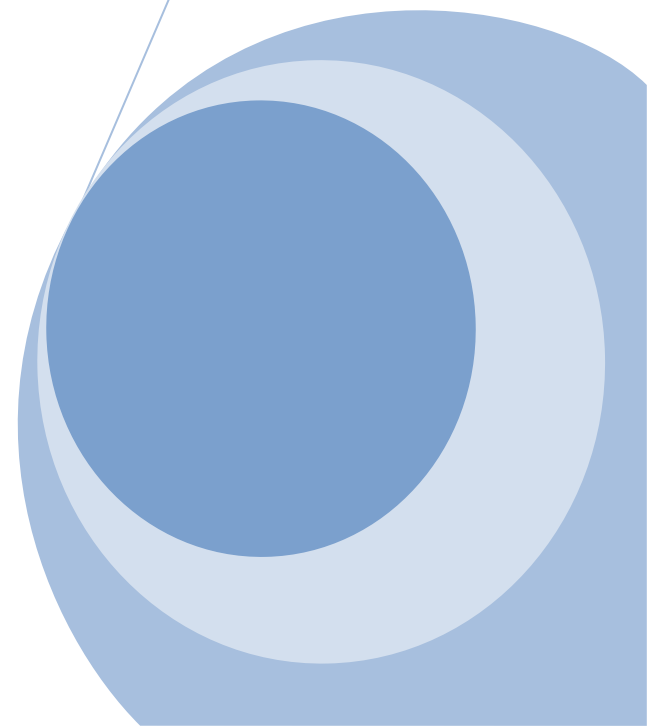
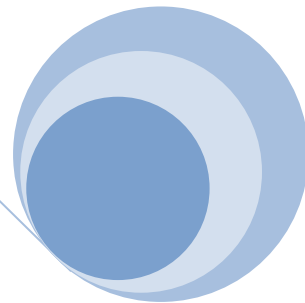
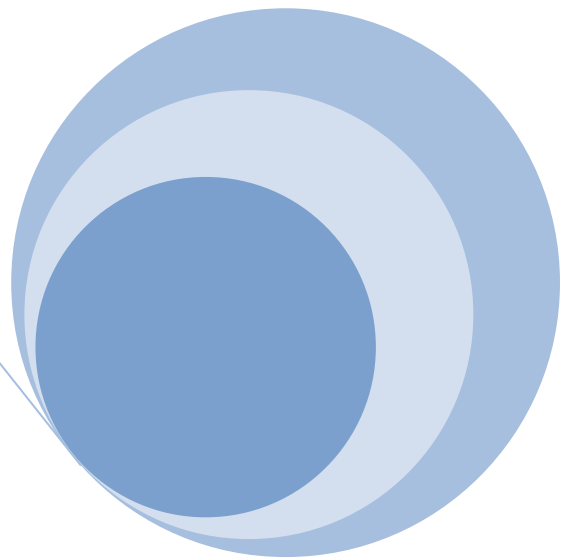


# **E -Banking**

**Dheeman Barua**



# E- BANKING

FINAL REPORT



GURU GOBIND SINGH INDRAPASTHA UNIVERSITY

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## Introduction

In the current Internet age, every application is being ported to web and allows the users to connect with the system and work online. It has allowed people to remove the barriers of time and distance. Competition and changes in technology and lifestyles have changed the face of banking. Banking being the main financial backbone of any economy cannot stay behind. Nowadays, banks are seeking alternative ways to provide and differentiate their services. Customers, both corporate and retail, are no longer willing to queue in banks, or wait on phones, for the most basic of services. They demand and expect to be able to transact their financial dealings where and when they wish. With the number of computers increasing every year, the electronic delivery of banking services is becoming the ideal way for banks to meet their client's expectations.

Online banking or e-banking can be defined as online systems which allow customers to plug into a host of banking services from a personal computer by connecting with the bank's computer over telephone wires. Technology continues to make online banking easier for average consumers. Banks use a variety of names for online banking services, such as PC banking, home banking, electronic banking or Internet banking. Regardless of the name, these systems offer certain advantages over traditional banking methods.

This application is designed to implement the banking solution on the web to enable the customers to transact, sitting at their PC, making their account available to them 24 hours a day. While the customer has all the options of transactions online, the administrative functions are still limited to the bank officials.

The system should allow the customers to perform the following tasks online:

1. View Account Balance Online
2. Transfers between account
3. Cheque book issue request
4. DD Issue request
5. Change the personal details

The system should also allow the bank officials to do the following operations:

1. Open a new account and create a new user
2. Service the cheque book issue request
3. Service the DD issue request
4. Freeze / unfreeze an account

## **Abstract**

With rapid advances in telecommunication systems and digital technology, it is difficult to predict how Internet banking will improve and expand in coming years. But with the number of computers increasing every year, the electronic delivery of services is becoming popular in the banking sector. The Indian experience of E – banking is gradually merging with its international counterparts. While the private sector and multi-national banks have been first and fast in adopting internet technology in client servicing, there is a gradual trend for the major public sectors and numerous co-operative units to move in the same direction. A mix of policy support and security assurance should propel further E – banking adoption in India.

## **Objective**

Objective of this project is to allow the bank to expose its functionality on the web, making their service available to the user – Customers. While the customers can enjoy operating their account sitting in their homes, the bank officials, working as administrators of the system are exposed to the service areas of the application.

A Customer can have multiple accounts with the bank and use the same user name and password to access them. The user name and password is provided to the customer on successful opening of the account. On acceptance of the details, an account is opened and the user name and password is created and given to them. Customers can change the password at their on leisure. Customers can modify their personal / account details or change their password.

Once a transaction is saved, the account balances must be adjusted accordingly and the new balance must be shown. Issue of cheque book and DD/MT requires interaction of the bank officials and hence it can only be requested. The request will be seen by the bank official during their business hours and processed. It might be required for the bank to freeze someone's account due to legal / police actions and hence a facility must be provided to this effect and the customer whose accounts are frozen should not be allowed to interact with the system.

## **Existing system**

For any type of transaction a person has to go to bank. It is a very time-consuming process. Because if a person is out of station then a person has to come to a particular branch of bank for any type of transaction. It means that a person who wants to do any type of transaction such as he wants to open a new account then he has to come to the bank himself manually. All tasks such as deposit and withdrawal of money, opening a new account, applying for car loan, educational loan, house loan etc. are processed by the employees of a bank. If an employee is busy then a customer has to wait for a while, so this is very time consuming for the customer to do a particular transaction with the bank. If more than one person come for transaction then person has to wait in a queue for a long time.

In existing system there is a limitation of time for doing a transaction, because a person has to walk with the bank timing specified by the bank. And if a person who wants to transfer his money from his account to another account of a person, then it takes time to be processed.

### **Drawbacks in the existing system:**

There are a few drawbacks in the existing system like:

1. The main drawback of existing system is ,its time consuming.
2. The second drawback is it uses pen and paper technique.

### **Proposed System:**

Limitations faced in the existing system can be overcome with the concept of E-Banking. All tasks performed manually can be done with computerized systems nowadays. Today E-Banking has become the most efficient way to do a transaction very fast. Majority of the transactional services will be provided by way of Internet. Net-Based banking comes at only 10% of the operating costs of conventional banking and services.

A cost comparison study done by IBM Global Services Consulting Group shows the advantage of using Internet as medium for Banking Services over other traditional medium. As per the recent survey traditional Banks spend 60% of the revenues generated to run a branch where as the cost of providing the same services via Internet comes out to be only 15%. This is a huge savings for Banks and Consumers. Consumers will access the same Services with more efficiency at low cost.

A research shows that a large population use Internet for gathering information about different financial products like Personal Loan, Credit Card, Insurance etc. thus reducing cost of printing, promotion and distribution.

The Major prospect of this project is to make web enabled application, which is administrative based to provide the complete information about all the internal activities taking place inside a bank. This application is also aimed to provide the information for the account holders to know all their transactions.

### **Benefits of Proposed System**

The main benefit is, customers can enjoy operating their account sitting in their homes, the bank officials, working as administrators of the system are exposed to the service areas of the application. It allows us to build a unique personal payee list on-line and schedule payments to be made on time. Totally compressive, yet customizable by each and every user ,bill pay thorough Net advantage provides the convenient, accessibility, reliability and security demanded by today's banking customer.

## Project Intention

- To overcome the problems of existing system.
- To develop computerized system to handle all types of transactions occurring in the bank.
- To reduce time and cost.

Potential areas where E-Banking can be used are as follows:

- Anywhere Banking: Citizen can deposit or withdraw their money anywhere in country irrespective of the branch where their parent account is held. This will give greater security for traveling business people to deposit money collected from traders/clients. ATMs is another mode of anywhere banking, consumer can use services of ATMs anywhere in country, reducing burden of carrying money while traveling.
- Smart Card Solutions: Smart cards will give helpful in bringing governmental services and banking more closer to people. Framer service centers are example of this initiative. Smart cards will be greater flexibility to users reducing the frauds and malpractices what debit cards and credit cards are not able to offer. On the other hand smart card can be used as identification card for number of other services like driving licence, passport, election id card and other things.
- Online Account Management: Citizens can manage their account online. Anytime Banking, it will reduce the time delays and dependency on bank staff and timing of operations.
- Online Bill Payment: Internet banking is frequently used for tax payments. Bill payments like of electricity, water, municipal and telephones. Many public sector companies are offering online payment services, for e.g. MTNL, BSNL etc. Indian Railways has started online reservation system for credit card and debit cardholders. In coming future even persons having Internet bank account can book seat online at ease of their home.
- Online Brokerage: Strong financial markets are always backbone of any economy. Through E-Banking channels stock trading can reach to the people who want to invest their money in financial markets but due to time constraints they are not able to visit the broker.

## Advantage: Customer

- Consumers can use their computer and a telephone modem to dial in from home or any site where they access to a computer.
- The services are available seven days a week, 24 hrs a day
- Transactions are executed and confirmed almost instantaneously.
- Also, the range of transactions available is fairly broad. Consumers can do everything from simply checking on an account balance to applying for a mortgage.
- Time saving and convenience.

## Advantage: Organizations

- Improve customer access
- Facilitate the offering of more services
- Increase customer loyalty
- Attract new customers
- Increase customer satisfaction
- Reduction in costs, as the need for physical branches is reduced
- 24 x 7 client-servicing- for general services
- Reduction in cost, as the need for manpower is reduced
- Transparent and fast response
- Directly reflected on the account statement, need for data entry is eliminated.

## The Do's of Net Banking

**RELATIONSHIP** : Banks and other financial institutions in India cannot go completely virtual, physical branches help forge a 'relationship' with the customer that a virtual bank cannot. Most customers in India prefer direct, personal contact with their banker.

**PERSONALIZATION** : Banking Solutions become truly personalized when they are able to respond to the changing customer needs. For Example, Software that might tell you which credit card balance to pay off first, or alert you in advance when your cheque will bounce. This level of personalization is still lacking in the banking solutions offered by Indian banks.

**INTERGRATION**: Another importance aspect is integration customer service and channels, so that the customer deals with a single channel that caters to diverse needs such as kiosks, ATM's, Web TV, mobile phones, pagers and branch counters. Banks need to be 'one stop shops' for an entire range of personal finance products – from loans and insurance to mutual funds and even tax savings instruments. This is being done by 'account aggregators' such as Yodlee, Corillian, eBalance and Vertical one that lets you log into website and track information as diverse as bank and credit card balances, value of investments, and frequents-flier miles from several sites, each of which has it's own username and password.

**INNOVATION:** Nowadays, banks need to depend on product innovation, expanding their range of their products and service offerings. Apart from just online accounts, e-banking would need to tailor specific products for the Internet, like online bill presentment or credit card with instant online in offering innovative products like Egg card – a credit card that features an introductory zero percent interest rates.

## **Security Issues**

One of the major issues concerning customers and organizations is the security aspect of E-banking. It is only natural that business customers show concern about sending their personal details and account numbers over the Internet. The security measures are implemented partly by the bank and partly by the customers themselves through their own vigilance.

**TRANSACTION SECURITY:** The data exchanged between bank and the customer is coded or encrypted using secure servers with 40/128 bit SSL<sup>1</sup> servers, which sit behind firewalls. The likelihood of a computer hacker breaking these security measures is very remote.

**ACCESS SECURITY:** On registration, normally two levels of security are used each time the customer accesses their account details: a user ID and password. A third level of authentication can be built in also, to protect misuse, for example querying user's date-of-birth.

**ACCOUNT HOLDER'S VIGILANCE:** However tight the banks make their security systems, it is not sufficient on its own. Business customers need to play their part too and exercise caution when banking online like not divulging their pin number or password to any third party, or not leaving their pin lying around.

## **Future of E-banking**

With rapid advances in telecommunication systems and digital technology, it is difficult to predict how e banking will improve and expand in coming years. For example, Internet Banking via mobile phones using Wireless Application Protocol (WAP) or banking services through the TV screen via the new interactive TV channels may become established. It is likely that the number of customers wanting to bank online will increase which could lead to high street banks offering personalized services and better online customer care. To combat computer crime and increase security levels, banks may consider new security measures such as iris, voice and fingerprint recognition, smart cards and electronic signatures.

The Banking sector, as a whole, is undergoing a transformation, primarily because of the advent of the internet. Financial institutions are realizing that e-banking is not just another distribution channel for their services, but a revolution as the Internet and its associate development challenge the traditional banking practices and core business units.

Corporate banks are carefully considering the best way forward and many are viewing the e-banking phenomenon an opportunity and not a threat. Smaller banks need to look at how they can best compete in their market. Developing their own Internet solutions is rarely possible and so they must look at other options to facilitate e-banking and e-commerce initiatives.



# **SYSTEM STUDY**

## **Initial study:**

This involves the investigation of the existing system which is time consuming with the user and is insufficient depth. This also includes the collection and study of detailed information and literature regarding the complete existing procedure.

The detailed initial study properly documented and the failing and problems are noted separately. The system is properly designed and proper outline of the proposed computerized system is prepared. The proposed design is brought against all the known facts and further proposals are made. Various resources including the software, hardware and manpower requirements are decided and are mentioned in the report.

## **User Objectives:**

### **The system shall:**

Be in accord with macro and micro level activities of a Net Bank.

Be user-friendly and shall facilitate smooth functioning of an e-Assembly application.

Reduce operating costs and saves time.

Enable online –status review.

Be flexible and adaptable to the existing process.

Allow some amount of customization.

Provide for seamless integration of all the modules.

## **User Requirement Specifications:**

Actual user community participation and their requirements analysis is key to success of any new information system. To carry out this work, identification of users who will actually use the system is foremost. Users at every level were even an opportunity to define their goals, objectives and their respective information needs. In addition to this exercise a critical through investigation of present reports and query generated, were carried out to define any other additional requirements that can be useful to the others.

The findings of users and other related exercise to access particular user needs are summarized below concisely:

The System must provide a graphical user interface.

Redundancy must be reduced at the maximum level.

Discrepancies should be avoided

Security systems must be provided

### **Feasibility Study:**

The prime focus of the feasibility study is evaluating the practicality of the proposed system keeping in mind a number of factors. The following factors are taken into account before deciding in favor of the new system:

#### **Economic Feasibility:**

The proposed Resume Tracking System will save lots of paper work and Facilitate magnetic record keeping thereby reducing the costs incurred on above heads. This reduction in cost prompts the company to go for such computer-based system.

#### **Technical Feasibility**

As the saying goes, "to err is human". Keeping in view the above fact, bow-a-days all organizations are automating the repetitive and monotonous works done by humans. The key process areas of current system are nicely amenable to automation and hence the technical feasibility is proved beyond doubt.

#### **Operational Feasibility: -**

The day to day maintenance of the Resume details is error prone and time-consuming. The computerization will not only increase the operational efficiency of the staff.

#### **Time and Resource Feasibility: -**

This system helps the user to find in the best usage of resources keeping in track of all the resume details over a period of time, thereby reducing the decision making process easier and worthwhile. Acts to be a solution provider in determining the best allocation of resources and finding out the way for time reduction.

System design provides the understandings and procedural details necessary for implementing the system recommended in the system study. Emphasis is on the translating the performance requirements into design specifications. The design phase is a transition from a user-oriented document (System proposal) to a document oriented to the programmers or database personnel.

System design goes through two phases of development:

- 1) Logical Design
- 2) Physical Design

A data flow diagram shows the logical flow of the system. For a system it describes the input (source), output (destination), database (data stores) and procedures (data flows) all in a format that meets the user's requirement. When analysis prepare the logical system design, they specify the user needs at a level of detail that virtually determines the information flow into an out of the system and the required data resources. The logical design also specifies input forms and screen layouts.

The activities following logical design are the procedure followed in the physical design e.g., producing programs, software, file and a working system. Design specifications instruct the user about what the system should do.

### **Logical and Output Design:**

The logical design of an information system is analogous to an engineering blue print of an automobile. It shows the major features and how they are related to oe another. The detailed specification for the new system was drawn on the bases of user's requirement data. The outputs inputs and databases are designed in this phase.

Output design is one of the most important features of the information system. When the outputs is not of good quality the users will be averse to use the newly designed system and may not use the system. There are many types of output, all of which can be either highly useful or can be critical to the users, depending on the manner and degree to which they are used.

Outputs from computer system are required primarily to communicate the results of processing to users, They are also used to provide a permanent hard copy of these results for later consultation. Various types of outputs required can be listed as below:

- External Outputs, whose destination is outside the organisation
- Internal outputs, whose destination is with the organisation
- Operational outputs, whose use is purely with in the computer department e.g., program-listing etc.
- Interactive outputs, which involve the user is communicating directly with the computer, It is particularly important to consider human factor when designing computer outputs. End user must find outputs easy to use and useful to their jobs, Without quality output, user may find the entire system unnecessary and avoid using it. The term "Output" in any information system may apply to either printer or displayed information. During the designing the output for this system, it was taken into consideration, whether the information to be presented in the form of query of report or to create documents etc.

Other important factors that were taken into consideration are:

- The End user, who will use the output.
- The actual usage of the planned information
- The information that is necessary for presentation

- When and how often output and their format is needed. While designing output for project based Attendance Compilation System, the following aspects of outputs designing were taken into consideration.
- The outputs (i.e., well formatted table outputs in the screen itself) designed are simple to read and interpret.
- Format of each output was another important point taken into consideration. Output media, for each output appropriate media is decided whether it will be displayed on screen or will be taken to printer or both.
- Other output design related specifications, i.e., how frequently the outputs will be generated, how many pages or sheets approximately it will keep up, what is its planned use and output distribution to users are also taken into account.

These were a few major designing issues, which were taken into consideration, while deciding the output specifications for the system. As direct beneficiary of reports is the user community, they were consulted constantly at every level. Formats and screen design for various reports were identified, taking into account the user requirements. Before finalising these were given to users for any improvement and suggestions. End users issues taken into consideration were Readability, Relevance and Acceptability.

Once all the output reports to be generated by ACS system were identified, they were given to users for their acceptance. For prototyping various outputs, final outputs models were created with dummy data, before they were finalised.

### **Output Sources:**

Output contents originate from these sources:

- Retrieval from a data source.
- Transmission from a process or system activity.
- Directly from an input source.

The information produced in an output can be presented as

- Tabular contents
- Graphic format
- Using Icons

### **Output Definition:**

The output should be defined in terms of:

Types of outputs

- Content-headings, numeric, alphanumeric, etc.,

- Format-hardcopy, screen, microfilm, etc.,
- Location-local, remote, transmitted, etc.,
- Frequency-daily, weekly, hourly, etc.,
- Response-immediate with in a period, etc.,

Data items

The name given to each data item should be recorded and its characteristics described clearly in a standard form:

- Whether alphanumeric or numeric
- Legitimate and specific range of characteristics
- Number of characters
- Positions of decimal point, arithmetic design, etc.,

### **Input Design:**

The input design is the link that ties the information system into the user's world. Input specifications describe the manner in which data enters the system for processing. Input design features can ensure the reliability of the system and produce results from accurate data, or they can result in the production of erroneous information.

Input Design consists of

- Developing specifications and procedures for data preparation
- Steps necessary to put data into a usable form for processing.
- Data entry, the activity of putting data into the computer processing.

### **Objectives of Input design**

Five objectives of design input focus on

- Controlling the amount of input required
- Avoid delay
- Avoiding errors in data
- Avoiding extra steps.
- Keeping the process simple.

Input stages several activities have to be carried out as part of the overall input process. They include some or all of the following.

Data recording (i.e., collection of data)

Data encapsulation (i.e., transfer of data)

Data conversion (i.e., controlling the flow of data)

Data transmission (i.e., transporting the data)

Data validation (i.e., checking the input data)

Data correction (i.e., correcting the errors)

Input Performa were designed, after a careful discussion with users. It was attempted to cover all user requirements. Designed Performa were given to user for any suggestion and final approval.

Various data items were identified and wherever necessary were recorded. As the data concerning of ACS is voluminous in nature and number of case will grow dynamically in future, proper care was taken for accuracy and consistency of data.

Input designs are aimed at reducing the chances of mistakes of errors. As the human beings are prone to errors there is always a possibility of occurrence of chance of errors. Adequate validation checks are incorporated to ensure error free data storage. Some of the data validation checks applied are as following:

- Redundancy of data is checked. It means the records of primary key do not occur twice.
- Primary key field of any table must not be left blank.
- Wherever items are coded, input code is checked for it's validity with respect to several checks.
- Utmost care has been taken to incorporate the validation at each stage of the system. E.g. when entering records into employee information table for employee, it is checked that whether the corresponding employee exists in the employee information table etc.,

Enough messages and dialogue boxes are provided while design screen, which does guide user at the time of any errors, or at time of entry. This feature provides a user-friendly interface to native users. It can be emphasized that input designs of ACS system is so designed that it ensures easy and error free data entry mechanism. Once one is sure of input data the output formatting becomes an routine work.

### **Modules of the project:**

E-banking has in all 2 modules and shall be implemented in phases. The number of phases and the modules will be implemented as follows.

- Module-1

Admin Module

- Module-2

User Module



						requested person leaves
20.	Statuses	Number	2	0-1	Not Null	Status of the requested

### Register information

Sl.No	Field Name	Data Type	Length	Domain	Constraints	Description
1.	Register Id	Number	10	0-9	Primary Key	Register ID of the user
2.	Request Id	Number	10	0-9	References Account Request(request id)	Request ID of the request
3.	First Name	Text	20	a-z, A-Z	Not null	First Name of the requested person
4.	Second Name	Text	20	a-z, A-z	Not Null	Second Name of the requested person
5.	Sex	Text	10	a-z, A-z	Not Null	Sex of the requested person
6.	Email id	Text	10	a-z, A-z	Not Null	Email id of the requested person
7.	Residence Phone Number	Text	12	0-9	Not Null	Phone number of the requested person
8.	Office Phone Number	Text	12	0-9	Not Null	Phone number of the requested person
9.	House name	Text	20	0-9, a-z, A-Z	Not Null	House name of the requested person
10.	City	Text	20	0-9, a-z, A-Z	Not Null	City where the requested person is
11.	Age	Number	3	0-9	Not Null	Age of the requested person
12.	Country	Text	20	a-z, A-Z	Not Null	Country where the requested person leaves

### Account Holder Information

Sl.No	Field Name	Data Type	Length	Domain	Constraints	Description
1.	Account Number	Text	10	0-9,a-z,A-Z	Primary Key	Account Number of the user having an account already
2.	Register Id	Number	10	0-9	References Account Request(request id)	Register id of the account holder





## DD Request

Sl.No	Field Name	Data Type	Length	Domain	Constraints	Description
1.	Request id	Number	10	0-9	Primary Key	Request ID of the DD
2.	Account Number	Text	10	A-Z, a-z,0-1	References account holder information(account number)	Account Number of the user who request for DD
3.	DD Number	Number	10	0-9	Not null	DD Number
4.	In favor Of	Text	30	A-Z, a-z	Not null	In favor of whom
5.	Payable at	Text	50	A-Z, a-z	Not null	Payable at where
6.	Commission Amount	number	4	0-9	Not null	Commission for DD
7.	Amount	number	4	0-9	Not null	Amount of DD
8.	Date	Date	12	0-9, -, a-z, A-Z		Date of DD taken
9.	Status	Number	2	0-1	Not null	Status of DD request

## Cheque Request Information

Sl.No	Field Name	Data Type	Length	Domain	Constraints	Description
1.	Request id	Number	10	0-9	Primary Key	Request ID of the Cheque
2.	Account Number	Text	10	A-Z, a-z,0-1	References account holder information(account number)	Account Number of the user who request for cheque
3.	Date	Date	12	0-9, -, a-z, A-Z	Not null	Date of cheque issued
4.	Book Number	Number	5	0-9	Not null	Cheque book Number
5.	Start Number	Number	10	0-9	Not null	Cheque book starting Number
6.	End Number	Number	10	0-9	Not null	Cheque book ending Number
7.	Status	Number	2	0-1	Not null	Status of DD request

## Loan Request Information

Sl.No	Field Name	Data Type	Length	Domain	Constraints	Description
1.	Request Id	Number	10	0-9	Primary Key	Request ID for the request
2.	Account	Text	10	0-9,a-z,A-Z	References	Account Number of

	Number				Account holder information(account number)	the user requested for loan
3.	Card Number	Text	20	0-9,-,'`		Card Number of the user having an account already
4.	First Name	Text	20	a-z, A-Z	Not null	First Name of the requested person
5.	Second Name	Text	20	a-z, A-z	Not Null	Second Name of the requested person
6.	Profession	Text	30	a-z, A-z	Not Null	Profession of the requested person
7.	Annual Income	Text	25	0-9,>,<,a-z, A-z	Not Null	Annual income of the requested person
8.	Residence Phone Number	Text	12	0-9	Not Null	Phone number of the requested person
9.	Office Phone Number	Text	12	0-9	Not Null	Phone number of the requested person
10.	House name	Text	20	0-9, a-z, A-Z	Not Null	House name of the requested person
11.	City	Text	20	0-9, a-z, A-Z	Not Null	City where the requested person is
12.	Pin	Text	10	0-9	Not null	Pin code of the requested person
10.	Email id	Text	10	a-z, A-z	Not Null	Email id of the requested person
12.	Purpose	Text	20	a-z, A-Z	Not Null	Purpose for taking the loan
20.	Statuses	Number	2	0-1	Not Null	Status of the requested

## Technology / Tools selection

The system should be developed using a web technology and should be developed as such that deployment of the system is east and effortless. Also, the technology used should be as such that interactions for the customers are very easy and user friendly.

We had plenty of options to select the technology and tools. The selection criteria we set are as detailed below:

1. The technology should be widely accepted in the industry. This makes the maintenance and upgrading the system very easy and less costly.
2. The platform should be easy to develop and allow rapid development.
3. The technology selected should be platform independent.
4. The language should be easy and robust; making is simpler to learn for the newer members.
5. The application must be browser independent.

With all these details in mind, we selected JSP (Java Server Pages) as it stands out on all the points mentioned above.

## **JAVA BEANS**

The java beans specification allows s/w components to be written in Java which encapsulate the logic behind the web application and remove the bulk of the code that would otherwise clutter up JSP's. The result is JSP code that is simpler, easier to maintain and which is more readily accessible to non programmers.

A bean user properties to describe internal data that effects how it works and what it shows. In java the actual bean property data is usually a private and protected field which can be edited by publicly available methods. In other words beans allow access to internal data via public get and set methods. This confirms to object orientation norms which hide internal data from users and explore it only through accessor methods. Another aspect of this component is that it should be able to communicate with other objects or beans. Java beans accomplish this by firing events and listening to them. A bean that is interested in what happens to an object external to itself can register itself as a listener for various events in that object. Conversely an external object can register itself to listen to that bean. This concept is really the key to providing standalone s/w components.

## **BOUND PROPERTIES**

One way of exporting events is to use bound properties. When a property value changes a bound property can inform other parts of the application that its value is changed.

## **BEAN EVENTS**

The property change support class should cater for most of the needs. However on many occasions beans will still need to communicate even though no property change activity has occurred.

## **BEAN PERSISTANCE AND STORAGE**

For a component to be really useful it must be possible to save it and any values it may contain and reload it to the same state at a later date. No matter how wonderful the component we create it will not be used much if it has to reset every time it is retrieved. Java beans use the serializable interface to address this issue. The serializable interface has no methods to implement. It is simply on indicator to the compiler that object may be made persistence by serialization. On practice serialization generally means saving the bean to file using the object Output stream class. Then to restore the bean to read from the same file using object Input stream. To make java bean to be serializable we need to do is add the serializable interface in the class declaration.

## **JDBC**

There are many classifications of databases available as Hierarchical databases, Network databases Relational databases, object databases and so on. Due their flexibility Relational database management systems are most successful breed of databases in the history of computing . Example: ORACLE, IBMdb2, MICROSOFT SQL SERVER.

A technology that enables JSP based engines is called Java Database connectivity and is an integral part of Java platform. JDBC/JSP based web application especially access the database through a finite number of database connections. These connections must be managed carefully by the application especially if a large number of concurrent users may be accessing them. To make this performance optimization JDBC uses a mechanism called connection pooling. The evaluation of this open database access technology has led to a of driver architecture

### **TYPE1 Drivers**

JDBC ODBC BRIDGE DRIVERS . the J2SE & J2EE JDK's include this Type1 Driver as a part of their distribution. By definition they are not 100% Java drivers.

### **TYPE 2 DRIVERS**

These are Veeners over the existing native code drivers from the database Vendors. They are quick & easy to implement. TYPE2 Drivers that uses the Vendors Own optimized data access protocol in the shortest amount of time without having to deal with any restrictions that may be imposed by ODBC bridging. By definition these are also not 100% pure Java.

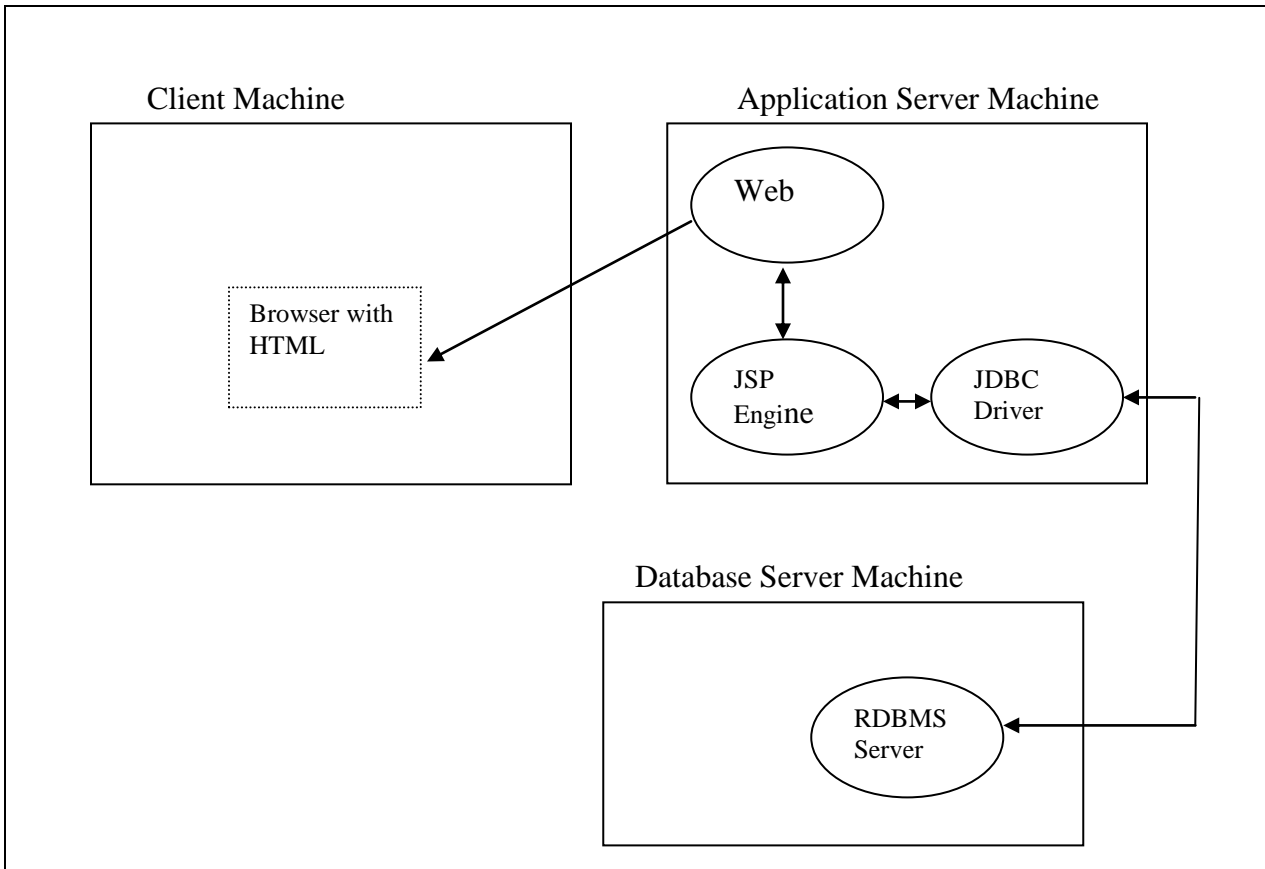
### **TYPE 3 DRIVERS**

These are really non drivers. They are front-end for database access servers & connectors. For example the proxy driver talks to the middle tier concentrator or access server . the concentrator or access sever in turn uses ODBC or Vendor specific protocol to talk to the actual database. The requirement for collaborating middle tier server is often cumbersome and very expensive too.

### **TYPE 4 DRIVERS**

These are true100% pure Java real JDBC drivers. All the mechanism of the client access is coded completely in Java. There are no calls out off or into the virtual machine and native code and there is no need for some costly server in the middle. Type 4 drivers are different for different RDBMS and are available for almost all major RDBMS vendors.

## **Interaction of JSP with JDBC**

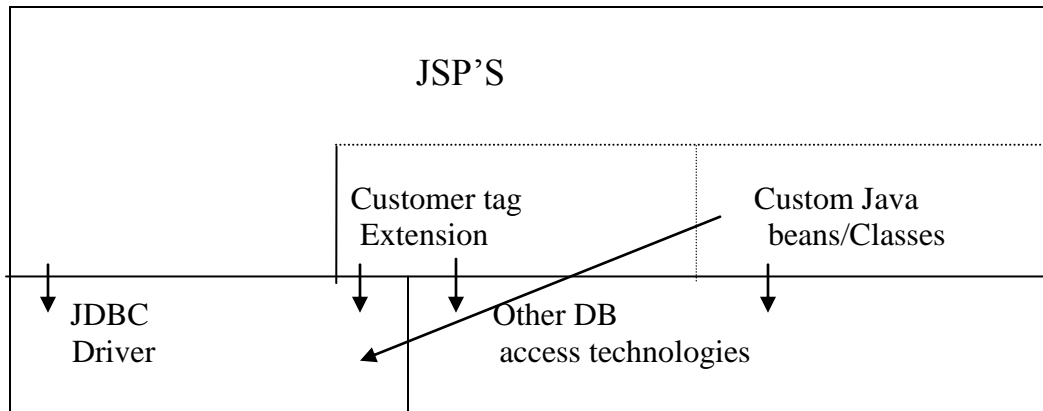


Here the browser using the web application is not required to support Java at all. The JSP has full control over how many JDBC connections are made to the server. This client never makes direct JDBC connection to the server. This solution can work readily through a firewall, only standard Http is used between the web server and the client. As a bonus this solution lends itself to an easily secured information. Simply by adding secured socket layer support to the web server. Because of this separation of the presentation from the business logic which is separated from the database. Logic, this sort of system is often called three tiers of the system. Although the application server and database server can also running on the same server machine.

There is still one minor problem with this scenario. Project personal accessing the JSP page containing the embedded JDBC code can easily and inadvertently modify the database access code and this may result in an erroneous application or even corrupted database. There are 2 solutions for this.

1. Create Java beans or Java classes that encapsulate all the JDBC operations. This is significantly better solution. But instantiation, initialization and parameterization of the Java class or the beans can still represent a significant amount of embedded Java code with in the JSP.
2. Create a tag extension set to 'pushdown' all the database access logic. The data access logic programmers write the set of custom tags. The JSP application logic designers will then use the set of custom tags to create their application.

## JSP Engine



## Web Design Constraints

The following design constraints were kept in mind while designing the pages for the whole application.

1. The pages should be consistent and easy to operate.
2. It should be designed in such a way that an average user who does not have much idea about ASP and related technology can still be able to access the information needed.
3. The Navigation should be easy and stepwise.
4. A customer may have multiple accounts and should be able to access all the accounts with a single password.
5. All the requests where a Bank must take some action, a request number should be generated so that it is easy to refer to it at a later date.
6. The entire bank official should work as administrators and should have access to all the service areas / pages of the application by the transaction areas / pages are accessible to only customers whose accounts are not frozen.

## Design

With the above constraints in mind, we have designed an interface for the pages that is consisting of three different components, namely:

1. **Header**  
Header contains information about the bank and like.
2. **Navigation Panel**  
Navigation panel has all the options available to the user. At any point of time, any of these options can be selected and used. All these options are hyperlinks and connect to different JSP files used.

### **3. Main working panel**

Main working panel is the area on the screen that is used by the application to allow user to interact with it. There are some pages where some relative actions must be taken. These actions are denoted as buttons so that it stands-out from the hyperlinks and are easy to use.

To accomplish the state structure, two framed pages are used - one for the customers and another one for the administrators. As the two types of users have different set of operations to perform in the system, it demanded two separate pages for the purpose. These frame pages are called depending on the login process.

## **SYSTEM TESTING AND IMPLIMENTATION**

The philosophy behind testing is to fine errors. The common view of testing is that it is performed to prove that there are no errors in a program. However it is virtually impossible to prove that no program will be free and clear of errors. Therefore the most useful approach and practical approach is with the understanding that testing is the process of executing a program with explicit intention of finding errors, that is, making the program fail.

Executing a program in a simulated environment performs verification. It is sometimes called Alpha Testing. Validation is the process of using the software in a live environment in order to find errors. It can be called as Beta Testing.

System testing is the stage of implementation, which aims at ensuring that the system works accurately and efficiently before actual operation commences. No program or system design is perfect; communication between the user and the designer is not always complete or clear, and time is usually short. The result is errors and more errors. The number and nature of errors in a design depend on several factors:

- Communication between the user and the designer.
- The programmers' ability to generate a code that reflects exactly.
- The system specification.
- The time frame for the design.

### **Why system testing?**

Testing is vital to the success of the system. System testing makes a logical assumption that if all the parts of the system are correct, the goal will be successively achieved. Inadequate testing or non-testing leads to errors that may not appear month later.

This creates two problems:

1. The time lag between the cause and appearance of the problem.
2. The effect of system errors on files and records with in the system.



A small system error can conceivably explode into a much larger problem. Effective testing early in the process translates directly into long-term cost saving a reduced number of errors.

Another reason for system testing is its utility as a user-oriented vehicle before implementation. The best program is worthless if it does not meet the user needs. The system should be tested properly to see whether it meet the user needs. The system should be tested properly to see whether it meets user requirements.

Testing is carried at the following states during development.

- Function Level
- Module Level

Function Level testing is carried out during individual program development to test the functionality of the entire system and the efficiency of the system, while working with large volume of data.

Individual models were checked for system and programming errors. Whether the module is doing the intended work according to the requirement specification was also tested with help of sample data.

Module testing was carried out with under mentioned objectives:

- Module interface has to be tested after compete development.
- To test whether all the features provided in the module are performing satisfactorily.
- To check if on receipt of erroneous data appropriate error message are generated.

After the completion of the above mentioned testing, acceptance testing is carried out. Acceptance testing is running the system with live data by the actual user. In acceptance testing issues like performance, user friendliness etc., are considered.

## **TESTING STRATEGIES:**

There are two general strategies for testing software. There are follows

1. Code Testing
2. Specification Testing

### **Code Testing:**

This examines the logic of the program. To follow this test, cases are developed such that very path of the program is tested.

### **Specification testing:**

Specification testing examines the specifications starting what the program should do and how it should perform under various conditions. Then test cases are developed for each conditions and combinations of conditions and to be submitted for processing.

## **SOFTWARE REQUIREMENT:**

Concept	=> Web Application
Technologies	=> Client-Server Technology
Front-End Tool	=> HTML, JavaScript, JSP, Java Bean
Back-End Tool	=> ORACLE 8
Environment	=> Internet

## **HARDWARE REQUIREMENTS:**

Machine	=> Intel 80x
HDD	=> 4.3 GB
RAM	=> 64MB
CD ROM	=> 48 X
Clock Speed	=> 450 MHz
Floppy Drive	=> 1.44 MB

## **Conclusion**

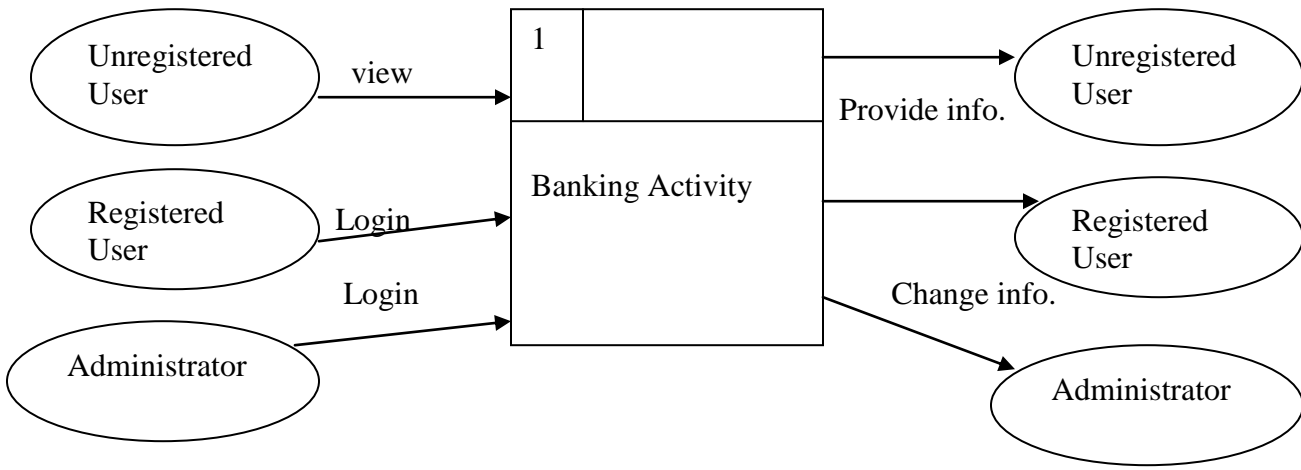
It is believed that in the future Internet Banking will recede in importance as a strategic application to become a competitive necessity that must be adopted by most of the government departments.

India is striding smoothly towards integrated E-Governance. In next five years situation will be entirely different. Most of the Banking and Governmental transactions will be web based. This is just a transformation phase towards knowledge economy. There is a great role to be paid by the citizens of the country to adopt E-Governance and should not resist to change. Quick adoption emerging pro-active knowledge society, the Central Government and the State Government will have no choice to constantly improvise to bring in greater efficiency, Accountability and Transparency in their functioning.

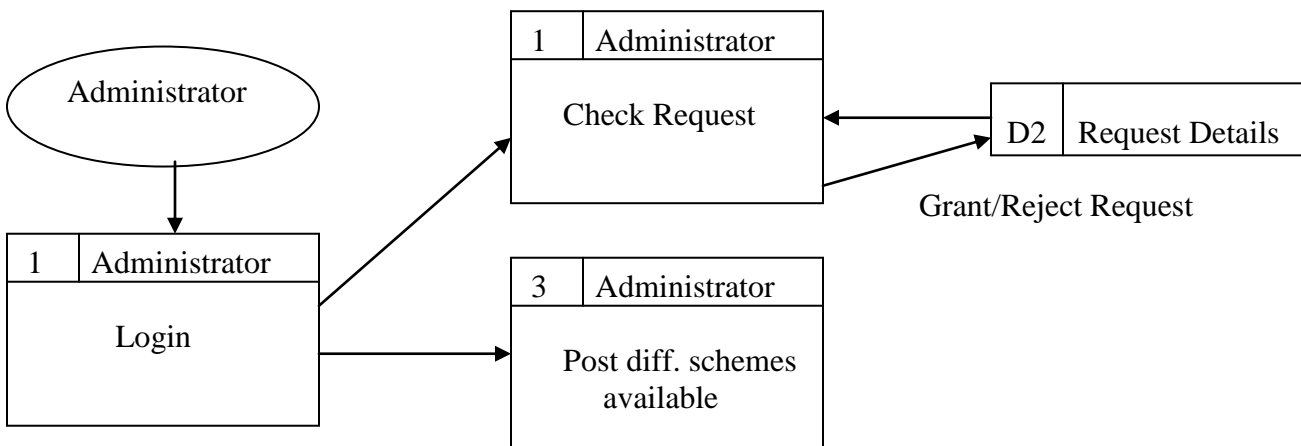
With the development of asynchronous technologies and secured electronics transaction technologies, more banks and departments are using Internet for transactional and information medium. Users of E-Banking can perform common banking tasks such as writing checks, paying bills, transferring funds, printing statements in balance inquiry etc. Internet Banking has evolved into 'One stop service and information unit' that promises great benefits to all.

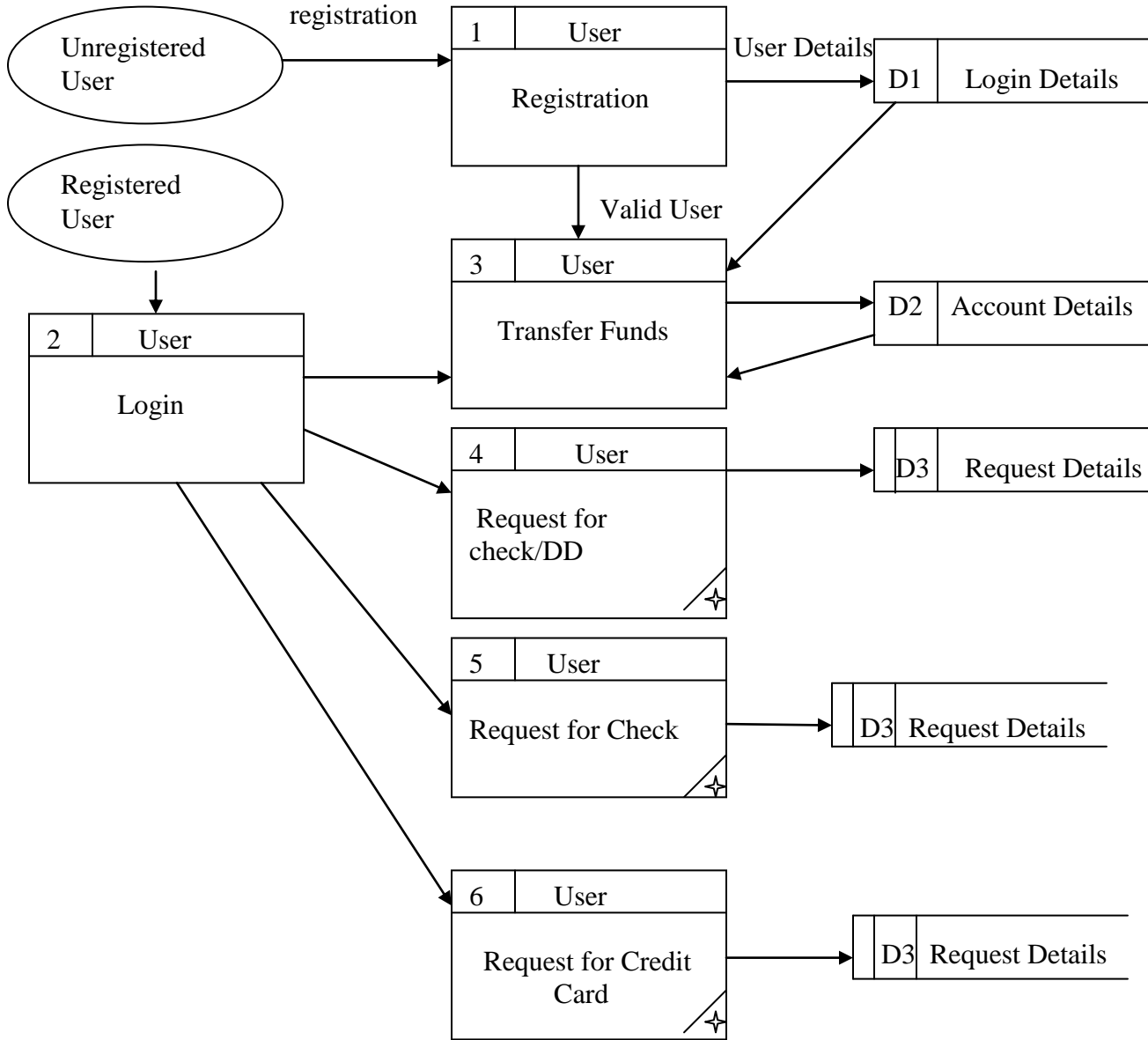
# DATA FLOW DIAGRAM

## LEVEL 0:

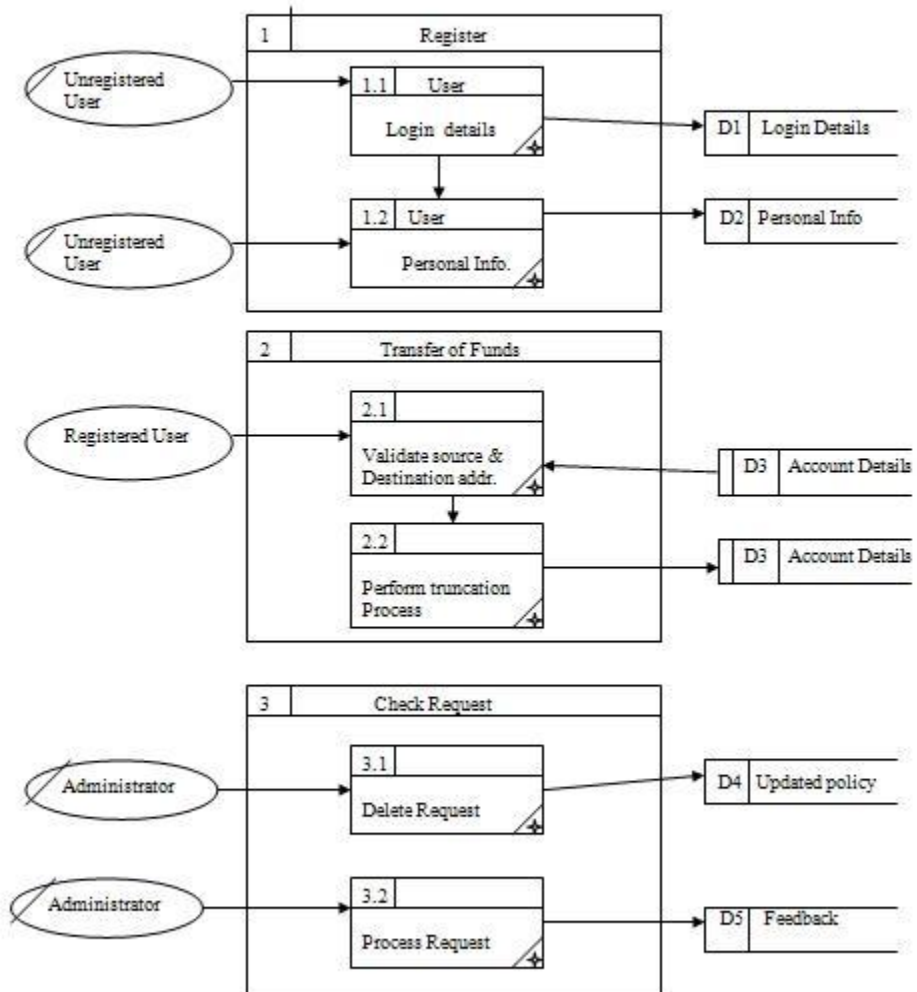


## **LEVEL 1:**





## LEVEL 2:



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J2EE The complete reference

### **Web sites**

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[www.regal-bank.com](http://www.regal-bank.com)  
[www.icicibank.com](http://www.icicibank.com)

## **Future Enhancement**

In this project only part of the e-banking features are implemented. In the future the complete features of the banking process can be built into this system.