

NET BANKING

A Project done at kaashyap Radiant, Coimbatore



PROJECT REPORT

Submitted in partial fulfillment of the
requirements for the award of the degree of
MASTER OF COMPUTER APPLICATIONS
Of **Bharathiar University**

P-594

SUBMITTED BY

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Internal Guide

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KUMARAGURU COLLEGE OF TECHNOLOGY
Coimbatore – 641 006
MAY 2001

CERTIFICATE

This is to certify that the project work entitled

“NET BANKING”

is submitted to **Kumaraguru College of Technology**, Coimbatore (Affiliated to Bharathiar University) in partial fulfillment of the requirements for the award of the degree of Master of Computer applications is a record of original work done by Mr.N.CHITHARDAN, Reg.No. 9838MO503 during his period of study in the Department of Computer Science and Engineering, Kumaraguru College of Technology, Coimbatore under my supervision and this project work has not formed the basis of award of any Degree/Diploma Associateship/Fellowship or similar title to any candidate of any University.

S. J. Jayaram
Professor and Head 26/4/01

M. A. K.
2014
Guide

Submitted to University Examination held on 11-5-2001

M. A. K.
11/5
Internal Examiner

M. S. J.
External Examiner 11/5/01

CERTIFICATION

This is to certify that **Mr. Chithardan. N** final year of **M.C.A.** computer Science, student of **Kumaraguru College of Technology Coimbatore**, has completed his project work titled "**Net Banking**" developed using Html, JAVA Servlets, and Jdbc from month Dec 2000 to April 2001.

In the discharge of his duties **Mr. Chithardan. N** has always been a willing worker and has learned and developed this project titled "**Net Banking**". His Knowledge and dedication to work has been found extremely satisfactory. We wish his success in all his endeavors.

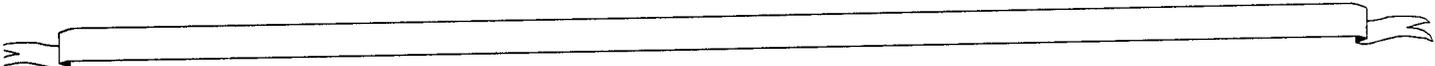
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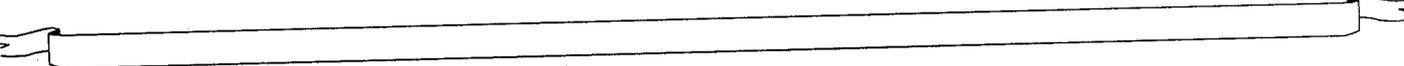
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Declaration



DECLARATION

I hereby declare that this project work entitled

“NET BANKING”

submitted to **Kumaraguru College of Technology,**
Coimbatore (Affiliated to Bharathiar University) is a record of original work done by me
under the supervision and guidance of **Mr.J.Dinesh, Project Manager, Kaashyap
Radiant,** Coimbatore and **Mr. M. Saravanamuthu, Lecturer, Department of Computer
Science and Engineering, Kumaraguru College of Technology, Coimbatore** and this
project work has not formed the basis for the award of any Degree/Diploma/
Associateship/Fellowship or similar title to any candidate of any university.

Place: Coimbatore

Date : 20/4/2001

N. Chithardan
Signature of candidate
(N.CHITHARDAN)

M. Saravanamuthu
Staff-in-Charge

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SYNOPSIS

E-banking is a generalized package developed by Kaashyap Radiant and **NET BANKING** is a module. It is used to open an account and verify the account status throughout the day. It has two parts namely administration part and user interaction part. Any customer can open their account with various account types like Current account, Saving account, Recurring deposit, Fixed deposit and he can withdraw or deposit the money in the case of Saving account. And also it has been added with some tools like Maturity value Calculator, Question and Answer section. These entire things are under high security using policy tools and SSL technique.

There is a Database updation module included with this system that is to be used by authorized bank staffs to update the databases regarding the various account types.

ACKNOWLEDGEMENT

At the outset, I take this opportunity to express my deep sense of gratitude to my beloved principal Dr.K.K. Padmanabhan, B.Sc (Engg), M.Tech, Ph.D for his constant encouragement throughout the period of my project.

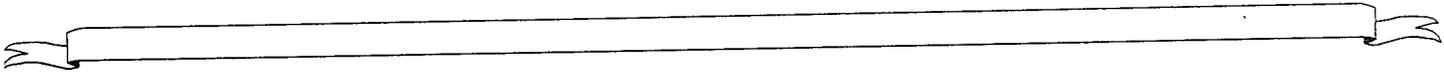
I am greatly indebted to Dr.S.Thangaswamy, Ph.D, Professor & Head of the Department, Department of Computer Science & Engineering for his valuable guidance and support through out the project.

I express my sincere gratitude to Mr. M Saravanamuthu M.C.A, PGDBA, BLIS, MISTE Lecturer Department Of Computer Science & Engineering, for providing me constant support and encouragement for successfully completing this project.

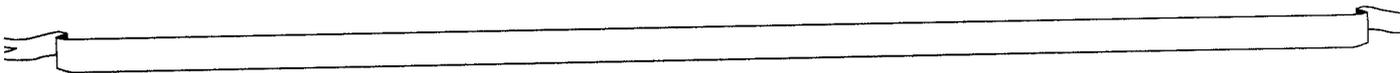
There are no adequate words to express my sincere gratitude to Mr.S.Senthil, Kaashyap Radiant, for giving me the opportunity to do this work at his esteemed institution.

My sincere thanks to my guide Mr.J.Dinesh, for his valuable guidance, encouragement and sustained help given at every stage of my project.

Finally, I place my humble accolades to my beloved parents and friends who were always with me, providing moral support and helping me at every stage of my project.

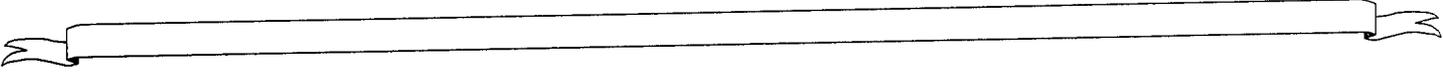


Contents

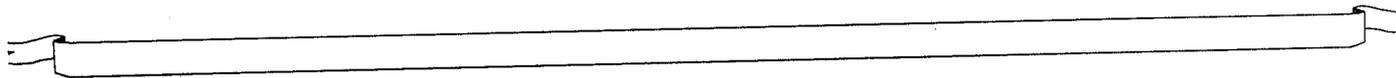


CONTENTS

1. INTRODUCTION	1
1.1 PROJECT OVERVIEW	2
1.2 ORGANIZATION PROFILE	5
2. SYSTEM STUDY AND ANALYSIS	10
2.1 EXISTING SYSTEM	11
2.2 PROPOSED SYSTEM	13
2.3 REQUIREMENTS ON NEW SYSTEM	19
2.4 USER CHARACTERISTICS	20
3. PROGRAMMING ENVIRONMENT	21
3.1 HARDWARE CONFIGURATION	21
3.2 DESCRIPTION OF SOFTWARE AND TOOLS USED	22
4. SYSTEM DESIGN AND DEVELOPMENT	47
4.1 INPUT DESIGN	47
4.2 OUTPUT DESIGN	48
4.3 DATABASE DESIGN	51
4.4 PROCESS DESIGN	55
5. SYSTEM IMPLEMENTATION AND TESTING	56
5.1 SYSTEM IMPLEMENTATION	56
5.2 SYSTEM TESTING	57
5.3 REFINEMENTS BASED ON FEEDBACK	59
6. CONCLUSION	60
7. SCOPE FOR FUTURE DEVELOPMENT	61
8. APPENDICES	62
APPENDIX – A Data Flow Diagram	
APPENDIX – B Screens	
APPENDIX – C Reports	
9. BIBLIOGRAPHY	



Introduction



1.INTRODUCTION

As the base of communication shifts to the electronic world a banking transaction can be done just at the click of a mouse. The very concept of Internet banking or electronic banking or Online banking is more prevalent in the technologically developed parts of the world such as Europe and United States of America. Net banking does not involve any physical exchange of money, but it's all done electronically, from one account to another, using the Internet. In the late 1998 only 863 banks were Internet enabled but, by mid 1999 the number was 1,845 and now it is reached 2349 according to Blue Sky International Marketing an US-based research agency. The cost per transaction through the Internet is 27 times less than through ATM's, 54 times less than that of a telephone transaction, and 107 times less than that of a physical transaction.

Citing 3 Major factors for banks having to adopt this technology, First, by getting customers to use the Internet, banks can process transactions much (and don't have to close by 2.00 p.m.) And free up more time to engage the physical branch staff in activities such as sales and service. Second, it's a cost saving factor, but more a convenience factor. Anytime banking, Anywhere banking, Anyplace banking. Once the customer gets used to this, things will become easier.

And the third being the Internet, which acts as a great facilitator. The ability to connect banking services to payments is one. Payments will come directly from a person's bank account to a merchant. It could be a seamless transaction, reducing the need to carry cash around.

The sheer convenience stemming from the fact that it is independent of location and time - of Internet banking will accelerate the adoption of the service. The bank is now available through any terminal offering Internet access be it a PC, a handheld device or cable TV with Internet access.

1.1 PROJECT OVERVIEW

The objective of the project NET BANKING is automating the account checking process of commercial banks like ICICI, HDFC, TIMES BANK etc. It consists of two parts namely Internet part where the interaction between the bank and the customer takes place, the second part consists of Intranet part where all the administrative processes are takes place namely allocating User id, Password, Interest rates etc.

NET BANKING is used to open an account for a customers or employee in a bank and checking their account status from any where in the world via the Internet. NET BANKING includes the following features,

-
- ✓ Enrollment of account for customers
 - ✓ Enrollment of account for employees
 - ✓ Checking and accessing their account information
 - ✓ Transfer of money from one account to other account
 - ✓ Financial section
 - ✓ Security
 - ✓ Query section
 - ✓ Demo
 - ✓ Searching facility
 - ✓ Maturity value calculator

Account enrollment:

Any customer or employee can open an account by using the software NET BANKING by filling the personnel information and the type of account

1. Current account
2. Saving account
3. Fixed deposit
4. Recurring deposit.

Employees have additional benefits like high rate of interest and nil balance maintenance etc. Each account has it's own features for example the fixed deposit amount cannot be withdrawn unless the validity period has finished.

Software model:

NET BANKING implements 3-tier architecture model.

- Presentation layer
- Application server model layer
- Database server model layer

All the GUI features are implemented at the presentation layer. All the server side programs are implemented at the application server model. The Database server model layer activates the connection between the program and the database.

Security:

A three-tiered security policy that governs all aspects of Web Banking Payment.

The first tier is Data Source Security. All requests for data must pass through two distinct validations.

The second tier is Data Transmission Security. Secure Socket Layering (SSL) protects all transmissions between end user and the Bank server via the Internet. SSL utilizes authentication and encryption technology.

The third tier is Account Protection Security. In order to access Web Banking, the user must enter their User identification number and Password. In the event that someone know User identification number and tries to guess Password or vice versa, the system will deny account access and lock the account.

Other features:

Customers can interact with the banking system at the query section where they can clear their doubts by sending the questions to the Bank server.

A demo has been given to the new users where they can find how to login and check their account status and all bank related activities.

Maturity value calculator will give the estimated amount at the required rate of interest for various types of account.

1.2 ORAGANIZATION PROFILE

Kaashyap Radiant System is Joint Venture with Radiant System Inc., NJ., U.S.A with a branch at Coimbatore, India. Kaashyap is business partner of Computer Associates, Microsoft, Oracle, IBM, Fujitsu and Lotus Inc.

Organizational IT systems over the past few decades have collected vast stores of data. Today's requirement is to drive "Intelligent Information" from such data and to also allow this data and information to be accessed

from and across distributed geographical points using expeditious and inexpensive communication channels such as the Internet. Kaashyap Radiant's primary business focus is to add such "Intelligence" and "Mobility" to data.

Kaashyap Radiant is dedicated to developing and providing cutting edge technology solutions in the areas of:

- Business Intelligence
- OLAP tools
- Data Warehousing
- Cross Platform Migration
- Supply chain Management
- E-Commerce
- Groupware and Knowledge Management
- Migration and Web Enabling

Kaashyap Radiant's solutions are always innovative and state-of-the-art and at the same time practical and user-friendly, with a laser sharp focus on achieving their client's business goals.

Kaashyap Radiant's secret is kaashyap's people. A rich pool of business and technical consultants ensures a superior understanding of information systems across various business processes as well as technically superior solutions, utilizing the best of today's technologies.

Industry Focus:

- Manufacturing Industries (Discrete and Process)
- Retailing
- Financial Industries
- Insurance
- Hospitality
- Telecom

Advantages:

- ✓ One stop shop for all your software outsourcing needs
- ✓ On time and On budget delivery
- ✓ Highly skilled and experienced managers and consultants who understand your functional as well as technical requirements
- ✓ Expertise in state-of-art technologies

Kaashyap projects:

⇒ Kaashyap's expertise extends to developing "State Of Art", Business Intelligence software tool –"Eyewitness" to developing tools for analyzing Quality performance in Process Control.

Eye-Witness is a high-end multidimensional Business tool, which provides for rigorous, drill down analysis of corporate data in an organization with the ability to reuse code that simplifies applications maintenance and updating.

The flexible and user-friendly interface with multi-dimensional analysis empowers almost everyone in the Organization to analysis data to their requirements. Simple Query Building features enable even non-technical user to build queries from database directly and performs wide-ranging analysis with different parameters. It also provides a built-in library of templates and powerful template tools with customizable screen builder templates.

⇒ Eyewitness is an advanced OLAP product, which takes full advantage of the latest COM technology. It is, open, scalable and supports Client-Server and standalone implementations. Eyewitness sets the standard for Business Intelligence solution needs in today's ever-changing competitive business environment.

⇒ Textile Management System is a software tool which analyzes a textile mills overall quality performance. It integrates all monitoring and testing installations of a mill and gives instantaneous indication and also the source of quality deviation in any of the process. It also compares quality levels with standards.

Textile Management System is open, scalable and supports Client-Server and standalone implementations. It also gives connectivity to Online monitoring and Offline testing.

Resources:

Kaashyap has a pool of consultants with rich experience and expertise in the latest of Database, GUI and Programming language technologies. All projects are monitored by Quality Council to ensure consistent high quality work.

Offices:

Kaashyap's Head office and development center is based at Coimbatore, India. Kaashyap is a joint venture with Radiant Systems Inc., NJ., U.S.A.

2. SYSTEM STUDY AND ANALYSIS

A system study is nothing but study on specific operation that can be performed efficiently by a computer. The main idea of system study is collecting data on the existing system and performing a critical documentation of that data to factor out relevant information.

System study is conducted with the following objectives:

- Identify the needs of the Customer.
- Formulate set of software requirements.
- Forecasting the availability of products for sale at the service provider's end.

System analysis means analyzing the existing operations, where data is required to satisfy the user needs. This leads to get a clear idea about future processing activities, which is done by system investigation. It includes

- Detailed study of the existing operation
- Gathering user requirements
- Data collection

2.1 EXISTING SYSTEM:

The information regarding various accounts, schemes and for each schemes the various aspects such as eligibility criteria, maximum and minimum loan amount, Interest rates, processing charges, payment modes etc are available in pamphlets and brochures. Whenever the details of loans have to be known, the pamphlet has to be searched for different accounts. In banks, which offer many types of account such as current account, saving account, fixed deposit, recurring deposit etc. there may be different schemes for each of such type account. This makes reference to a particular scheme very difficult.

Moreover, if the due amount to be paid for a particular account type under specific scheme has to be known, then it has to be manually calculated by referring to the particular scheme to know the interest rates of the scheme. Any customer may want to know the due amount and the interest rates of the various schemes available for the specified account type. The amounts are calculated manually by referring to different schemes which is very tedious. Additional difficulty is that the customer has to seek the assistance of bank staff who should have a good knowledge of the various schemes available.

Above all, these manual calculations by referring to the pamphlets and brochures cannot be done when the bank uses the technology of Internet Banking or e-banking. While listing about the offering of open an account and checking the status by bank in their web page there is need for software to interact efficiently with the bank. NET BANKING software gives all relevant details regarding various types of account schemes.

Pitfalls of the existing System

The pitfalls of the existing system can be pointed as follows: -

- ⇒ In banks with large number of schemes referring to different pamphlets is very tedious
- ⇒ The manual calculations of amount is difficult
- ⇒ The customer has to seek the assistance of the bank staff to know about the various schemes
- ⇒ Calculations of interest and due amounts for different schemes may often frustrate the bank staff
- ⇒ Above all, these manual calculations can not be presented on a web page in the case of Internet Banking

2.2 PROPOSED SYSTEM

The system proposed is called as the 'NET BANKING', which is otherwise known as Internet Banking or e-banking. It provides a way open an account in a bank. The user can select either customer or employee and the type of account willing to open such as current account, saving account, fixed deposit, recurring deposit etc. The system offers the flexibility of selecting different schemes to access the account status.

The system also has administrative part where all the calculations, login, password, answer to queries raised by the customer, allocating rate of interest and all the banking internal details are maintained at Intranet part.

As an additional feature, maturity value calculator, security established, demo to the new users, account transfer details and maturity value calculator are added.

The objective of the proposed system

- Provide a web based tool for the users to enroll an account and automated checking process of account status.
- To serve as an information provider regarding the available account types and their details.

-
- To provide a flexible and independent tool so that, frequent modifications to the account scheme can easily adopted.
 - To serve as a reference manual to the bank staff also.
 - To serve as additional tool in the web page of the bank and making Net banking more user-friendly.

The proposed system can be divided into two main modules.

⇒ Internet part: -

This module is used by any users who want to register an account or already registered users.

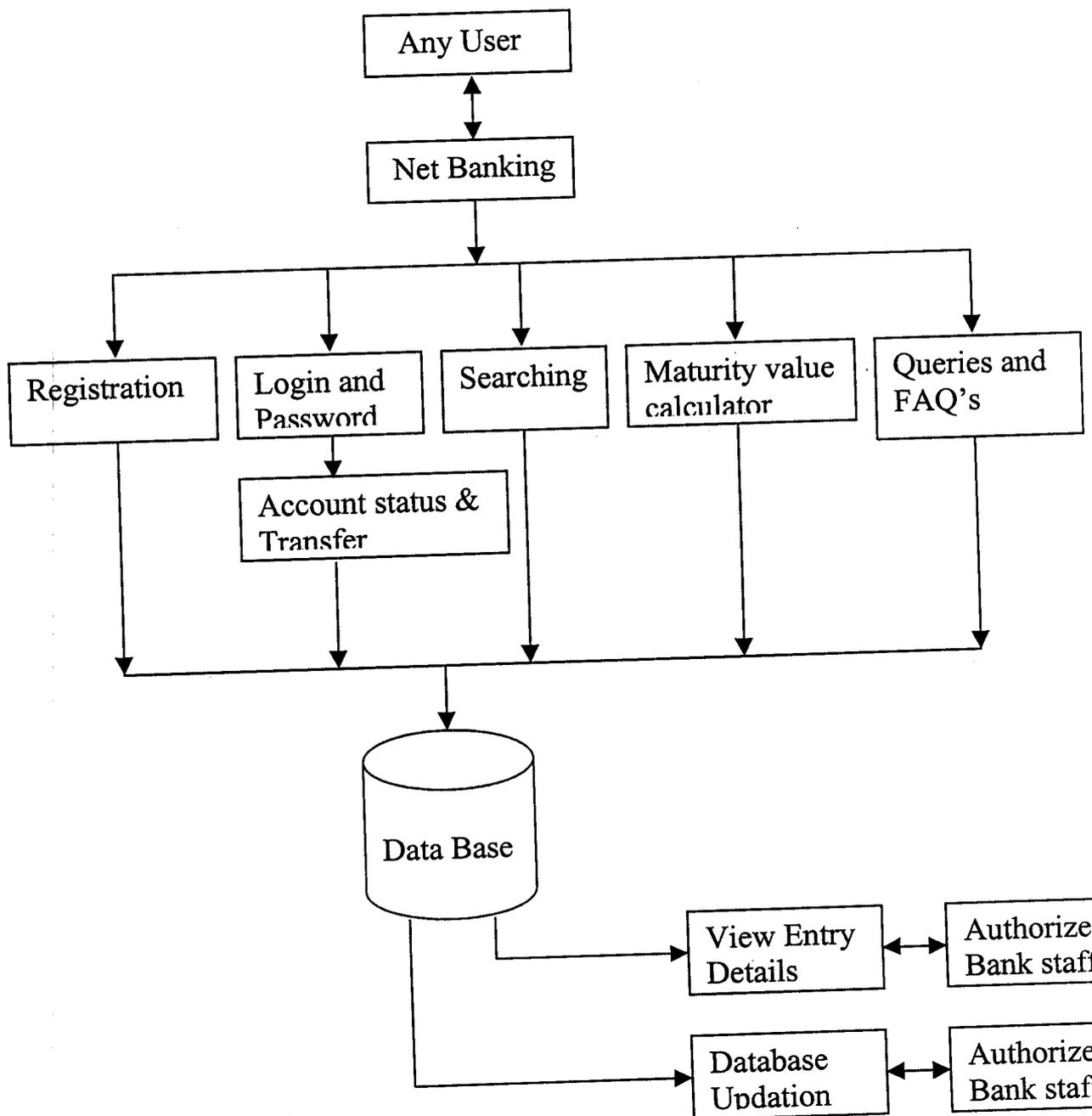
⇒ Intranet part: -

This module is used only by the authorized bank staff to update the database that consists of new user's account enrollments.

The Internet part module can further be divided based on the type of account a customer chooses

- Account registration
- Validation of already registered users
- Account status checking
- Searching
- Security
- Maturity value calculation
- Demo
- Account transfer details
- FAQ
- Contact

The whole proposed system can be represented by the following block diagram



1. Registration:

There is optional input when the Net banking tool is used through the Internet. Registration form for new users and for already registered user there is a login and password. This is validated each time the user logs into the bank account.

2.Account types:

The user has to choose the type of account to open,

- Current account
- Saving account
- Fixed deposit
- Recurring deposit

Each account has its own characteristics for example current account is similar to saving account only difference is in their interest rates and years of account holding and maintenance. This can be opened at any time and closed at time and high rate of interest will be charged.

$$\text{Amount} = \frac{\text{Initial deposit} * \text{Number of years} * \text{rate of interest}}$$

100

Fixed deposit cannot be withdrawn unless the validity period has finished. In recurring deposit the amount after first unit of time becomes the principal for the second unit, the amount after second becomes the principal for the third and so on. And interest rates calculated Annually, Half yearly and quarterly.

$$\text{Amount} = \text{Initial deposit} * [1 + r/100]^{\text{Number of year}}$$

3. Maturity value calculator:

This is a tools integrated with the Net banking software. This is can be used by both user and bank administration. It provides the estimating amount incurred for a given period of time, deposit and the rate of interest. This will reduce the manual calculations to the customer.

4. Searching and Queries:

The searching facility available in the proposed system is used to search for terms used in the project. And query section is providing a way to interact with the bank via the Internet. Any customer can send their doubts or needs an explanation to the new scheme introduced to the bank and the bank administration will give the relevant answers in their web page.

Flexibility in the proposed system

Since the Net Banking is to be used in the web, it is designed to accept any type of inputs. These inputs are validated appropriately. If none of schemes are selected or invalid input is given the system will deny to access. Account transfer from one type to other is possible. When a customer has any doubts regarding the terms and conditions he need go to bank he can rise the question and get the answer within 24 Hrs.

2.3 REQUIREMENT ON NEW SYSTEM

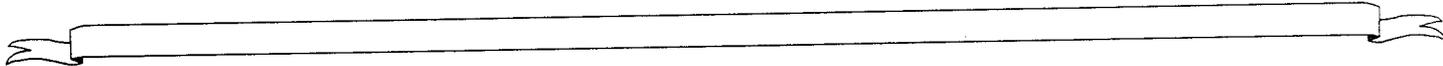
Since this is a computer era every thing is done just at the click of mouse. The system NET BANKING is one, which replaces the physical transaction of money from one place to other place. The user can access his account any where in the world at any time. He need not go to bank and check the account status.

If someone wants to buy product through the Internet he should have account in any bank providing account access through the net. Now every one is willing to buy things through the net due to lack of time. Net banking saves the time from direct bank accessing and direct purchasing.

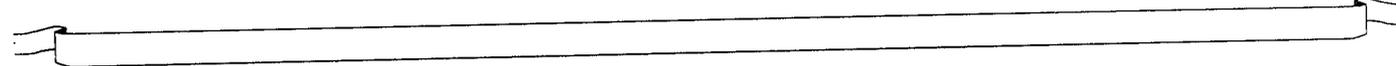
2.4 USER CHARACTERISTIC

It is purely user friendly like visual view of the current status of different accounts, account opening and all bank related activities are done by using the GUI concepts. Automated calculations for interest rates and fetching user entry details. User has to just open his Id with password, the software generates everything automatically regarding the customer account and his status.

The users need not to have a good knowledge in computer. He should know the basic operations of the computer. All the complications are hidden from the user.



Programming environment



3.PROGRAMMING ENVIRONMENT

3.1 HARDWARE SPECIFICATION

Machine	:	PC/AT
Processor	:	PENTIUM 333 MHz
RAM	:	32 MB
Hard Disk	:	2 GB
Floppy Drive	:	1.44 MB
Monitor	:	VGA Color Monitor
Key board	:	104 key Windows

3.2 DESCRIPTION OF SOFTWARE AND TOOL USED

Operating System	:	Windows 95/98
Browser	:	IE 5.0/Netscape Navigator 5.0
Backend	:	MS Access 98
Web Server	:	Java Web Server/Servletrunner
Package	:	JSDK2.0, JDK1.2, JDBC-ODBC Driver

3.2.1 FEATURES OF SOFTWARE:

Java overview:

Java has caused more excitement than any development on the Internet. People are excited about Java because of what it lets them to do. Java was the first way to include inline sound and animation in a web page, music that plays in the background on a page, cartoon style animation, real-time video, multiplayer interactive games and much more.

However Java is more than just a web browser with special features, we can also develop standalone applications, which incorporate all the features of the web and a very effective way of communicating with remote areas of different servers.

WHAT MAKES JAVA SPECIAL?

Java is a programming language for distributed applications. Java is platform independent. Java program can run equally well on any architecture that has a Java enabled browser.

Java isn't for web sites. Java is programming language that lets us do almost anything we can do with a traditional programming language like c++. It is considerably cleaner and easier than those languages.

Unique Specialties of Java:

- ✓ Platform Independent.
- ✓ Browser Independent.
- ✓ Easy to debug.
- ✓ Supports Interoperability.
- ✓ Purely object oriented.
- ✓ Multi - threaded.
- ✓ Portable.
- ✓ Interpreted language.

Features of Java Language:

*** Simple:**

Java has the bare bone functionality needed to implement its rich set. It is similar to C/C++ and many features of object oriented C++. Also some confusing concepts of C++ are either left out or written in a cleaner way in Java.

*** Object Oriented:**

Almost everything in Java is a class, a method or an object. Only the most primitive operations and data types are at a sub-object level. Although influenced by its predecessors, Java was not designed to be source code

compatible with any other language. One outcome of this was a clean, usable, pragmatic approach to objects.

*** Distributed:**

It has an extensive library of routines for copying easily with TCP/IP protocols like HTTP, FTP. Java applications can open and access objects across the net via URL's with the same ease that the programmers are used to when accessing local file system. The original version of the Java (oak) included features for intra address space messaging. This allowed objects of two different computers to execute procedures remotely. Java has recently revised these interfaces in a package called Remote Method Invocation.

*** Interpreted and High Performance :**

The Java interpreter can execute Java byte code directly on any machine to which the interpreter has been ported and linking is a more incremental and lightweight process, the development process can be much more rapid and explanatory. Java enables the creation of the cross platform programs by compiling into an intermediate representation called Java byte code. This code can be interpreted in any system that provides a Java runtime. Java runtime systems that do this just-in-time optimization lose none of the benefits of the platform neutral code.

*** Robust:**

The multiplatformed environment of the web places extraordinary demands on a program, because it must execute reliably in a variety of systems. Thus the ability to create robust programs was given a high priority in the design of Java. To gain reliability, Java restricts you in a few key areas to force you to find your mistakes early in the program development. Because Java is a strictly typed language, it checks your code at compile time. Java is intended for writing programs that must be reliable in a variety of ways. Java puts a lot of emphasis on early checking for possible programs, later dynamic checking and eliminating situations that are error prone.

*** Secure:**

Java code can be executed in an environment that prohibits it from introducing viruses, deleting or modifying files, or otherwise performing data destroying and computer crashing operation.

*** Architecture Neutral:**

Java was designed to support applications on networks. In general, networks are composed of variety of systems with a variety of CPU operating system architecture. To enable an application to execute anywhere on the

network, the compiler generates an architecture neutral object file format of the compiled code, which is executable on many processors, given the presence of a Java runtime system.

*** Portable:**

Being architecture neutral is a big chunk of being portable, but there is more to it than that. Unlike C/C++ there is no implementation dependent aspect of the specification. The sizes of the primitive data types are specified, as is the behavior of arithmetic on them.

*** High Performance:**

Java can be compiled on the fly with a just-in-time compiler to code that rivals C++ in speed.

*** Multi-threaded:**

Java is inherently multi-threaded. A single Java program can have many different things processing independently and continuously. Java was designed to meet the real world requirements of creating interactive networked programs. The Java runtime comes with an elegant yet sophisticated solution for multiprocess synchronization that makes it possible to construct smoothly running interactive system.

*** Automatic garbage-collection:**

Java interpreter manages the memory. The runtime environment keeps track of the references to each other on the heap and automatically frees the memory occupied by objects that are no longer referenced. Garbage collection run as a thread in the background and cleans up during CPU inactivity.

*** Platform Independent:**

Interpreters on many platforms compile Java programs to a byte code format that can read and run. The heart of Java is the Java Virtual Machine. The JVM enables Java programs to be executed on a variety of platforms as opposed to only the one platform for which the code is compiled. It provides a layer of abstraction between the compiled Java program and the underlying hardware platform and operating system.

*** Dynamic:**

Java programs carry with them substantial amounts of run time information that is used to verify and resolve accesses to objects at runtime. This makes it possible to dynamically link code in a safe and expedient manner.

3.2.2 CHARACTERISTICS OF SOFTWARE:

What is the Internet?

The Internet or "Inter Network" is a collection of co-operating computer networks. The goal of internetworking is to let many networks inter-operate, enabling computers to communicate with each other. The networks that constitute the Internet use many types of networking technology, different network protocols and a variety of computers. Furthermore, the networks are owned by thousands of independent organizations and individuals, governments, universities, corporations and other groups. Getting such diverse and disparate systems and organizations to work together is the primary objective of Internet. The decentralization and use of public protocols for communication achieve Internet.

Gateway, Router and Protocol:

Internet requires connecting together different and frequently incompatible networks, sometimes by using machines called gateways to make connection and provide the necessary translation, both in terms of hardware and software. Thus a gateway is a combination of hardware, software, and network connections that provide a link between one

architecture to another. A router is one kind gateway. Examples of some gateways are application gateways, e- mail gateways, protocol gateways, etc.

A protocol is a set of conventions or rules for how communicate. Every computer that correctly follows the conventions will be able to work with all the other computer those that use the protocol.

TCP/IP Protocol:

Several network protocols are responsible for transmitting data across the Internet. The key protocol for Internet is TCP/IP (Transmission Control Protocol / Internet Protocol) IP is the major protocol, and TCP is one of the several that work on top of IP to make the Internet work. The IP protocol manages the transfer of data across physically diverse networks.

Internet services:

Internet is built out of layers, with each layer depending on the ones below it. Some of the Internet services are Electronic mail, telnet, FTP, etc. Each service is a protocol that relies on the lower layer: DNS, TCS and IP.

Web:

The Web (World Wide Web), in one sense, is another Internet service. The Hyper Text Transfer protocol (HTTP) is a set of rules for making and fulfilling web requests and any program that implements HTTP can use the web. But the web distinguishes itself from other Internet protocols because it is designed to encapsulate other protocols including FTP, Gopher, WAIS, NNTP and Telnet. This makes the Web a still higher layer application, running on top of Internet application.

Web sites:

A web site is a collection of web pages at the same location. Web pages are created using HTML.

Html:

HTML stands for HyperText Markup languages, which is an application of Standard Generalized Markup Language (SGML). It is a simple language used to define and describe the layout of a Web page. HTML also supports Multimedia and document links. It consists of special codes which when embedded in text, adds formatting. The special characters, which separate HTML from ordinary text, are the left and right brackets (<&>). These brackets contain instruction known as TAGS that are not case sensitive.

HTML Elements:

HTML comprises three major elements that render a well-structured look for a document. Some of these elements are optional.

- Head
- Body
- Footer

The first tag `<HTML>` is used to identify an HTML document. The entire document is written inside `<HTML>...</HTML>` tags. Title for the document can be included using `<TITLE>...</TITLE>` tags. It also includes another set of tags namely `<HEAD>...</HEAD>` to physically identify the head of the document and to define page level information about the documents.

The next element namely, the Body will contain the entire content for the web page. The content is enclosed within `<BODY>...</BODY>` tags. To add images, links (to link to other web pages) to our web pages we can use `` and `<A>` tags well within the document's body.

Within the body, HTML footer can be included. It does not have any special tag as it is mainly used to identify document content, URL of the

page, the date when it is prepared, the version number, author's name, address, email, phone number and other details. They can be appended at the end of the web page body. HTML provides special tags with unique font and font attributes to include this information and other font and formatting purposes.

There are also tags available for table definition, Ordered and Unordered lists and a special tag that enables the users to interact with the Web Server named `<FORM>` tag. With this special feature, users can enter information in Web page and send to the server.

The FORM tag consists of two attributes namely, ACTION and METHOD. The ACTION attribute specifies the URL or file which indicate the CGI, Servlet, Perl, ASP, etc. This script will collect FORM data. The METHOD attribute indicates the method of sending information to the server when the form is submitted.

The FORM includes the INPUT tag to define the type of data entered in the form and to create web pages with graphical user interfaces like buttons, radio-buttons, check boxes, text fields, text areas and choices. Another special tag is the APPLET tag, which executes a Java applet.

Why Java is important to the Internet?

The Internet helped catapult Java to the forefront of the programming, and Java in turn has had a profound effect on the Internet. The reason is quite simple. Java expands the Universe of objects that can move about freely in cyberspace. In a network there are two very broad categories of objects that are transmitted between the Server and the computer; passive information and dynamic, active programs. When downloading a program the program code is still passive information. However there is a second type of information that can be transmitted to your personal computer, a dynamic self-executing program. Such a program will be active on the client computer, yet the server would initiate it.

Java can be used for developing two types of program, applications and applets. An application is a program that runs on your computer, under the operating system of the computer. That is, an application created by Java is more or less like one created using C and C++. When used to create applications, Java is not much different from any other computer language. Rather, it is Java's ability to create applets that makes it important.

ODBC (Open Database Connectivity) :

ODBC is Microsoft's implementation of a CLI (Call level interface). It allows the programmer to develop, compile and deploy an application without targeting a specific DBMS. Modules called drivers link the application to the database of their choice. ODBC allows maximum interoperability. The availability of all specific drivers for almost all-relational database management systems has determined its success. The JDBC mechanisms are more or less similar to ODBC but adapted to Java.

THE ODBC INTERFACE:

The ODBC interface defines a library of function calls that allow an application to connect to a DBMS, execute SQL statements, and retrieve results. Its syntax is based on the X/ Open and SQL Access Group SQL CAE specification, which defines a standard set of error codes and so on.

DATABASE INTERGRATION WITH JDBC:

Java is an object oriented programming language, and the problems of impedance mismatch between structured query language and object-oriented language have been minimized.

The role of JDBC:

The JDBC interface provides the application with a set of methods that enable database connections, queries and result retrievals. It is the interface between the specific database drivers and the Java user applications, applets or servlets.

JDBC Characteristics:

JDBC is a "call-level " SQL interface for Java. This interface is totally independent of the available database management systems.

SQL conformance:

JDBC does not restrict the type of queries passed to an underlying DBMS driver. JDBC may be implemented on top of common SQL level APIs, in particular on top of ODBC. JDBC provides a Java interface that stays consistent with the rest of Java systems. There are no conflicts. The JDBC mechanisms are simple to understand and use. This simplicity does not mean that functionality suffers.

JDBC COMPONENTS:

Application:

The user application invokes JDBC methods to send SQL statements to the database and retrieve results.

Driver Manager:

Its primary purpose is to load specific drivers for the user application.

Driver:

The driver processes JDBC method invocations, sends SQL statements to a specific data source, and returns back to the application.

Proprietary Database Drivers:

They process JDBC calls and send SQL statement to the data source. They may be "Native API partly-Java" or "Native-protocol-Java".

Bridge drivers:

This driver creates a bridge between JDBC and another call level interface (CLI). For example JDBC- ODBC driver is a bridge driver.

DBMS-independent all-Java Drivers:

These drivers use DBMS a independent published network protocols.

Data Source:

The data source consists of the data the user application wants to access and its associated parameters i.e., the type of DBMS and network layer used to access the DBMS.

OVERVIEW OF SERVLETS:

The Internet serves as a complete client/server solution where programs are dynamically downloaded onto the client. Till now the focus has been on the client-side developments of applets and GUI components, which is incomplete as far as client/server computing is concerned. Hence the need for server side programming- the Servlets. Also to make information stored in a database accessible to the browsers through Web pages requires dynamic processing.

In early days of the Web, a server could dynamically construct a page by creating a separate process to handle each client request. The process would open connections to one or more databases in order to obtain the necessary information. It communicated with the Web server via an interface known as the common gateway interface (CGI) CGI allowed the separate process to read data from the Http request and write data to the HTTP response. A variety of different languages were used to build CGI programs using C, C++, and Perl.

WHY SERVLETS INSTEAD OF CGI?

CGI suffered serious performance problem. Creating a separate process for each client request was expensive, in terms of processor and memory resources. It was also expensive to open and close database connections for each client request. In addition, the CGI programs were not platform-independent. Therefore, other techniques were introduced, including servlets.

Servlets offer several advantages over CGI; Performance is significantly better. Servlets execute within the address space of a Web server. Creating a separate process to handle each client request isn't necessary. Servlets are platform independent, because they are written in Java. Several Web servers, from vendors such as Sun Netscape, and Microsoft, offer the Servlet API. Programs developed for this API can be moved to any of this environment without recompilation.

The Java security manager on the server enforces a set of restrictions to protect the resources on a server machine. The full functionality of the Java class libraries is available to a servlet. It can communicate with applets databases, or software via the sockets and RMI mechanisms.

WHAT ARE SERVLETS?

A servlet can be defined as a mini server-side program, similar to an applet. Servlets are loaded and executed by a Web server in the same way as applets. A servlet accesses requests from the client, performs some task and returns results.

Practical Applications for Java Servlets:

Servlets can be used for any number of web-related applications. When you start using servlets, you will find more practical applications for them. Developing e-commerce "store fronts" will become one of the most common uses for Java servlets. A servlets can build an online catalog based on the contents of a database. It can then present this catalog to the customer using Dynamic HTML. The customer will choose the items to be ordered, enter the shipping and billing information, and then submit the data to a servlets.

Servlets can be used to deploy Web sites that open up large legacy systems on the Internet. Many companies have massive amounts of data stored on large mainframe system. These businesses do not want re-architect their systems, so they choose to provide inexpensive Web interface into them.

When developing a distributed object application that will be deployed to the Web, you run into access issues. If you choose to use applets in your client browser, you are only able to open a connection to the originating server, which might be behind a firewall.

Reasons to use Java Servlets

Servlets are efficient, persistent, portable, robust, extensible, and secure and they are receiving widespread acceptance. Servlets solve many of the common problems you run into when using CGI, and they prove to have a clear advantage over many of the other alternatives.

Efficient

A servlet's initialization code is executed only the first time the Web server loads it. After the servlets is loaded, handling new requests is only a matter of calling a service method. This is a much more efficient technique than loading a completely new executable with every request.

Persistent

Servlets can maintain state between requests. When a servlet is loaded, it stays resident in memory while serving incoming requests. A simple example of this would be a Vector that holds a list of categories used in an online catalog. When the servlet is initialized, it queries the database for a list of categories and stores these categories in a Vector.

Portable:

Servlets are developed using Java; therefore, they are portable. This enables servlets to be moved to a new operating system without changing the source. You can take code that was compiled on a Windows NT platform and move it to a Solaris box without making any changes.

Robust

Because servlets are developed with access to the entire JDK, they are very powerful and robust solutions. Java provides a very well defined exception hierarchy for error handling. It has a garbage collector to prevent problems with memory leaks. In addition, it includes a very large class library that includes network support, file support, database access, distributed object components, security, and many other classes.

Extensible

Another advantage servlets gain by being developed in an object-oriented language like Java is they can be extended and polymorphs into new objects that better suit your needs. A good example of this is an online catalog. You might want to display the same catalog search tool at the top of very dynamic page throughout your Web sites.

Secure

Servlets run on the server side, inheriting the security provided by Web server. Servlets can also take advantage of the Java Security Manager.

Widespread Acceptance

Because of all there is to be gained from using Java servlets, they are being widely accepted. Vendors are providing servlets support in two main forms. The first is a server that has built-in support for servlets, and the second is by using third-party add-ons.

The Java Servlet Architecture

Two packages make up the servlet architecture: the *javax.servlet.http*. The *javax.servlet* package contains the generic interface and classes that are implemented and extended by all servlets. The *java.servlet.http* package contains the classes that are extended when creating HTTP- specific servlets. An example of this would be simple servlet that responds using HTML.

At the heart of this architecture is the interface *javax.servlet.Servlet*. It provides the framework for all servlet. The Servlet interface defines five methods. The three most important are *init ()* method that initializes a servlet, the *service ()* method that receives and responds to client requests, and

destroy () method performs cleanup. All servlet must implements this interface, either directly or through inheritance. It is a very clean object-oriented approach that makes it very easy to extend.

Working of servlets:

- The client makes a request.
- The Web server forwards the request to the servlet after receiving it from client.
- Some kind or process is done by the servlet after receiving the HTTP request.
- A response is returned back to the web server from the servlet.
- The Web server will forward the response to the client.

SCRIPTING LANGUAGES:

Scripting is not a new technology. Various types of scripting existed for years in a wide range of applications. One of the most important things to remember about scripting languages versus more mainstream programming environments; Scripts function within applications. Now all the browsers are scripts enabled; Scripts have come to play a pivotal role in the evolution of the web.

JAVA SCRIPT:

Netscape communicator 4.0 introduced Java script 1.2 third major version of Netscape's popular client side scripting language. With each successive release, Java script has become more powerful and flexible.

Java Scripts is a lightweight interpreted programming language with object-oriented capabilities. The general-purpose core of the language has been embedded in Netscape navigator. Java Scripts is a general-purpose programming language; its use is not restricted to Web browsers and Web servers.

Both Netscape and Microsoft have made their JavaScript interpreters available to companies and to programmers that want to embed them in their applications. When a web browser is augmented with a JavaScript interpreter, it allows executable content to be distributed over the Internet in the form of JavaScript's scripts.

Client Side JavaScript Features:

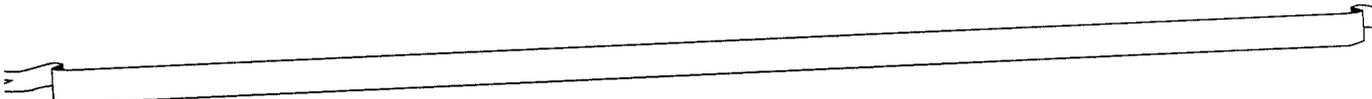
Java Script can:

- Controls document appearance and content.
- Controls the browser.
- Interacts with HTML forms.
- Interacts with user.
- Read and write client state with cookies.
- Interacts with Java applet and other embedded objects that appear in the browser.
- Data object simplifies the process of computing and working with dates and times.
- Document object supports a property that specifies that last modified date for the current document, which is used to display a timestamp on any document automatically.
- `Window.setTimeout ()` method allows a block or arbitrary JavaScript code to be executed some number of milliseconds in future.

-
-
- Navigator object has variable that specify the name and version of the browser that is running, as well as the variable that identify the platform it is running on. These variables allow scripts to customize their behavior based on browser or platform, so that can take advantage of extra capabilities supported by some versions or work around bugs that exists on some platform.
 - Screen object provides information about size and color-depth of the monitor on which the web browser is being displayed.
 - The scroll() method of the Window object allow JavaScript programs to scroll windows in the X and Y dimensions.



System design and development



4. SYSTEM DESIGN AND DEVELOPMENT

4.1 INPUT DESIGN

The input design is the link that ties information system into the world of its users. Input design consists of developing specification and procedures for data preparation, steps necessary to fit transaction data into a form that is usable for computer processing.

The input design pertaining to the Net Banking system can be of two classes namely are to be hosted as a web page and the other to the bank staff to update the databases. The input screens are designed as to serve the objectives such as effectiveness, accuracy, simplicity and attractiveness.

The input screens of this system are designed using HTML and all data validation is done using JavaScript. The screens are described as follows.

Registration:

This screen consists of inputs personal details of the customer, account type, initial payment and number of years. This is presented in attractive colors so that the user feel more interested in entering these items.

Login and Password:

This screen consists of login and password for already registered user.

Queries:

This screen consists a text box where the user can submit their questions and doubts regarding the terms and condition and anything which does not know by him.

Loan calculator:

This screen consists of deposit amount, rate of interest, compounding factor (Quarterly or Half early) and deposited period in months. And two buttons are available to compute the amount and reset.

Database updation:

This screen comes under the Intranet part where the bank staff can update the database based on the user input namely allocating user id and password, interest rate, credit and debit in the appropriate account and submitting answers to the queries. The inputs are got using text boxes and labels neatly aligned.

4.2 OUTPUT DESIGN

One of the most important features of an information system for users is the output it produces. Output is information delivered to users through the information system. Without quality output, the entire system may appear to be unnecessary that users will avoid using it.

The output design of this system is done so that the output screen consists of all the necessary details presented in an attractive and easy readable form.

1. Conformation:

This screen consists conformation details when a customer completes his registration form to open an account in a bank. This will contain all the necessary information to be followed by the customer after the enrollment of an account.

2. Question and answer:

This screen consists answers to the questions raised by the end-user. This outputs are shown in the textboxes and labels aligned neatly.

3.Account status:

This screen consists of the account status of a particular customer who has login into the account. The account status consists of name, account type, initial deposit, balance, date, current deposit, current transaction and current balance.

4.3 DATABASE DESIGN

All the details of the Net banking are stored in the database. The following are descriptions of the tables.

1.Customer :

This table stores the personal details of the customer and the account type, deposit amount and period.

S.No	Field name	Description	Data type
1	Customer_id	Customer identification No.	Auto number
2	Applicant	Name of the applicant	Text
3	YMD1	Date of birth	Date
4	Flat1	Address	Text
5	Society1	Address	Text
6	Road1	Address	Text
7	Area1	Address	Text
8	City1	Address	Text
9	Tel1	Telephone Number	Number
10	JointApplicant	Joint applicant in Bank	Text
11	AccountType	Type of Account	Text
12	Pay1	Initial deposit	Currency
13	Year11	Number of Years	Number

2.Employee

This table contains the details of the employees.

S.No	Field name	Description	DataType
1	Employee_code	Employee code	Auto number
2	CompanyName	Name of the company	Text
3	Designation	Designation	Text
4	MonthlyIncome	Monthly income	Currency
5	AnnualIncome	Annual income	Currency
6	RoadName	Address	Text
7	AreaName	Address	Text
8	CityName	Address	Text
9	TelNumber	Telephone number	Number
10	Customer_id	Foreign key to Customer	Number

3.Account

This table contains account information of all customers.

S.No.	Field name	Description	Data type
1	User_id	Foreign key to Customer	Number
2	Date	Date of transaction	Date
3	Deposit	Depositing Amount	Currency
4	Transact	Transacting Amount	Currency

4.Enquiry:

This table consists of the question number and the question.

S.No.	Field name	Description	Data type
1	Question_no	Question number	Auto number
2	Question	Question raised	Text

5.Admin1:

This table consists of allocation of user_id and password.

S.No.	Field name	Description	Data type
1	Customer_id	Foreign key to Customer	Number
2	User_id	Allocated user_id	Number
3	Password	Password allocated	Text

6.Admin2:

This table consists of allocation of answer to the questions raised.

S.No.	Field name	Description	Data type
1	Question_no	Question number	Number
2	Answer	Answer	Text

7.Admin3:

This table consists of calculated amount after transactions are made.

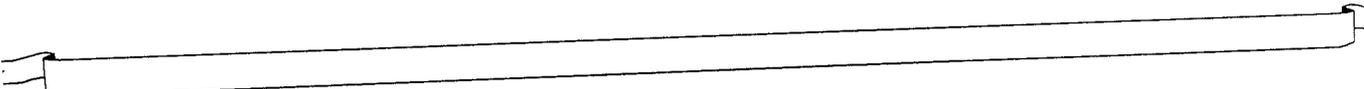
S.No.	Field name	Description	Data type
1	Customer_id	Foreign key Customer	Number
2	Deposit	Foreign key Account	Currency
3	Transact	Foreign key Account	Currency
4	Current_balance	Current balance	Currency
5	Date	Foreign key Account	Date

4.4 PROCESS DESIGN:

The next step is how the system is processing. The main activity in this phase is coding. Adequate care has to be taken while coding is being proceeded. Adequate comments are one of the very important considerations. The coding must be easily understandable as well as effective and efficient. Indentation must be provided wherever necessary. The coding can be proceeded module by module.



System Implementation and Testing



5. SYSTEM IMPLEMENTATION AND TESTING

5.1 SYSTEM IMPLEMENTATION

Once the physical system has been designed in details, the next stage is to turn the design into a working system and then to monitor the operation of the system to ensure that it continues to work efficiently and effectively.

Since "NET BANKING" consists of several modules. The modules alone cannot be implemented individually. All the other modules also have to be developed and to be integrated for the successful implementation. After thorough testing of the module then the system is ready for implementation.

5.2 SYSTEM TESTING

The development of software involves a series of production activities where opportunities for injection of human fallibilities are enormous. Because of human inability to perform and communicate with perfection, software development is accompanied by quality assurance activity.

Software testing techniques

The test case design methods applied are

- 1) White box Testing
- 2) Black box Testing

White Box Testing:

- ⇒ Using this testing method it was assured that all the independent paths were exercised at least once.
- ⇒ All the logical decisions on their true and false sides were executed.
- ⇒ All the loops were executed at their boundaries.

Black Box testing:

Using this technique incorrect and missing functions were rectified and corrected. Interfacing errors, performance errors, initialization errors and termination errors were also found using this technique.

Software testing strategies

A strategy for software testing integrates software test case design techniques into well planned series of steps that result in the successful construction of software. Any testing strategy must incorporate test planning, test case design, test execution and the resultant data collection and evaluation.

Different levels of testing

- ⇒ UNIT TESTING
- ⇒ INTEGRATED TESTING
- ⇒ VALIDATION TESTING
- ⇒ SYSTEM TESTING

UNIT TESTING

Unit testing focuses verification effort on the smallest unit of software design the module. Each of the modules specified earlier were verified individually for errors.

The unit test considerations that were taken into account are

- Interfacing errors
- Integrity of local data structures
- Boundary conditions
- Independent path
- Error handling path

INTEGRATION TESTING:

Integration testing is a systematic technique for constructing the program structure while at the same time unit tested modules were taken and program structure that was specified in the design was built and then testing was carried out. The bottom up approach was applied.

VALIDATION TESTING

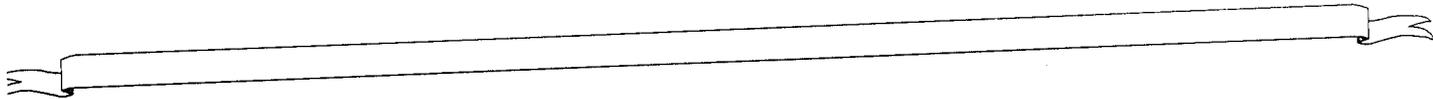
Validation test is carried out to verify whether the software functions in a manner that expected by the customer. So ALPHA testing was done to ensure validity.

SYSTEM TESTING

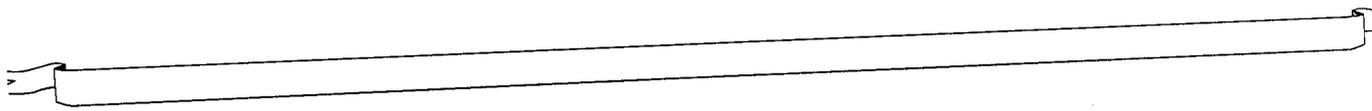
On completion of unit testing for all units corresponding to every application system undergoes system testing, wherein the integration aspect between various units of the system and the functionality of the whole application system has been tested. All errors encountered in the unit-testing phase has been corrected before entering into system testing phase.

Objectives

- To test the functionality of each unit and application system, as a whole.
- To test for the interface aspects between programs within the application system.
- To test for the integration aspects of the application system with other application system, if other application systems are already implemented and accepted.
- To test for the business function of the respective application systems.



Conclusion



6. CONCLUSION

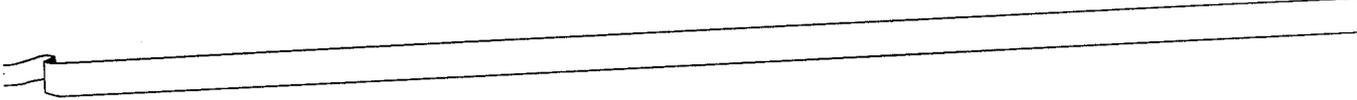
The system is developed with due consideration given to the integration with other modules of the e-banking software. The system is highly scalable, viable and user-friendly. Striking colors given to the pages have a very appealing effect. The module has been thoroughly tested and can be easily integrated with other modules. All the phase of the development was conceived using the methodologies and tool of structured system analysis and design. Areas of further improvement in this module can be identified as giving customers formatted e-mail communications, providing account statements and financial services. The entire objective are achieved with this project.

7. SCOPE FOR FURTHER DEVELOPMENT

“NET BANKING” is software of the banking. Since it is an Internet based project, modifications and updations can be done easily. At any point of time HTML pages can be attached with hyper links to the existing page. So, the scope of the project is for throughout the lifetime.

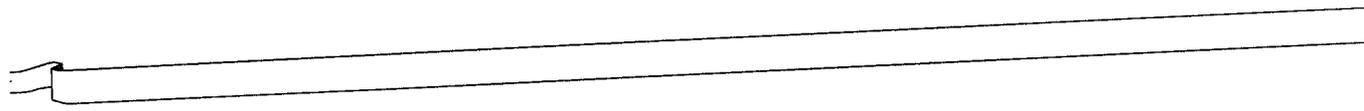


Appendices

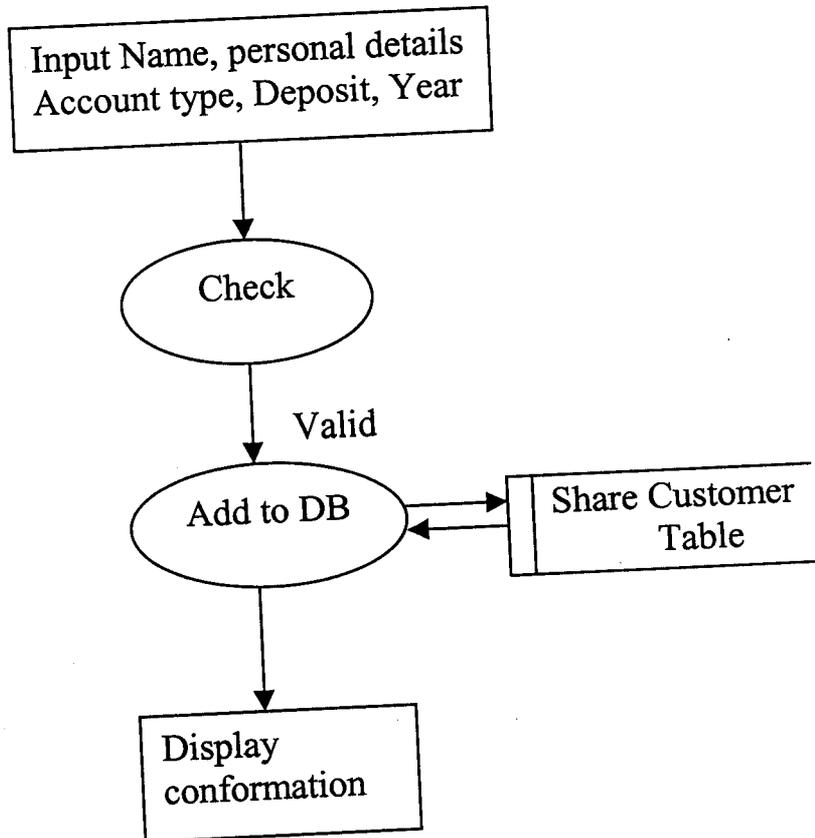




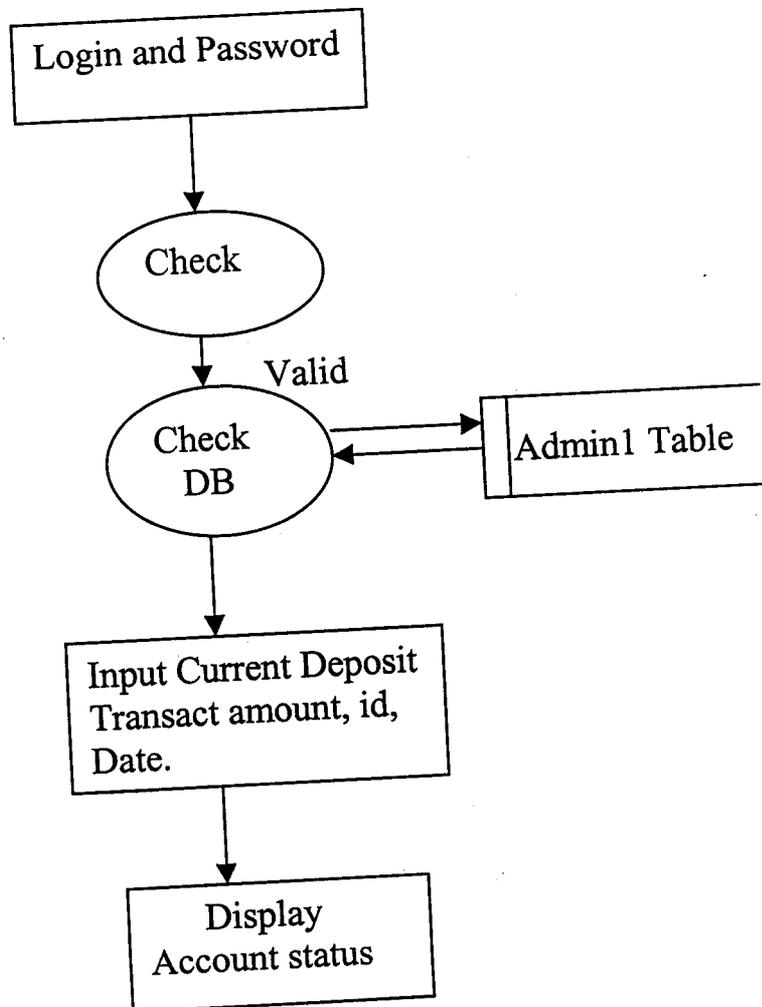
Data Flow Diagram



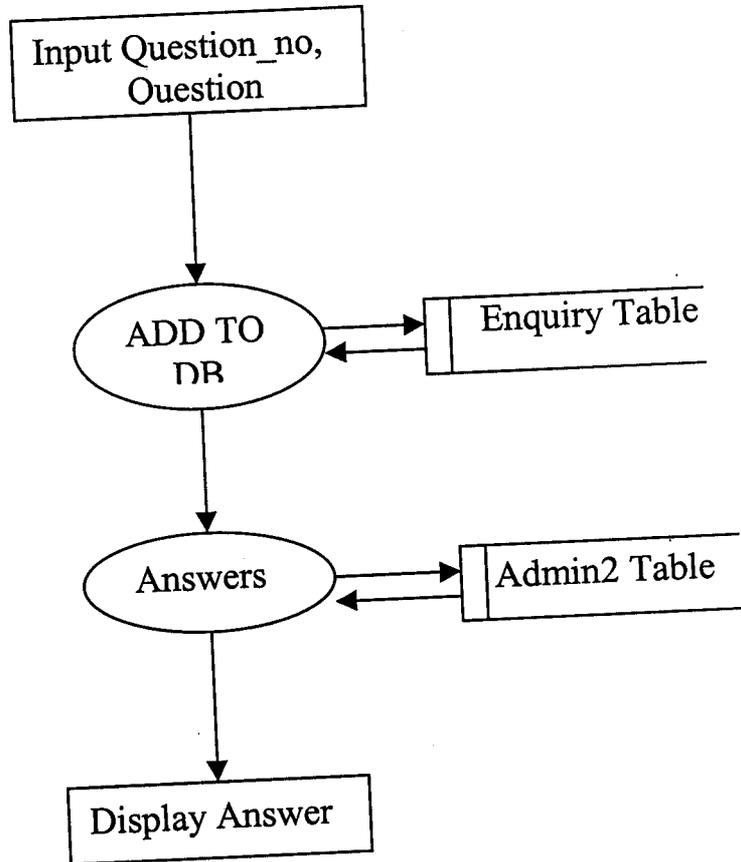
Registration



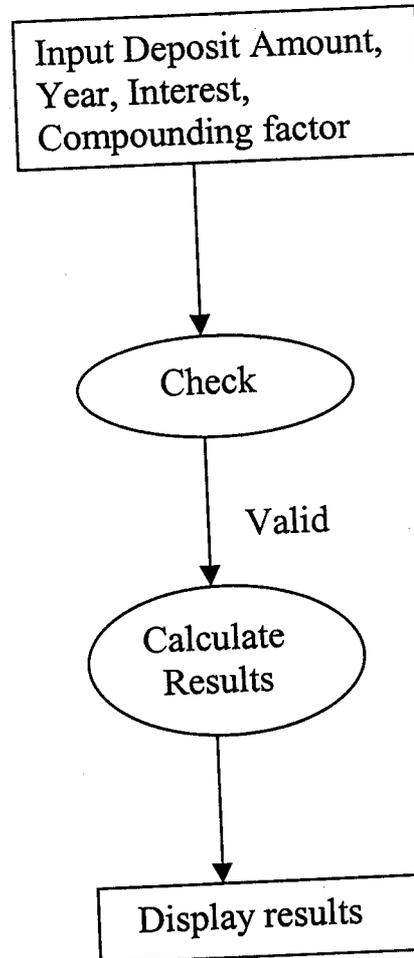
Login and Password



Queries

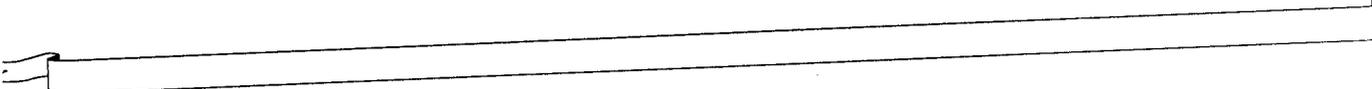


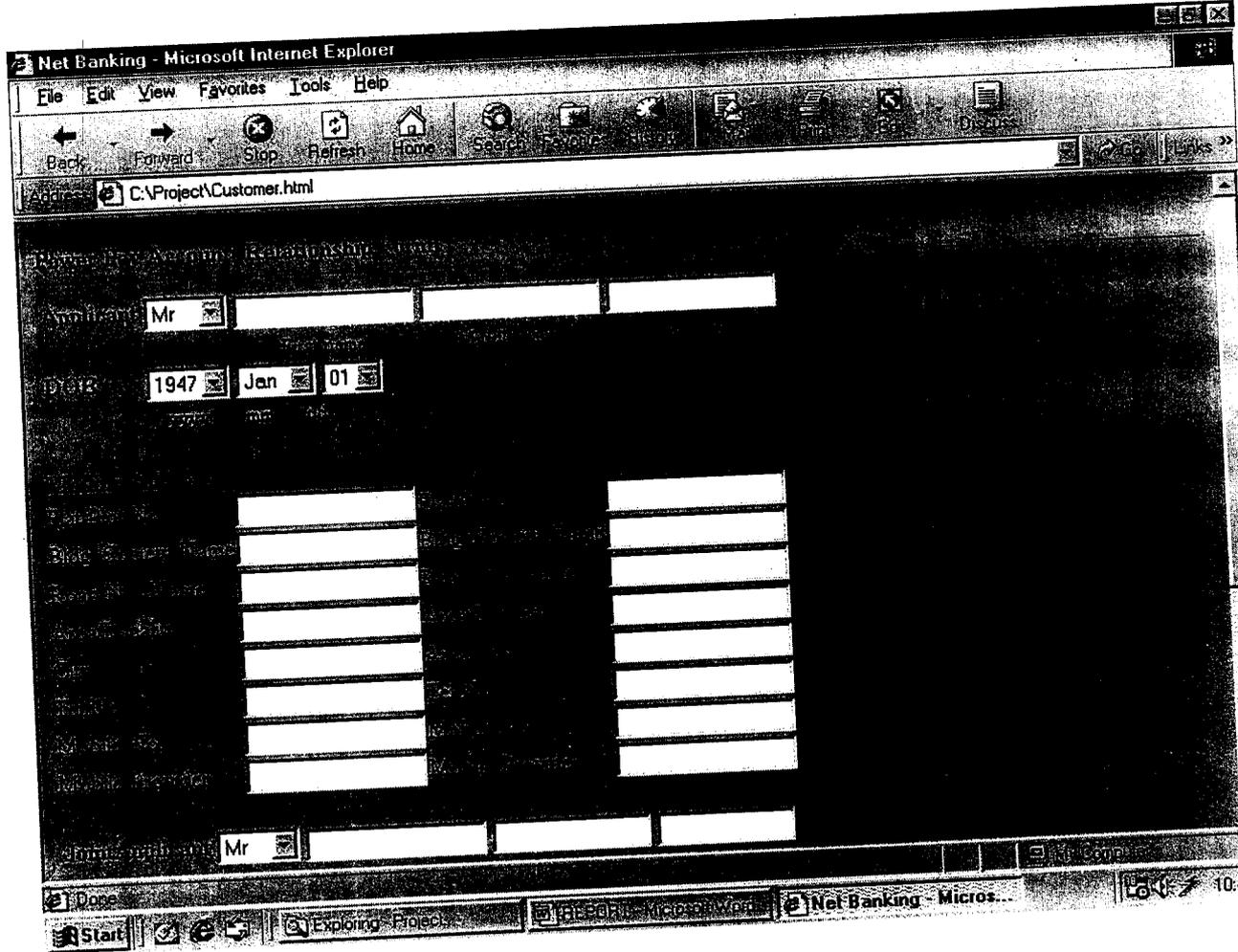
Maturity value calculator

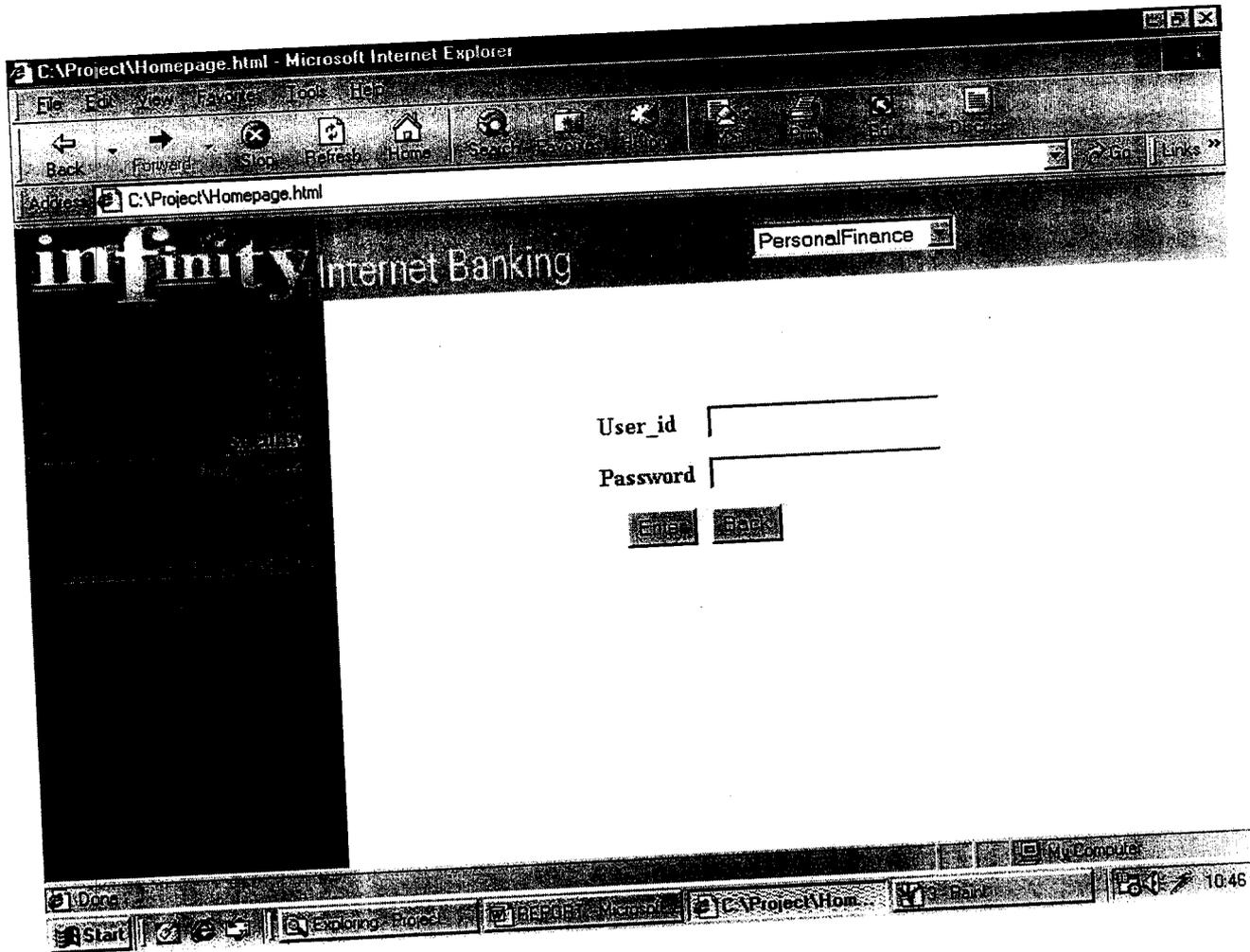


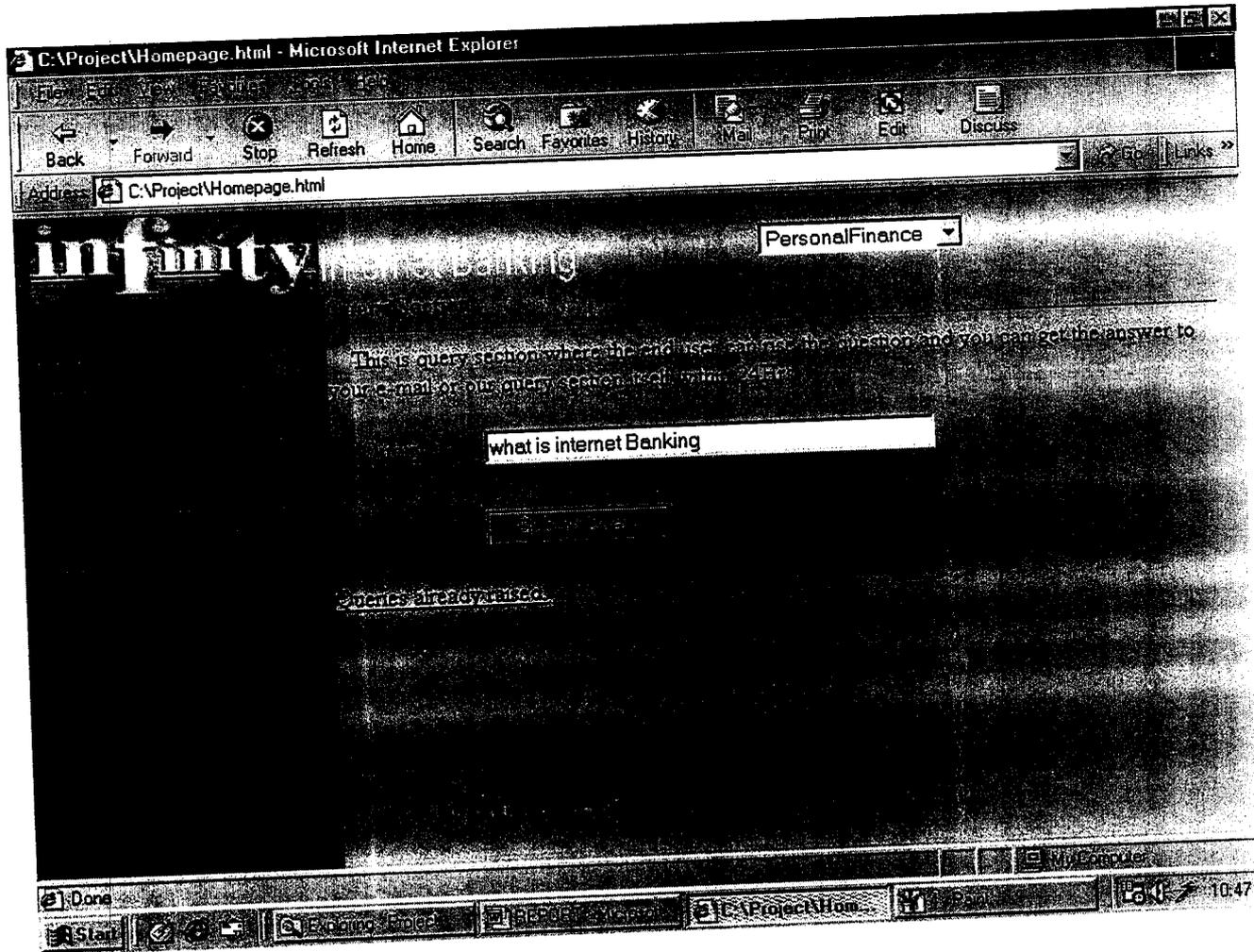


Screens









C:\Project\Homepage.html - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Refresh Home Stop Internet Options

Address: C:\Project\Homepage.html

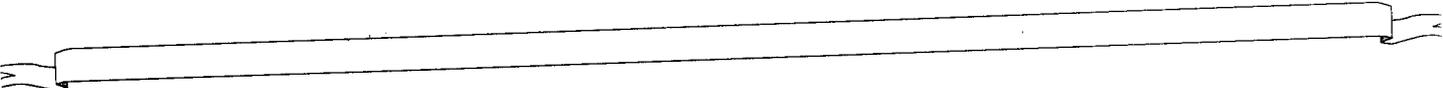
Infinity Internet Banking Personal Finance

Maturity Value Calculator

Please enter Deposit Period, Rate of Interest, Compounding Factor and Deposit Amount. Click on Compute to calculate the maturity value. You can also use the Maturity Value Calculator together with the number of years.

Maturity Value Calculator					
Deposit Period in Months	Rate of Interest	Compounding Factor	Deposit Amount	Maturity Value	
		<input type="radio"/> Quarterly <input type="radio"/> Half yearly			<input type="button" value="Compute"/>

Start | Exploring - Projec | REPORT - Microsoft | C:\Project\Hom... | 10:48



Reports



C:\Project\EandC.html - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Refresh Home Search Favorites

Address C:\Project\EandC.html

Information about you

Your Employee Code: 20
 Your Customer id: 58

Company Name wipro
Designation pm
Monthly Income 232323
Annual Income
Retail Name
Area Name
City Name chennai
Telephone

Account is been opened for Mrkanagasraj

Your Customer
Date of Birth
Joint Applicant Mrchithu
Date of Birth
Account Dept
Annual Income
Year
Mailing Address
City
State
Region
Area
City
Telephone
Account Information

Done

Start Exploring REPOB

10:50

C:\Project\Bankadmin\Index1.html - Microsoft Internet Explorer

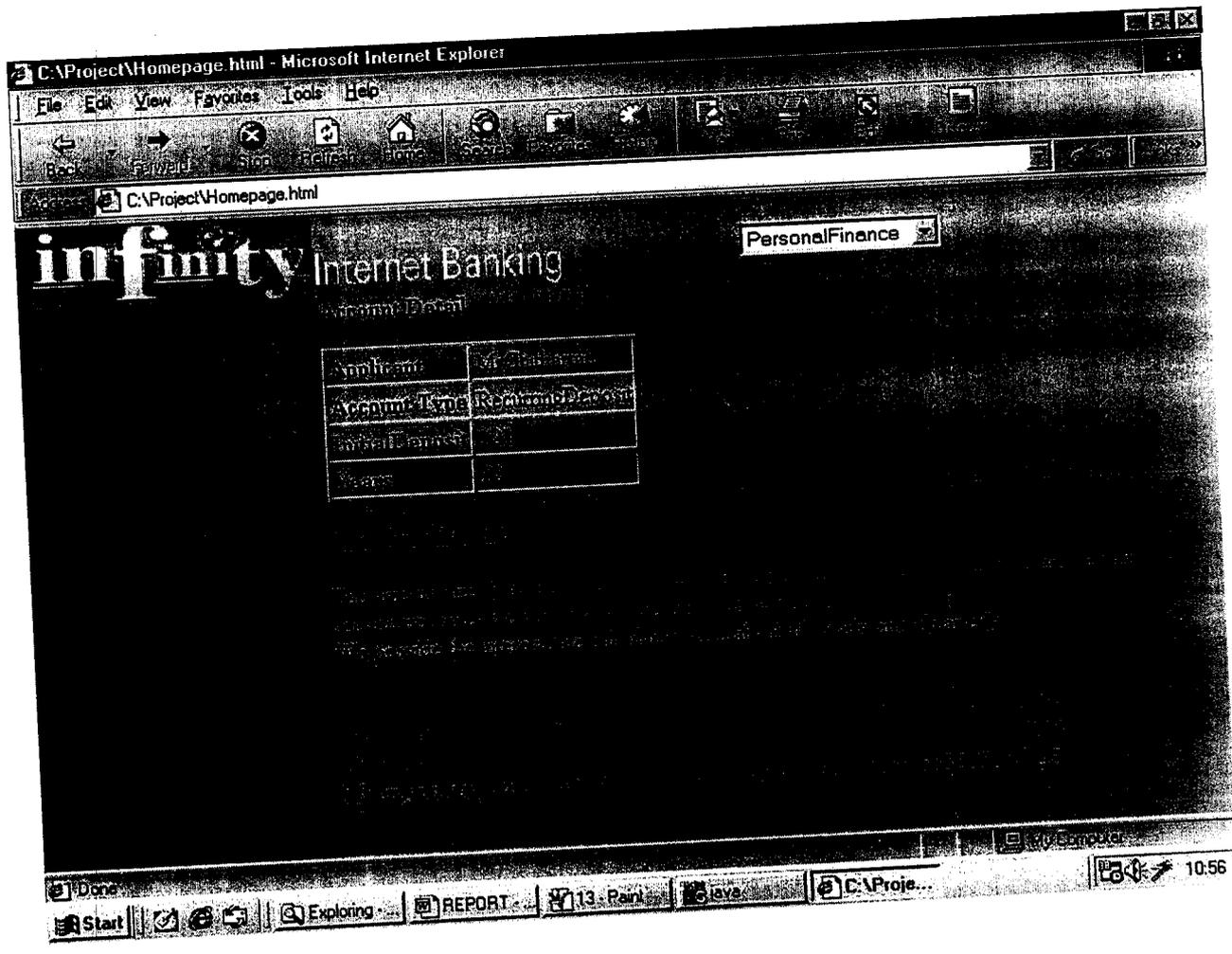
File Edit View Favorites Tools Help

Address: C:\Project\Bankadmin\Index1.html

Bank Administration Formil Requirements

Name	id	Account Type	Initial Pay	Years
Mr.Chitharan	46	RecurringDeposit		
Mrasd	47	FixedDeposit	121	12
Mr.Chitharth	48	RecurringDeposit	1234	1
Mr.Ramesh	49	RecurringDeposit	1000	2
Mr.Natarajan	50	SavingAccount	2000	3
Miss.Sudanya		SavingAccount	000	
Mr.A		RecurringDeposit		
Mr.Camasra	55	FixedDeposit	1000	

Taskbar: Stat, Explorer, H, C:\Proj..., 10:52



C:\Project\Homepage.html - Microsoft Internet Explorer

File Edit View Favorites Tools Help



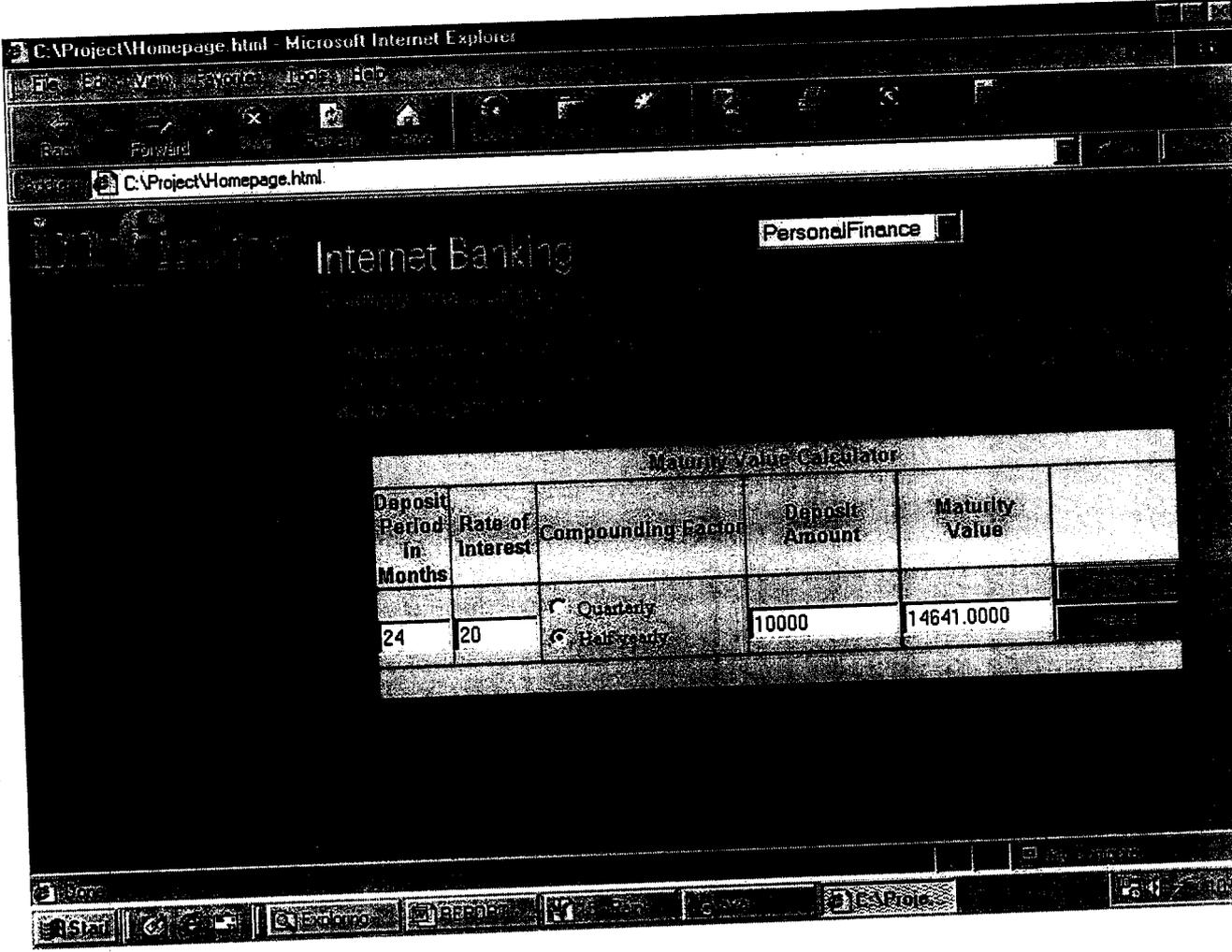
Address C:\Project\Homepage.html

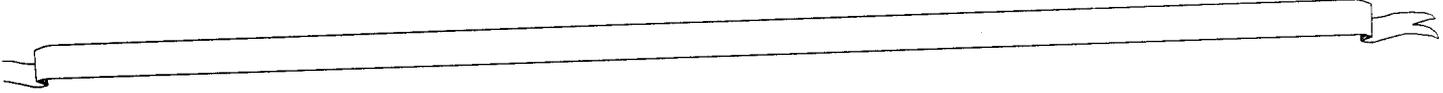
infinity Internet Banking

PersonalFinance

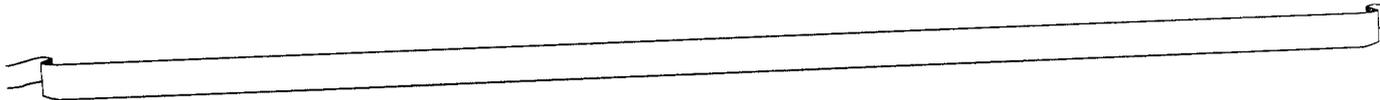
Account Type	Relationships

Done Start Exploring... REPORT... 13. Part... Java C:\Proje... 10:56





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