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# ATM TRANSACTIONS MANAGEMENT SYSTEM

By

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Of

## KUMARAGURU COLLEGE OF TECHNOLOGY

### COIMBATORE

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### CHENNAI 600 025

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# KUMARAGURU COLLEGE OF TECHNOLOGY

## COIMBATORE-641006

### BONAFIDE CERTIFICATE

Certified that this project report titled **"ATM TRANSACTIONS MANAGEMENT SYSTEM"** is the bonafide work of **MS. MYTHILY. M** (Registration Number: **71205621028**) who carried out the research under my supervision. Certified further, that to the best of my knowledge the work reported herein does not form part of any other project report or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.


**Supervisor**                                    **Head of the Department**


**Submitted to Project and Viva Examination held on** 1 - 7 - 08
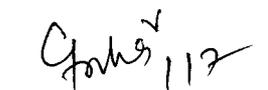

**Internal Examiner**                                    **External Examiner**

# MAPLES ESM
TECHNOLOGIES PVT. LTD.

May 2, 2008
Chennai

## Project Certificate

This is to certify that **Ms. Mythily .M** (Reg. No. 71205621028)  student of Kumaraguru College of Technology, Coimbatore was involved in the Banking Project **"Automatic Teller Machine Transactions Management System"** at our organization for the partial fulfillment of M.C.A.., She undertook this project during December 2007 to May 2008.

During this period her performance was good and we wish her the best in future.

Thank you,

**Devaraj Condoor**
Associate Vice President - Projects

one - world enterprise solutions

## ABSTRACT

**ATM Transactions Management System** is one of the major **BANKING PRODUCT** which is being widely used all over the world by several users. This ATM Transaction Management System is a computerized network which is introduced in banking application. The main aim of launching this product in the market is to make the user to do transactions in a very easier manner at ant time (i.e.) 24 hrs service. This makes the banking system also easier to work and do their transactions in **ONLINE**.

Before the introduction of this **ATM** all the transactions are done as a **BATCH PROCESS**. This change from batch to **ONLINE PROCESSING** has a lot of merits such as faster access and easier way of transaction.

The **ATM's** main criterion is its security system and its memory management. This plays an important role before designing this **ATM** architecture. As this **ATM** doesn't have any manual monitoring procedure, it has a lot security measures in it. The other criteria are its database handling which should be updated after each and every transaction. This makes the database handling also as an online updating process. The other main aspect of this project is its memory management. This is achieved through its **VIRTUAL TYPE** of storage.(i.e.) all the data's are stored in a **VIRTUAL STORAGE** space.

These are the major criteria's or situations which intended to develop the same **ATM** architecture in **MAINFRAME ENVIRONMENT**.

# ACKNOWLEDGEMENT

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# LIST OF ABBREVIATIONS

| | |
|---|---|
| **IPL** | Initial Program Load – To boot the system (load the OS ) |
| **VSAM** | Virtual storage access method |
| **ABEN** | Abnormal termination (or) end of the task / program / job |
| **JCL** | Job Control Language |
| **CICS** | Customer Information Control Systems |
| **COBOL** | Common business oriented language |
| **DB2** | Database system |
| **RACF** | Resource Allocation Control Facility |
| **JES** | Job Entry Subsystem |

# 1 INTRODUCTION

## 1.1 ABOUT THE PROJECT

The project **ATM Transactions Management System** is developed for Chaitanya Bank. The main aim of launching this product in the market is to make the user to do transactions in a very easier manner at any time (i.e.) 24 hrs service.

## VARIOUS PROCESSES IN ATM

- Connection of the account to the network.
- Maintenance of personal identification number of an account in the system for verification purposes.
- Maintenance of ATM card status.
- Maintenance of cash balance available with a particular ATM, maximum cash that can be withdrawn for a single transaction and other relevant parameters set by the bank for proper and smooth functioning of the ATM center.
- Connecting the ATM system with the banks computer and also downloading of the ATM transaction for the purpose of the day end process.

These above mentioned process is being developed and is explained in the forth coming sections viz. system requirements, functional requirements and design of the system.

## CARD NUMBER AND PASSWORD VERIFICATION PROCESS.

Before any transactions take place the customer must put the card in to the ATM machine. If the number in the card matches the number on the database, the customer is asked for the password and if it is valid the customer can continue with their transaction. If the customer fails to enter the correct number three chances will be given if the customer fails the card will be rejected and a message is sent to the bank's main computer. The verification program helps to provide security. It helps to avoid any unauthorized access of the accounts and services. Thus to provide the proper and authorized access to the account the verification process is used.

## LANGUAGE SELECTION

The user can select any language he wants the ATM machine to use. There is a choice between English, Tamil, and Hindi. The particular selection will lead him to the required Screen. The availability of language options will help the user to interact with the machine in the language the customer prefers. This makes the ATM system more user-friendly.

## ACCOUNT OPTION.

The user can enter any option he wants to use, either the current account or the savings account. The current account can be entered by users having current account. The savings account can be entered by users having savings

## SERVICE OPTION.

The user can enter any option he wants to use, he can choose between the banking services offered and the special services. The banking services offers services like Funds Transfer, cheque book Request, statement request, Pin change Request and special service is payment of fees.

## FUND TRANSFER.

Fund transfer is to transfer the the fund from one account can be transferred to another. The customer has to enter his account number of the debtor and the amount to

be transferred to the debtor. The funds from the customers account will be transferred to the debtors account.

## CHEQUEBOOK REQUEST.

The cheque book can be requested directly through the ATM machine. The user is required to enter the number of leaves of Cheque required by him. Once this information is given, the user is immediately notified that the Cheque book request has been sent to the bank and he can collect it from the bank.

## MINI STATEMENT REQUEST.

The statement can be viewed and printed out using the ATM machine. When the user wants to get details of the transactions that has taken place till date, he can use this option and obtain the transaction details. This will give the information of the transactions that has taken place starting from a fixed period.

## PIN CHANGE REQUEST.

The pin can be changed by the customer when he wants to. First he will be prompted for the new pin and he has to reenter it again for confirmation purposes. If both the pins entered are same, he will be given a message indicating the successful pin change. For the security purposes, the user will change the pin numbers periodically. This will help the user to have secured transactions.

## TRANSACTION OPTIONS.

The transaction process comprises all the banking services like Balance enquiry, payments, Mini statements, Deposit, Fast Cash, and Withdrawal. The transaction processes will each have its own Transaction ID.

## BALANCE ENQUIRY.

Balance enquiry can be obtained through this option. The user can request to view the balance amount in his account at any time.

## CREDIT CARD BILL PAYMENT.

Payment of credit card bills can be done using this option. The credit card number and the amount to be paid to the card is entered the amount will be transferred from this account.

## DEPOSIT.

Deposit of cash can be accepted. When the customer enters the amount the envelope will be provided and in that the customer can put the amount and insert in to the machine. The amount deposited will be credited in the customers account.

## FAST CASH.

Withdrawal of cash can be done in a fast way using Fast cash option. Fast cash will allow the user to withdraw either Rs.2000 or Rs.1500 or Rs.1000 or Rs.500. The check for the availability of cash is done before the cash is issued to the customer.

## CASH WITHDRAWAL.

Cash withdrawal can be done by manually entering the amount to be withdrawn. Withdrawal of the cash can be done by specifying the amount to be withdrawn. This amount will be debited from the account. The check for the availability of cash is done before the cash is issued to the customer.

## SPECIAL SERVICE OPTIONS

Using this screen the user can enter his choice of special service options. The special service provides options for paying various institutions, examination fees for various institutions.

## INSTITUTION SELECTION OPTION

Using this screen the user can enter his choice of institution. The institution choice of Maples ESM Technology, Anna University, and IIT Chennai is provided to the user.

# TECHNOLOGIES MODULES USED FOR DEVELOPING THE PROJECT

CICS ➡ FRONT END DESIGNING TOOL

DB2 ➡ DATABASE

COBOL ➡ PROGRAMMING LANGUAGE

## PROCESS OF IMPLEMENTING THE SOFTWARE MODULES

| CICS | (FRONT END DESIGN) |
|------|--------------------|

| COBOL | JCL-TO RUN COBOL CODINGS |
|-------|--------------------------|

| DB2 | DATABASE STORAGE |
|------|------------------|
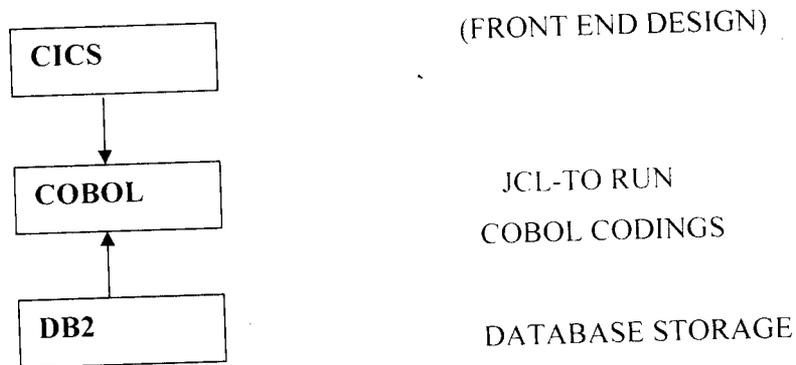
## 1.2 ORGANISATION PROFILE

Maples ESM technologies Ltd. Founded in May 2002 is managed by professionals and technocrats with 130+ person of experience in IT. From the current staff strength of 125 consulting professionals. At Maples constantly strive towards enhancing human endeavor by leveraging information. knowledge and technology.

Maples have a highly experienced leadership team that is passionately dedicated to achieving customer delight in IT Services and solutions .Our team has the right blend of Experience and Expertise in delivering business-critical solutions providing competitive business advantage and enhanced profitability to our clients and customers.

The strength of our management team lies in our repository of diverse experience and expertise. The combined with Maples strong industry partners consistently enable us to bring to our clients a highly experienced and qualified team.

Maples ESM Technologies Ltd. Is a consulting company focused on Enterprise System Management. Our consulting practice includes Enterprise Systems Management (ESM) Maples: a closely held public limited organization is promoted by technocrats.

Maples objective is to offer cost-effective, value-added services to our clients and customers. We offer integrated ESM solutions Implementing industry's best Practices while matching company's requirements.

We have installed the world's most advanced ESM competency center in India for O/S Databases, Networks and Application Management to provide ESM and EAI solutions from mid-size to large organizations.

# 2 SYSTEM DEVELOPMENT

## 2.1 SYSTEM ANALYSIS

System analysis is the process of gathering and interpreting facts, diagnosing the problems and using the information to recommend improvements on the system. The objectives of the study phase are the establishment of the requirements of the system to be acquired and installed. System analysis or study is a problem solving activity that requires intensive communication between the system users and system developers. The system is studied to the minutest detail and analyzed. . A structured approach has been used in the study phase to identify the needs of the user.

System study includes both a preliminary and detailed stage. During preliminary analysis, the analyst takes quick look at what is required and its costs and benefits justify the perceived need. Detailed analysis include an in depth look at what is needed and cost is more refined.

## 2.1.1 EXISTING SYSTEM ARCHITECTURE

The system used for the ATM machines in banking system is done with Visual basic/Access/Oracle concepts. The main drawback is the absence of an efficient storage system with high accessing speeds. With the help of a rigid architecture, one application can be processed or viewed by many users at a time.

As the Operating system used here is windows based, thus the system has a high probability of virus attack and has more down time. Only one job can be done at a time. Concurrent transactions can lead to system crash due to lack of resources.

The database used here is Access/Oracle which is flexible for all users having the disadvantage of allowing liabilities to all.

## DRAWBACKS OF THE EXISTING SYSTEM

- Lower access rates
- Not capable of storing large amount of data
- Concurrent access and execution not possible

- Limited number of users

## 2.1.2 PROPOSED SYSTEM ARCHITECTURE

The proposed system gives a banking organization with many solutions. With a backbone of architecture such as Mainframe the problem of data storage and security are solved. As for the past forty years Mainframe have always been known for there explicit capability of storage and data recovery, a bank's major wealth its data can rest assured to be safe.

With respect to speed and data transfer, a Mainframe has a High processing speed (100 to 750 MIPS – Million Instructions Per Second).It also has the capability of executing multiple applications simultaneously.

Mainframe supports more than hundred users to access and execute applications simultaneously, this range can exceed to a number as mush as seven fifty users for high End machines.

Other than the architecture, COBOL is used for programming the system with DB2 as backend to store data into the clusters. The user Interface and the transaction processing are performed by the Customer Interaction Control system (CICS).

# 3 DEVELOPMENT ENVIRONMENT

## 3.1 HARDWARE ENVIRONMENT

### Server Requirements

| | |
|---|---|
| **Operating system** | : OS/390 |
| **Server** | : Mainframe Sun blade server |
| **System developed on** | : Pentium PC |
| **Memory** | : 1.6 TB |
| **Hard disk capacity** | : 180 GB |
| **Monitor** | : IBM monitor |
| **Mouse** | : Logitech |
| **Keyboard** | : Intex |
| **Network** | : 36 Cisco routers and switches with enterprise |
| **Security** | : RACF |

### Client System Requirements

| | |
|---|---|
| **Operating system** | : Windows 98/2000/XP Linux |
| **System developed on** | : Pentium PC |
| **Memory** | : 256 MB |
| **Hard disk capacity** | : 180 GB |
| **Monitor** | : LG, IBM monitor |
| **Mouse** | : Logitech |
| **Keyboard** | : Intex/Logitech |
| **Security** | : RACF |

### Printer Requirements

**Printer** : AOM-TRP700 REMITTANCE PROCESSOR
**PAPER ROLL**

- 50 ROLLS
- 3-7/8 IN 98MM
- AOM MANUFACTURER
- PART NO 7059

## 3.2 SOFTWARE ENVIRONMENT

### Software Specification

| | |
|---|---|
| **Job control** | **: JCL** |
| **Time sharing** | **: TSO/ISPF** |
| **Access method** | **: VSAM** |
| **Database** | **: DB2** |
| **Datacom** | **: CICS** |
| **Host language** | **: COBOL** |

## 3.3 SOFTWARE DESCRIPTION

### INTRODUCTION TO MAINFRAME

- IBM's high end server OS.
- The storage capacity of mainframe server is very high (virtual storage).
- Multiple
- Applications can be done simultaneously.
- Large number of users can login at a particular time (more than 750).
- Up to 25 CPU's can be connected to a single mainframe server.

### RELIABILITY

- There is no loss of data. Hence highly reliable.
- Meant for non-stop operation (I.e., 24*7,248 days).
- Modules can be easily expandable (without shutting down the system)
- Good connectivity with non-IBM system like UNIX, LINUX etc.

- Memory management is highly efficient. (i.e., databases are stored in virtual storage. It is nothing but the DASD (main memory) doesn't have all the data's which is stored. Its uses secondary storage space. This increases the efficiency of memory).

- These advantages of MAINFRAME SERVER are used and implemented in designing the ATM TRANSACTIONS MANAGEMENT SYSTEM.

## HIGHLIGHTS

- Provides high security, scalability and high performance.
- Exploits latest open software technologies.
- it introduces main options like TSO (TIME SHARING OPTION) and ISPF (INTERFACTIVE SYSTEM PRODUCTIVITY FACILITY)

## TSO (TIME SHARING OPTION)

- Develop and maintain programs in language such as COBOL, PL/1, etc.
- Create an office environment.
- Process data.
- Communicate with other TSO users.
- Access the MVS operating system.

## ISPF (INTERFACTIVE SYSTEM PRODUCTIVITY FACILITY)

- Provides user friendly menus to interactive process our tasks.
- It runs on TSO.
- ISPF/PDF is a dialog application that provides application development facility
- It also provides interface to many system facilities through easy-to-use menus relieving us to know about the specific command syntax of the interactive system we are using.

## IBM terminologies

In IBM MAINFRAME environment there are some important terminologies with which the programs are being handled and are executed. These terminologies are very important because while working MAINFRAME SERVER, they use these terminologies and carry on their operations.

## SOME IMPROTANT IBM TERMINOLOGIES

IPL    ➤ Initial Program Load – To boot system (load OS).

Sub-system    ➤ A functional unit, such as database manager or
User Interface, which can run directly under the OS.

Panel / Map    ➤ A physical screen of data.

Data    ➤ A collection of data (files).

Job    ➤ A background process, which consists one or more
Program in a particular sequence.

Catalog    ➤ Data sets where details about dataset are stored.

VSAM    ➤ Virtual storage access method.

ABEN    ➤ Abnormal termination (or) of the task / program /job.

The project is been developed in **Mainframe Environment** and the **Software** used in this technology is **COBOL**. The front and design is done using **Customer Information Control system (CICS)**. The data storage (i.e.,) the database is maintained using **DB2**.

The **Hardware** part of this is a unique environment where all the models like **(JCL, DB2, COBOL AND CICS)** are not internally connected. This makes the system

robust. This also makes the **Mainframe Server** have a less possibility of getting problem in the internal (I.e., Software) modules.

The security system in this **Mainframe** Server is

- **RACF** - Resource Access Control Facility.

**About Z/OS (SERVER)**

- 4 bit address mode-4GB of Virtual storage.
- Registers in CPU are 64 bit.
- Program status word (PSW) in CPU is 128 bit.
- It is tri model (i.e.,) can execute 24 bit, 32 bit and 64 bit instructions.
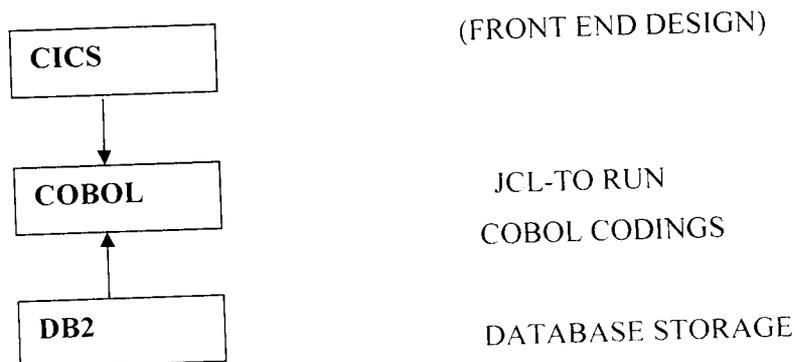- Supports all soft wares like ORACLE,UNIX,LINUX J2EE, .NET etc,

**Modules Used For developing the project**

CICS ➡ FRONT END DESIGNING TOOL

DB2 ➡ DATABASE

COBOL ➡ PROGRAMMING LANGUAGE

**PROCESS OF IMPLEMENTING THE SOFTWARE MODULES**

| CICS | (FRONT END DESIGN) |

↓

| COBOL | JCL-TO RUN COBOL CODINGS |

↑

| DB2 | DATABASE STORAGE |

# Introduction to Online Processing

- Data is entered individually in any order.
- Transactions are initiated from the terminal.
- Information is always current.
- Output is displayed at the terminals.
- Turnaround time is measured in seconds.

## Example: Automated Teller Machine (ATM)

The various modules which are used in this Mainframe server are:

- JOB CONTROL LANGUAGE (JCL)
- JOB ENTRY SUB-SYSTEM(JES)
- VIRTUAL STORAGE ACCESS METHOD (VSAM)
- CUSTOMER INFROMATION CONTROL SYSTEM (CICS )
- COMMON BUSINESS ORIENTED LANGUAGE (COBOL)
- DB2

**About JCL:**

Job Control Language or JCL is a set of statements that provide the specifications necessary to process a job. Communication with the operating system is done by typing commands or job Control Language Statements. The O.S coordinates and manages the resources; the command language provides guidance and directions.

Job stream is a series of commands prepared and submitted before the first program is loaded. We do not use JCL to write computer programs. Instead, it consists of control statements that introduce a computer job to the operating system provide accounting information, direct the operating system on what is to be done, request hardware devices, and execute the jobs (I/O) requirements. We code the JECL (Job Entry Control Language) to specify on which network computed to run the job, when to run the job, where to send the resulting output. IBM provides two Job Entry Systems for z/OS: JES2 for decentralized control, and JES3 for highly centralized control or several computers

**Purpose of Using JCL**

- Job Control Language Functions:

- Identify users – essential for security.
- Identify programs.
- Specify device requirements.
- Run-time intervention.

## Concept of Job and JOB steps

A JOB is an execution of one more related program in sequence. Each program to be executed by a job is a JOB STEP. A job begins with the execution of the first job step and continues until the last program has finished executing, unless an error occurs.

## About VSAM

VSAM is a high-performance access method used in OS/VS and ZOS operating systems. VSAM software resides in virtual storage along with the program that needs its services for the manipulation of the data on direct access storage device (DASD). VSAM acts as interface between operating system and application program.

## Concepts:

In almost every type of programming activity on an IBM mainframe, one is bound to come across files supported by VSAM, the virtual Storage Access Method. VSAM is by far the most commonly used access method on MVS systems.

VSAM does more than just replace non-VSAM access methods with VSAM access methods; it also provides efficiency improvements and compressive catalog facility that centralizes information about all VSAM datasets. In Addition, the multifunctional utility program-AMS-has a variety of file related functions for VSAM as well as non-VSAM files.

## Some of the major disadvantages of VSAM

- To take advantage of the partial self –reorganization capabilities of VSAM datasets, free space must deliberately be left. For datasets that are used for read-only purposes, no free space is required.
- Except for read-only datasets, the integrity of VSAM datasets in cross-system and cross-region share must be controlled by the user. Data integrity must be a

prime consideration in the initial design of the application that will be shared across systems.

VSAM provides four types of file organization along with their respective access methods and utilities.

- Entry-Sequenced Data set-ESDS – is like a standard sequential (QSAM) dataset.
- Relative-Record Dataset-RRDS – is like a direct file. (BDAM).
- Key-Sequenced Dataset-KSDS – is like indexed sequential access method file.
- Linear Dataset – LDS – with no record organization.

## About COBOL

Data processing in the business environment calls for relatively simple and repetitive computations and handling very large volumes of data. There was no language that was available which could be used for Business and commercial application. Hence computer manufacturers and users decided to develop a language to cater to the needs of the business community. The result was the development of COBOL (Common Business Oriented Language). COBOL is the most wide- spread commercial application language in use today.

COBOL was conceived at pentagon meeting, CODASYL the Conference on Data System Language in 1960 when the first COBOL compilers became available. Later the American National Standard Institute (ANSI), and organization that develops standards in numerous fields, developed an ANSI COBOL version in 1968 which specified the standards to be followed by all computer manufacturers and software suppliers.

COBOL is communal available and business oriented. One main reason for its popularity is that COBOL is English-like language and programs written in COBOL are easy to read and comprehend. COBOL is also called a self documenting language.

**The Nature of COBOL**

- English-like – in COBOL II instructions are English – like. For Example to add two numbers together we use the verb ADD. Similarly the rules for programming in COBOL confirm to rules for writing in English, making it relatively simple language to learn, understand and use.

- Structured-COBOL has got a high degree of support for writing structured code. COBOL was developed at a time when the concepts of structured programming where not that well established.

- Self Documenting - One of the advantages of COBOL is that it can be substantially self-documenting. Self-documentation is defined as the characteristic of a language that allows the reader of program.

## ABOUT CICS/VS CUSTOMER INFROMATION CONTROL SYSTEM/VIRTUAL STORAGE

CICS/VS – A Teleprocessing Monitor.

CICS/VS – TRANSLATOR: used to translate CICS syntax into COBOL code.

## BASIC MAPPING SUPPORT (BMS):

- Used to display field type.

- Code screen displays (Mapping).

- Bring data to and from the terminal using simple commands in the procedure Division.

## Field Types:

- Types-named fields and unnamed fields

- Named Fields – contains data for input and output.

- Application programs access these fields by name.

- Unnamed fields – Contains information which is for the screen only.

- Contents which make the screen easier to read.

## MAPS – TYPES

### Symbolic Map:

- It defines all named data fields for the terminal.
- These are available in the copy library as a member.

### Physical Map

- Describes the display format for the terminal.
- Length, position and attributes of named fields.
- Information about the terminal.
- Ex: Constants, Heading etc

# 4 SYSTEM DESIGN

## 4.1 FUNDAMENTAL DESIGN CONCEPTS

Design is the first step in the development phase for any engineered product or system. Design is a creative process; a good design is the key to effective system. The term "design" is defined as "the process of applying various techniques and principles for the purpose of defining a process or a system in sufficient detail to permit its physical realization". Software design sits at the technical kernel of the software engineering process and is applied regardless of the development paradigm that is used.

From a project management point of view, software design is conducted in two steps. Preliminary design is concerned with the transformation of requirements in to data and software architecture. Detail design focuses on refinement to the architectural representation that lead to detail algorithm data structure and representation of software.

Design starts with the system requirement specification and converts it to a physical reality during the development. Important design factors such as reliability, response time, throughput of the system, maintainability, expandability etc should be taken into account.

## 4.2 USE CASE DIAGRAM

The Use case diagram is used to identify the primary elements and processes that form the system. The primary elements are termed as "actors" and the processes are called "use cases." The Use case diagram shows which actors interact with each use case. Use case diagrams model the functionality of a system using actors and use cases. Use cases are services or functions provided by the system to its users.
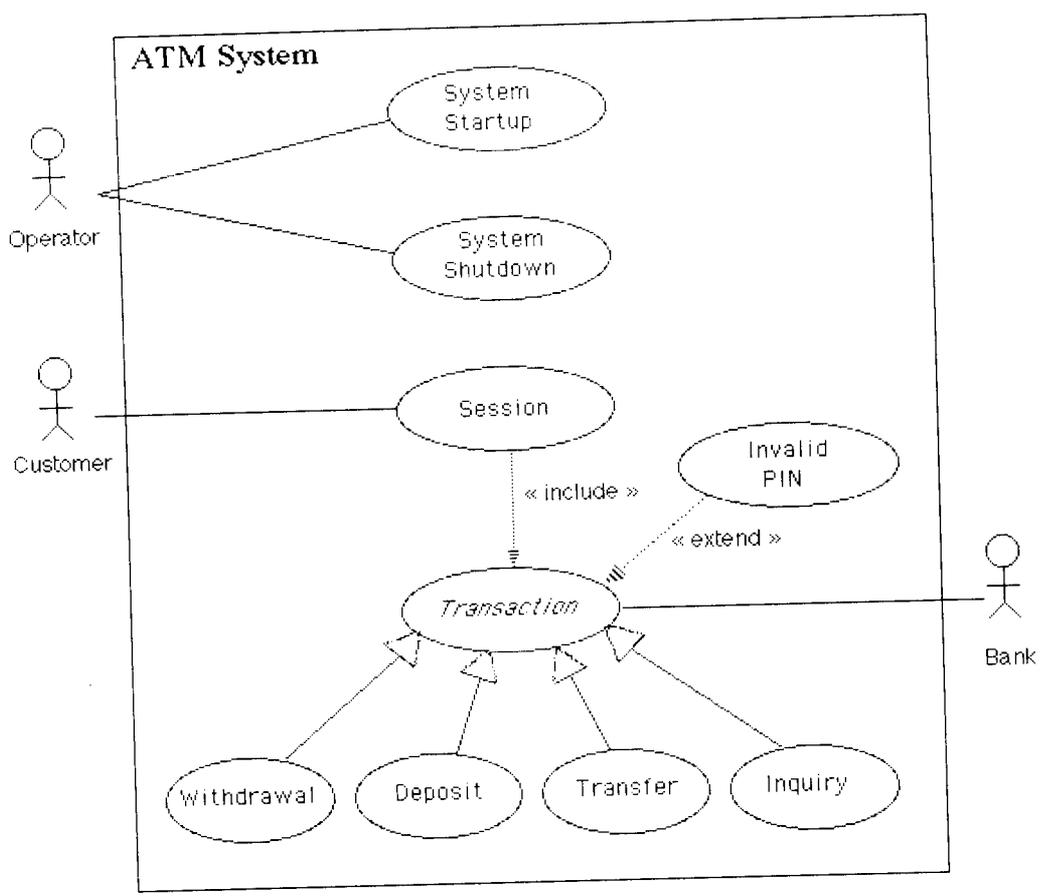
**Figure 4.2.1 Use Case Diagram**

Figure 4.2.1 shows the Use Case Diagram of ATM Transactions Management System. Also it shows the relationship among the actors involved in this system. Actors are customer, Operator, Bank Employee. The actors are connected to the use cases with lines.
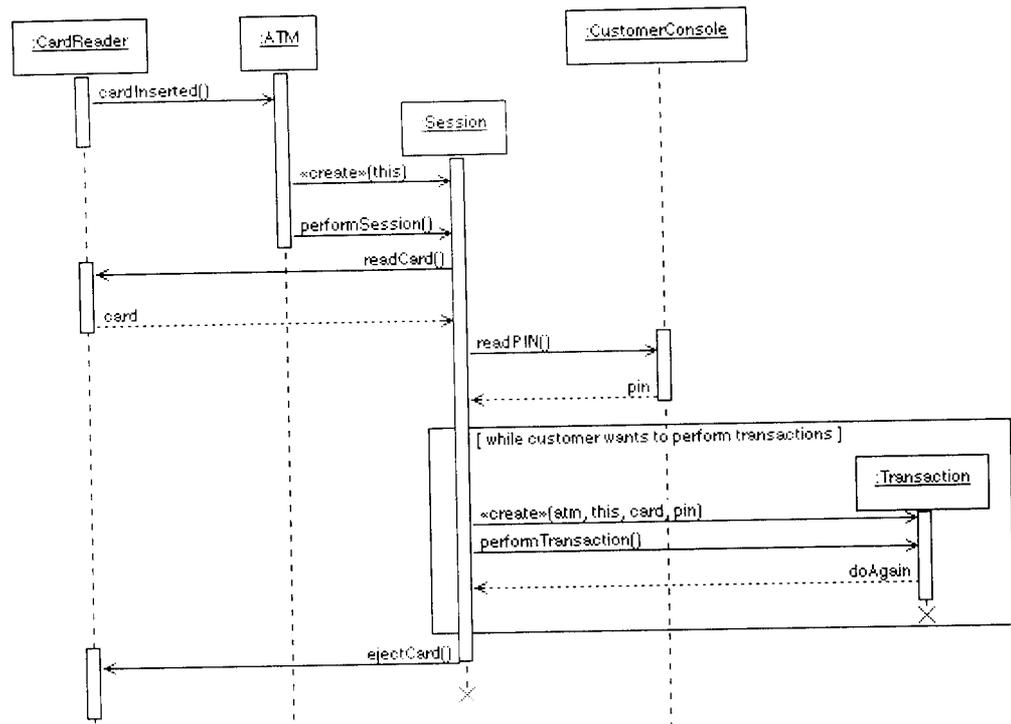
## Session Sequence Diagram



**Figure 4.2.2 Sequence Diagram for Validating Pin number**

Figure 4.2.2 shows Sequence Diagram the process involved in validating the card number and the pin number. Also it shows what are all the functions involved in this process and how messages are passed among the functions.
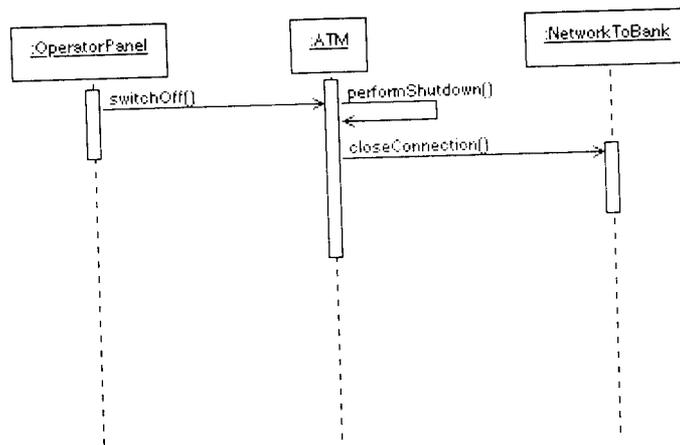
## System Shutdown Sequence Diagram



**Figure 4.2.3 Sequence Diagram for Shut Down**

Figure 4.2.3 shows Sequence Diagram for shut down process. The Operator switch off the system and the process is performed and the bank closes its connection.
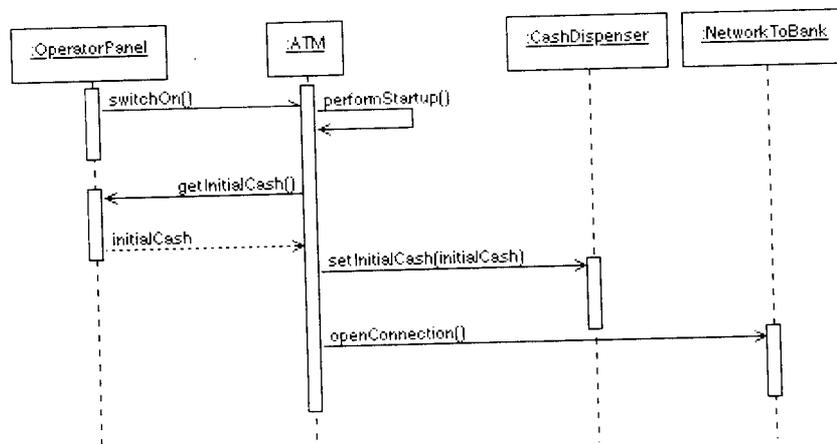
## System Startup Sequence Diagram



**Figure 4.2.4 Sequence Diagram for Switch on**

Figure 4.2.4 shows Sequence Diagram for switch on process. The Operator switch on the system and the process is performed and the bank opens its connection.

## 4.3 DATA FLOW DIAGRAM

Data Flow Diagrams are graphical representation depicting information regarding the flow of control and the transformation of data from input to output. The DFD may be used to represent the system or software at any level of abstraction. They are also known as bubble chart. It consists of a series of bubbles joined by lines. The bubbles represent data transformation and the lines represent data flow in the system. In fact, DFD can be partitioned into levels. A Level 0 DFD called Context Level Diagram represents the entire software system as a single bubble with its interactions. The Context diagram shows the overall system with the users who will be interacting with it.

The Table 4.3.1 lists the important elements of DFDs.

Symbol          Stands For

Data process
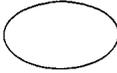
Data processing

Data flow

Data flow or the exchange of data between processes

Data store

Data storage

Entity
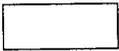
Real world Object
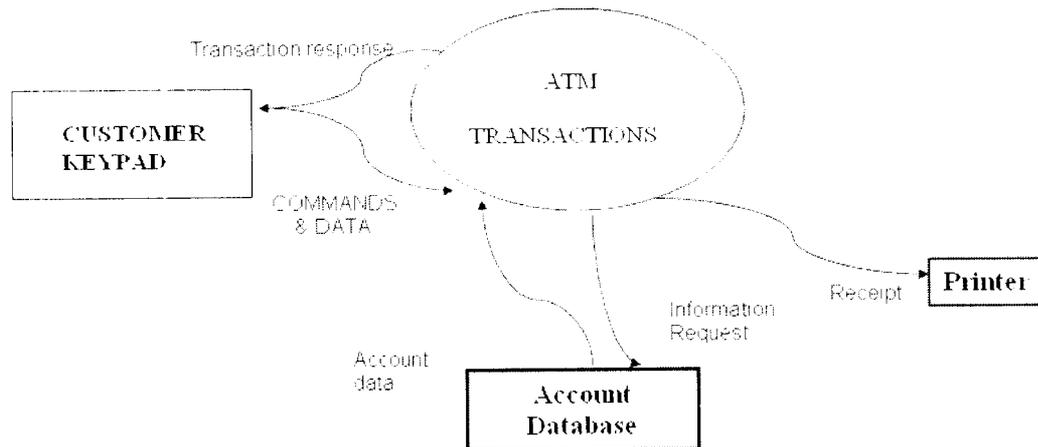
## 4.3.2 Level Zero DFD: Context Diagram



**Figure 4.3.2 Level 0 DFD for OVERALL SYSTEM**

This Figure 4.3.2 shows Level 0 DFD shows the high level process and their interrelation. The customer and network operator are the Two main User of this system and it show the how they are interact with the ATM Transactions Management System
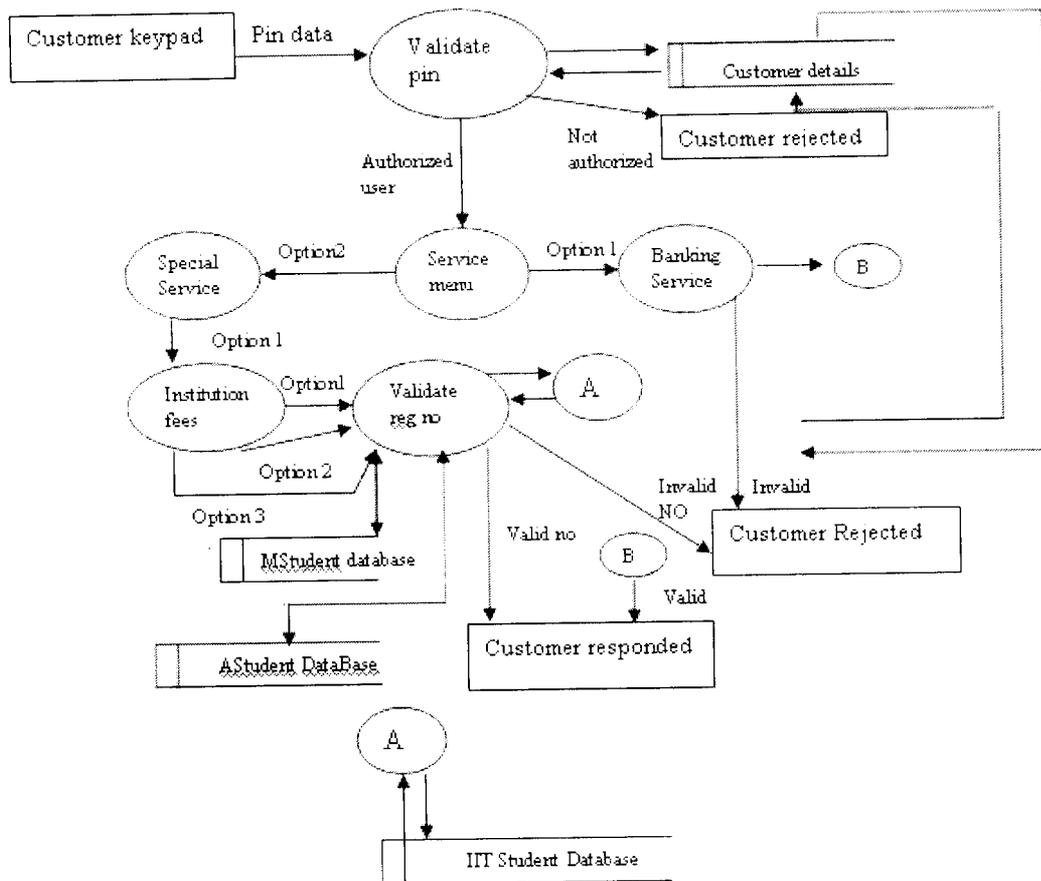
### 4.3.3 Level 1 DFD



**Figure 4.3.3 Level 1 DFD**

This Figure 4.3.3 shows Level 1 DFD shows the high level process and their interrelation.

### 4.3.4 Level 2 DFD



**Figure 4.3.4 Level 2 DFD**

This Figure 4.3.4 shows Level 2 DFD shows the high level process and their interrelation.
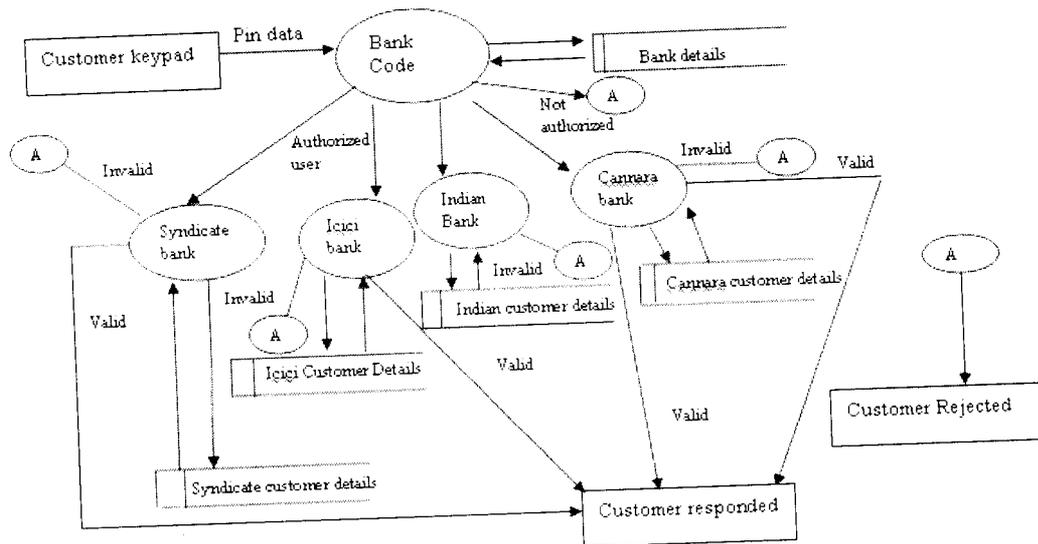
## 4.3.5   LEVEL 2 Pin validation DFD



**Figure 4.3.5 Level 2 Pin validation DFD**

This Figure 4.3.5 shows Pin Validation DFD shows the high level process and their interrelation.
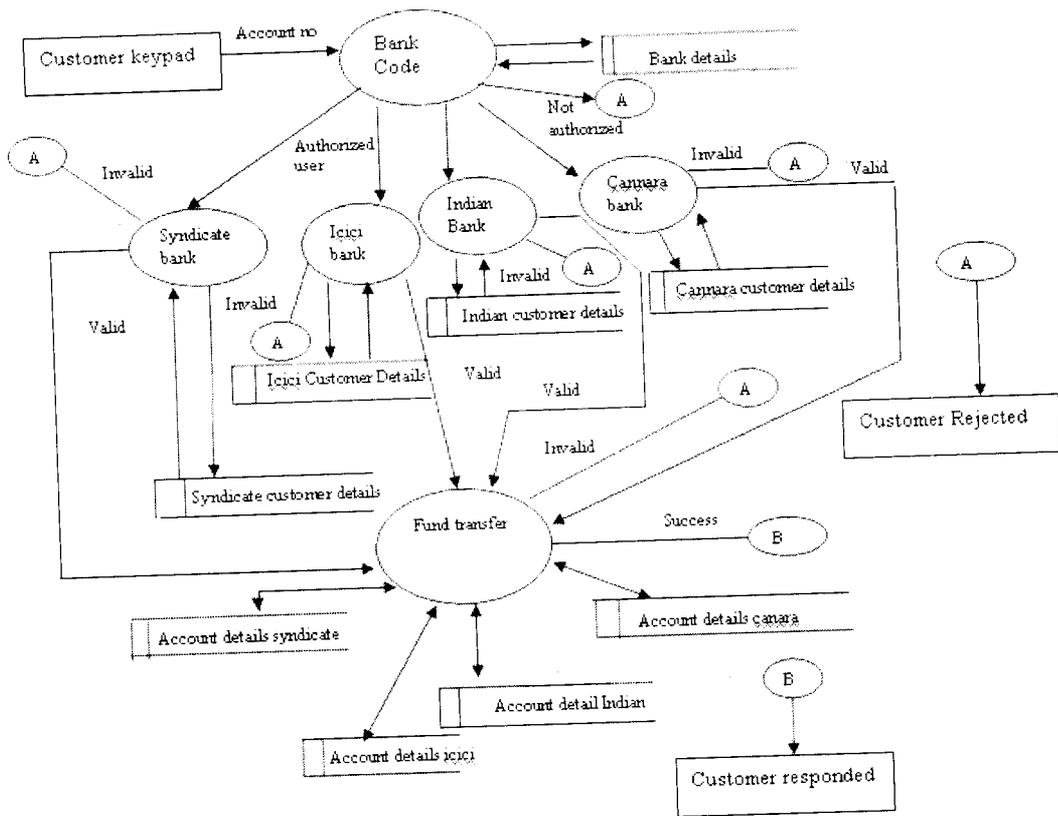
## 4.3.6 LEVEL 2 Fund Transfer DFD



**Figure 4.3.6 Level 2 Fund Transfer DFD**

This Figure 4.3.6 shows Fund Transfer DFD shows the high level process and their interrelation.

## 4.4 TABLE DESIGN

### Record Management System

A record store is an ordered collection of records. Records are not independent entities: each must belong to a record store, and all record access occurs through the record store. In fact, the record store guarantees that records are read and written atomically, with no possibility of data corruption.

### Speed

Operations on persistent memory normally take longer than the equivalent operations on volatile memory. Writing data, in particular, can take a long time on some platforms. For better performance, cache frequently accessed data in volatile memory to keep the user interface responsive

## LIST OF TABLES

| S.No | Table Name | Description |
|------|------------|-------------|
| 1 | CUSTOMER_MASTER | Stores the customer details |
| 2 | ACCOUNT_MASTER | Stores the current and saving accounts details |
| 3 | DAILY TRANSACTION | Stores the transactions of the customer |
| 4 | ACCOUNT_TYPE | Stores the Account Type of the customer |
| 5 | DEPOSIT_MASTER | Stores the details of the amount the customer have in his account |
| 7 | CHEQUE_BOOK | Stores the details of the cheque |

| 9 | INSTITUTION_DETAILS | Stores the details of the Institution |
| 10 | INSTITUTION_FEES | Stores the details of the Institution fees |
| 13 | CARD_DETAILS | Stores the details of the card |
| 14 | CONTROL_SYSTEMS | Stores the details of the machine |

**Table 4.4.1 Record Stores in ATM Transaction Management System**

Table 4.4.1 shows that Record Stores are involved in the ATM Transaction Management System. Also it describes each Record Store usages.

# 5    ARCHITECTURAL DETAILS

## 5.1 Mainframe Architecture

```
┌──────────────┐          (FRONT END DESIGN)
│   CICS       │
└──────┬───────┘
       │
       ▼
┌──────────────┐      ┌─────────┐      ┌──────────────────────────────┐
│   COBOL      │─────▶│   JES   │─────▶│   MAINFRAME SERVER           │
└──────┬───────┘      └─────────┘      │                              │
       ▲                               │                              │
       │                               └──────────────────────────────┘
┌──────────────┐                        DATABASE STORAGE
│   DB2        │
└──────────────┘
```
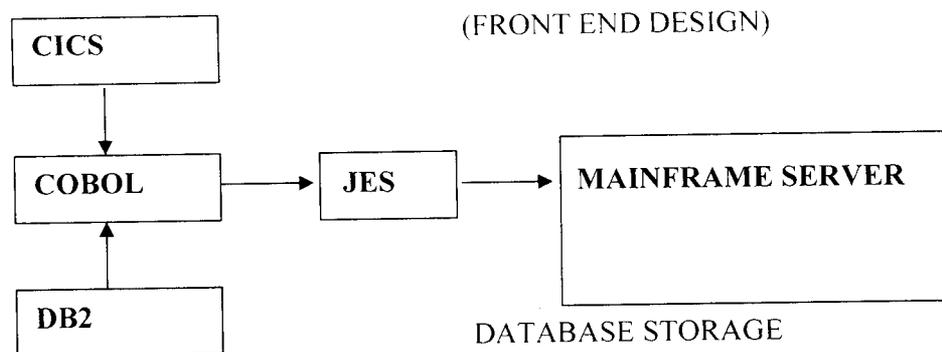
Figure 5.1.1 Mainframe Architecture

## 5.2 Module Description

In this ATM Transactions Management System have the following Modules: Card Number Verification Process, Pin number Verification Process, Language Selection. Account Option, Banking Service and Special Service, The banking services include Fund Transfer, Check Book request. Statement Request, Pin Change Request, The special service provides options for paying examination fees for various institutions.

## 5.3 CARD NUMBER VERIFICATION PROCESS.

### REQUIREMENTS

Before any transactions take place the customer must put the card in to ATM machine. If the number matches the number on the database, the customer is allowed to continue with their transaction. If the customer fails in the number, card will be rejected and a message is sent to the bank's main computer.

**DESCRIPTION**

When the user put the card the number is verified with the card number present in the database. Only when it is verified the process moves on to the next one. Otherwise error message will be displayed.

**PURPOSE**

The verification program helps to provide security. It helps to avoid any unauthorized access of the accounts and services. Thus to provide the proper and authorized access to the account the verification process is used.

## 5.4 PIN NUMBER VERIFICATION PROCESS.

**REQUIREMENTS**

The customer has to enter the pin number, this is verified against the database and only if the pin number entered is correct, the user can access his account from the ATM.

**DESCRIPTION**

When the pin number is entered, the pin number is checked against the password in the database. Only when it is verified the process moves on to the next one. Otherwise error message will be displayed.

**PURPOSE**

The verification program helps to provide security. It helps to avoid any unauthorized access of the accounts and services.

## 5.5 LANGUAGE SELECTION

**REQUIREMENTS**

The user can select any language he wants the ATM machine to use. There is a choice between English, Tamil, and Hindi. The particular selection will lead the customer to the required screen.

## DESCRIPTION

When the user enters this screen the customer will be shown three options for choosing the language. He can choose from any one of those that is any of the three languages-English, Tamil, or Hindi.

## PURPOSE

The availability of language options will help the user to interact with the machine in the language he prefers. This makes the ATM system more user-friendly.

## 5.6 ACCOUNT OPTION.

## REQUIREMENTS

The user can enter any option he wants to use, either the current account or the savings account. The current account can be entered by users having current account. The savings account can be entered by users having savings

## DESCRIPTION

The user can select between the Savings Account and the current Account

## PURPOSE

The user can do transaction with either the current account or the savings account and make use of its services. The savings account will make changes in the savings account of the user and the current account will make change in the current account the user. One user may have either current account or savings account or both. So depending on the choice of the user to access the account, the user enters his option.

## 5.7 SERVICES OPTION.

## REQUIREMENTS

The user can enter any option he wants to use, he can choose between the banking services offered and the special services. The banking services offers services like Funds Transfer, cheque book Request, statement request, Pin change Request and the special service is the payment of examination fees.

## DESCRIPTION

The user can select between the banking services, which caters to the need of all the banking related issues. Other services include the special services that ate provided by the bank.

## PURPOSE

The purpose of having banking services is to provide good banking facilities for the user to use easily. The special services offer extra services,. Thus these are the main options required which effectively takes care of all the services required by the user.

## 5.8 BANKING SERVICES OPTIONS

### REQUIREMENTS

In this module the user can select the any of the banking services options provided.

### DESCRIPTION

The banking services include Fund Transfer, Check Book request, Statement Request. Pin Change Request.

## 5.9 FUND TRANSFER.

### REQUIREMENTS

The fund can be transferred from on account to other. The customer has to enter the account number and the amount to be transferred. The funds from the customers account will be transferred to the account.

### DESCRIPTION

When the customer enters the account number to which the funds are to be transferred, the availability of funds in the account is checked. When the money requested for transfer is available, this amount will be debited from this account and will be credited to another or same account depending on the account number.

**PURPOSE**

When a user wants to transfer funds from one account to another this fund transfer facility is very much helpful. For example, when a user wants to transfer funds from his savings account to the current account, he can do this by using this facility. The funds from his savings bank are immediately debited in his current account.

## 5.10 CHEQUE BOOK REQUEST.

**REQUIREMENTS**

The cheque book can be requested directly through the ATM machine. The number of leaves can be specified and the request can be made and is collected from the bank.

**DESCRIPTION**

When the user wants to obtain cheque book, then he can directly request for issuance of Cheque book through the ATM. The user is required to enter the number of leaves of Cheque required by him. Once this information is given, the user is immediately notified that the Cheque book request has been sent to the bank and he can collect it from the bank.

**PURPOSE**

In the actual process of requesting for the chequebook, the user has to fill out a form in bank. This form should be submitted to the bank. This tedious process is very much simplified and the customer can easily place the request at his own convenient timings.

## 5.11 STATEMENT REQUEST.

**REQUIREMENTS**

The statement can be viewed and printed out using the ATM machine. The statements indicating the transactions can be obtained anytime for a fixed period of time.

## DESCRIPTION

When the user wants to get details of the transactions that has taken place till date, he can use this option and obtain the transaction details. This will give the information of the transactions that has taken place starting from a fixed period.

## PURPOSE

The customer can constantly keep track of the transactions that have taken place. During emergency also we can get the details of the previous transactions. This enables the users to know how much amount has been involved in the transaction and the date and time of transaction.

## 5.12.PIN CHANGE REQUEST.

### REQUIREMENTS

The pin can be changed by the customer when he wants to. First he will be prompted for the new pin and he has to reenter it again for confirmation purposes.

### DESCRIPTION

When the user wants to change his pin, he enters into the pin change menu. In this screen he will be prompted about the new pin. To confirm the pin entered, the user has to reenter the new pin. These entered pin numbers will be validated. If both the pins entered are same, he will be given a message indicating the successful pin change.

### PURPOSE

For the security purposes, the user has to change the pin numbers periodically. This will help the user to have secured transactions.

## 5.13 TRANSACTION OPTIONS.

### REQUIREMENTS

In this module the user can select the any of the transaction options provided.

## DESCRIPTION

The transaction process comprises all the banking services like Balance enquiry, payments, Mini statements, Deposit, Fast Cash, and Withdrawal. The transaction processes will each have its own Transaction ID. As soon as a new transaction takes place the Transaction ID will get incremented.

## 5.14 BALANCE ENQUIRY.

### REQUIREMENTS

Balance enquiry can be obtained through this option. The user can request to view the balance amount in his account at any time.

### DESCRIPTION

Once this option is chose, the balance present in the account will either be printed out as a receipt or shows to the user in the terminal.

### PURPOSE

The balance enquiry option is very useful, as the user will know the maximum amount he can withdraw. This helps him decide on the transactions he is going to make.

## 5.15 CREDIT CARD BILL PAYMENT.

### REQUIREMENTS

Payment of credit card bills can be done using this option. The number and the amount to be paid will be entered by the customer.

### DESCRIPTION

The credit card bill can be paid using the facility. The payment made can be made easily since the amount will be directly transferred from the account of the customer.

### PURPOSE

The payment of credit card bills is very much simplified. The amount to be paid can be directly transferred from the account of the customer to the bank. The customer need not provide any cheques for the amount or need not pay in person for the bill.

## 5.16 MINI STATEMENTS.

### REQUIREMENTS

The transaction details of last seven transactions can be obtained.

### DESCRIPTION

When the user enters this option, the last seven transaction details will be either printed out or showed on screen. This will include all kinds of transactions like withdrawal, deposit or fund transfer.

### PURPOSE

The mini statement informs the user of the past seven transactions that he has done. This helps him in knowing about the transactions he has made and also he can know about the available balance in his account.

## 5.17 DEPOSIT.

### REQUIREMENTS

Deposit of cash can be accepted. The amount deposited will be credited in the customer'saccount.

### DESCRIPTION

When the customer wants to deposit cash, the amount to be deposited will be entered by the customer. This amount will be credited in his account.

### PURPOSE

The customer can deposit the cash in the ATM itself. There is no requirement for him to go to bank to deposit cash. This facility simplifies the banking process for the customer.

## 5.18 FAST CASH.

### REQUIREMENTS

Withdrawal of cash can be done in the fastest way using Ultra fast cash.

**DESCRIPTION**

Ultra fast cash will provide easy withdrawal of cash. The check for the availability of cash is done before the cash is issued to the customer.

**PURPOSE**

Instead of entering the amount to be withdrawn, the user can directly choose from the options provided, to obtain the cash.

## 5.19 CASH WITHDRAWAL.

**REQUIREMENTS**

Cash withdrawal can be done by entering the amount to be withdrawn.

**DESCRIPTION**

Withdrawal of the cash can be done by specifying the amount to be withdrawn. This amount will be debited from the account. The check for the availability of cash is done before the cash is issued to the customer.

**PURPOSE**

The customer can obtain the required amount by entering the amount directly. He can specify his requirement and obtain the amount.

## 5.20 SPECIAL SERVICE OPTIONS

**REQUIREMENTS**

Using this screen the user can enter his choice of special service options.

**DESCRIPTION**

The special service provides options for paying various institutions, examination fees for various institutions.

## 5.21 INSTITUTION SELECTION OPTION

**REQUIREMENTS**

Using this screen the user can enter his choice of institution.

**DESCRIPTION**

The institution choice of Maples ESM Technology, Anna University, and IIT Chennai is provided to the user.

## 5.22 PAYMENT OF INSTITUTION FEES.

**REQUIREMENTS**

Using this examination fee can be paid from the ATM itself.

**DESCRIPTION**

This option provides the customer the flexibility of paying their various examination fees using the ATM. Here the user gives his roll number, amount to be paid. The amount entered is debited from the customer account.

**PURPOSE**

It simplifies the process of payment of examination fees. The student need not spend time in going to the center and pay the fees and this also ensures immediate payment of the fees.

# 6 SYSTEM IMPLEMENTATION

In the implementation phases, the project reached its function. After the development phase of the SDLC is completed. the system implemented. The software, which designed in design and programmed in development phases of the SDLC, was uploaded to the server. Moreover. both the hardware and software tested. Although I found and fixed many problems, almost invariably, this helped me to uncover problems that I was unable to simulate. These were some of the activities performed by me in the due course of the project, which led to its proper completion.

## Post Implementation Review

The Post Implementation Review is sometimes called System Audit. The review is intended to accomplish two goals.

- Evaluate the operation system that user developed.
- Evaluate the system development procedures to determine how the project could have been improved.

According to the review made the program runs satisfactorily and was also found to be better in working when compared with the old system. The information provided in new system is much improved in all manners.

## System Maintenance Issue

The Maintenance stage focuses on change that is associated with data security, error correction, and adoption required as the software's environment evolves and enhancement brought about by changing customer requirement evolves and enhancement brought about by changing customer requirements.

## Corrective Maintenance

In our project, no one can use the card than nominee. Security is maintained. The PIN is mentioned and the signature of the nominee in the card should match the

signature in the database. The server need not be shutdown if we want to make any updating then we can make use any one of the client side program temporarily.

## Adaptive Maintenance

An activity that modifies the software to properly interface with a changing environment. The system has been modified so that various changes include to the new system. This software is checked with the different environment like Windows XP, LINUX. This software was originally developed in Windows XP Environment and it was implemented in LUNIX the performance of the Software is checked.

# 7 TESTING

## 7.1 VERIFICATION AND VALIDATION

### SYSTEM VERIFICATION

System verification answers the question "Am I building the product right?" It includes the review of interim work steps and interim deliverables during a project to ensure they are acceptable. Verification also determines if the system is consistent, adheres to standards, uses reliable techniques and prudent practices, and performs the selected functions in the correct manner. In data access, it verifies whether the right data is being accessed, in terms of the right place and in the right way.

For example, the customer names gather from database, so that the name should be verified whether they are bound to the correct database field. It is done during development of the key artifacts. Verification is a demonstration of consistency, completeness, and correctness of the software at each stage and between each stage of the development life cycle. In result analysis, verification is done during the development itself. Each database bindings are verified after binding to test whether the control is bound to the right data field.

### SYSTEM VALIDATION

Validation answers the question "Am I building the right product?" This checks whether the developer is moving towards the right product, whether the development is moving the actual intended product that was agreed upon in the beginning. Validation also determines if the system compiles with the requirements and performs functions for which it is intended and meets the organization's goal and user needs. It is traditional and is performed at the end of the project. In data access, it checks whether we are accessing the right data, in terms of data required to satisfy the requirement.

Validation is performed after a work product is produced against established criteria ensuring that the product integrates correctly into the environment. It determines the correctness of the final software product by a development project with respect to the user needs and requirements.

Functional validation is done in the ATM Transactions Management System to check whether each of the functions is done correctly as expected in every module.

The system is validated following cases:

- Check the authentication of users to prevent illegal access
- Number of validation
- Character validation
- Validations to check the special characters
- Validations to check the proper number entry of the text in the input field
- Validations to check for proper display of error messages when the input fields are kept empty.

## 7.2 UNIT TESTING

Unit testing is used to perform the verification of the smallest units of software design such as individual forms of the module. All the validations and conditions are tested in the module level. Control parts are tested to ensure the information properly flows in and out of the program. In our system, the modules of the system are tested separately. Unit testing has been successfully handled. The data was given to each module in all respects and have been found working properly.

| S. No | Test Phase | Input | Expected Output | Actual Output |
|---|---|---|---|---|
| 1 | Test the Login module and check customer number and password | Invalid password | Error message returned from login validation Procedure | Return Message as the status of the operation |
| 2 | Cash withdrawal | Blank spaces at the Number field of the Text Entry | Validate procedure capture Blank space in Text Field alerting "No blank Spaces allowed in the Amount field" | Alert Message displayed |
| 3 | Excess Amount withdrawal | Input excess amount | Validate Amount procedure which captures Invalid number " Enter valid amount only" | Error Message displayed |

**Table 7.2.1 Unit Testing Test Case**

## 7.3 INTEGRATION TESTING

Integration testing tests the process of integrating the various modules to form the completed system. Integration starts with a set of units each individually tested in isolation and ends when the entire application has been built. Integration testing verifies that the combined units function together correctly. It facilitates in finding problem that occur at interface or communication between the individual parts.

| S. No | Test Phase | Input | Expected Output | Actual Output |
|---|---|---|---|---|
| 1 | Cash withdrawal | Input amount after four transactions have been done | "No Excess transaction today" information to be return | Error message shows the returned value. |

Table 7.3.1 Integration Testing Test Case

## 7.4 BLACK BOX TESTING

The black box approach is a testing method in which test data are derived from the specified functional requirements without regard to the final program structure. Because only the functionality of the software is concerned, this is mainly referred as functional testing a testing method emphasized on executing the functions and examination of their input and output data. In BLACK BOX testing, only the functionality is determined by observing the outputs to the corresponding inputs. In this testing, various inputs are exercised and the outputs are compared against specification to validate the correctness.

## 7.5 WHITE BOX TESTING

The white box testing, software is viewed as a structure and the flow of software under test is visible to the tester. WHITE BOX testing is also called as glass box testing, logical driven testing or design driven testing. In white box testing, testing plans are made according to the details of the software implementation, such as programming language, logic and styles. Test cases are derived from the program structure and each and every line of code is tested to ensure the correct syntax. All the control statements are tested verify the logical flow.

# 8 SYSTEM MAINTENANCE

In software engineering, software maintenance is the modification of a software product after delivery to correct faults, to improve performance or other attributes, or to adapt the product to a modified environment."

## USER TRAINING AND DOCUMENTATION

The implementation of the system includes the training of the system. Training of the system operators includes not only the instruction on how to use the system, but also how to diagnose system errors and mal-functions and ways to resolve the same. So proper training should be provided to system operators. No training is complete without familiarizing users with simple system maintenance activities.

# 9 FUTURE ENHANCEMENTS

Nothing can exist as such till the end of the world. Changes may occur to all kinds of systems. Likewise this system is also subjected to changes to meet the ever changing tastes and requirements of the customer. At present in this ATM Transactions Management System give the basic solution for the Chaitanya Bank especially the Experience comes only when we face the real problem, so based on real-time problem we can enhance our application also to give the proper solution to the problem with the help of other new technology.

# 10 CONCLUSION

Thus the ATM Transactions Management system project is being developed under REAL TIME ENVIRONMENT. This project now works with the help of some simple tables which is used to update the transactions that are made through this ATM process. The main aim of developing this project in MAINFRAME ENVIRONMENT is to overcome the demerits of the currently working system. While developing this project some criteria's are always kept as an important factor.

Some of them are

- ✓ Make sure maintenance is less.
- ✓ Using the memory in an efficient manner.
- ✓ Efficiently utilizing the server.
- ✓ Having high security features.

Less corruption of software modules involved in the function.

# APPENDIX 1

## SCREEN SHOTS
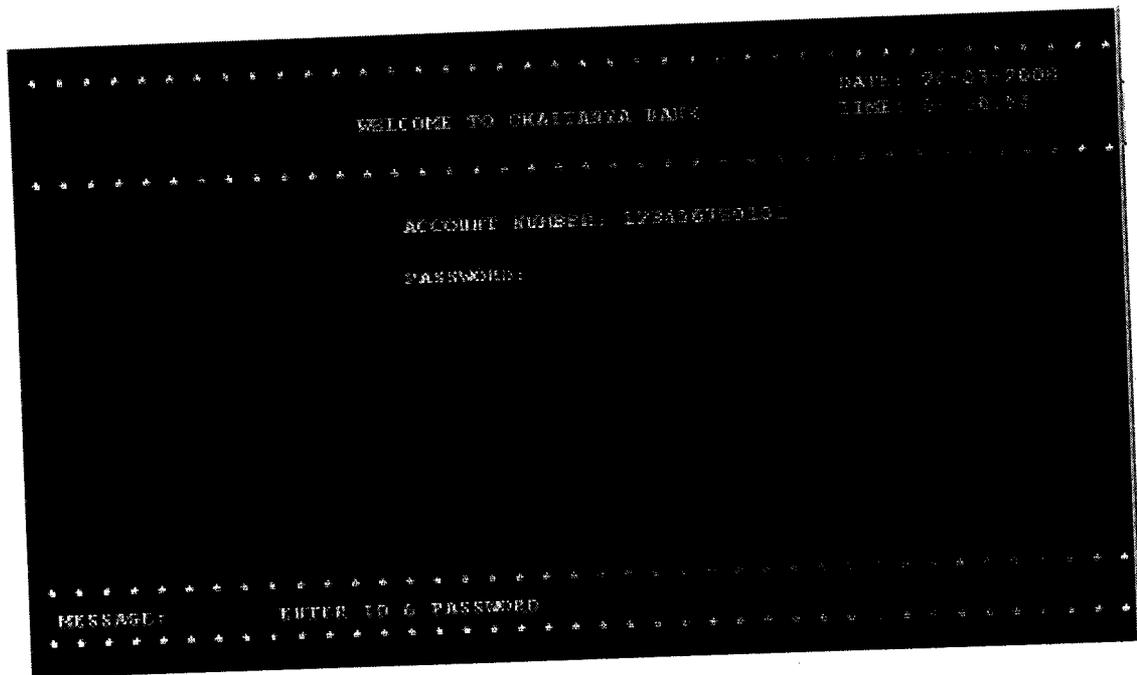


**Figure A 1.1 Login Screen**

**Figure A 1.2 Account Selection**
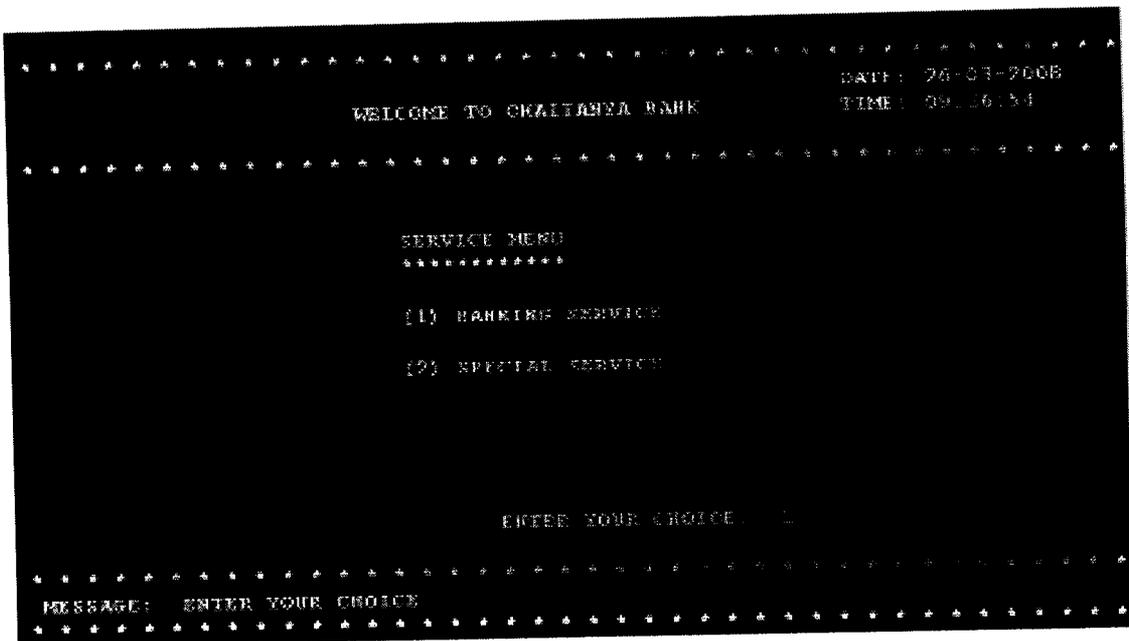
**Figure A 1.3 Service Menu**

**Figure A 1.4 Banking Service**

**Figure A 1.5 Fund Transfer**

Figure A 1.6 Cheque Book Request
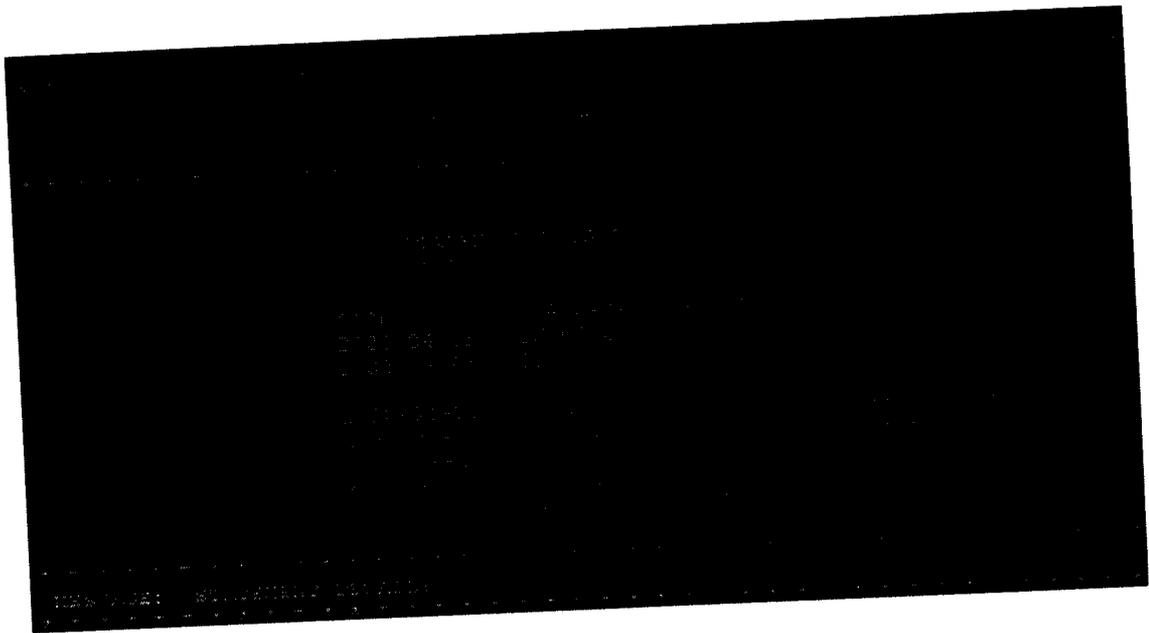
**Figure A 1.7 Statement Details**

**Figure A 1.8 Pin change Request**
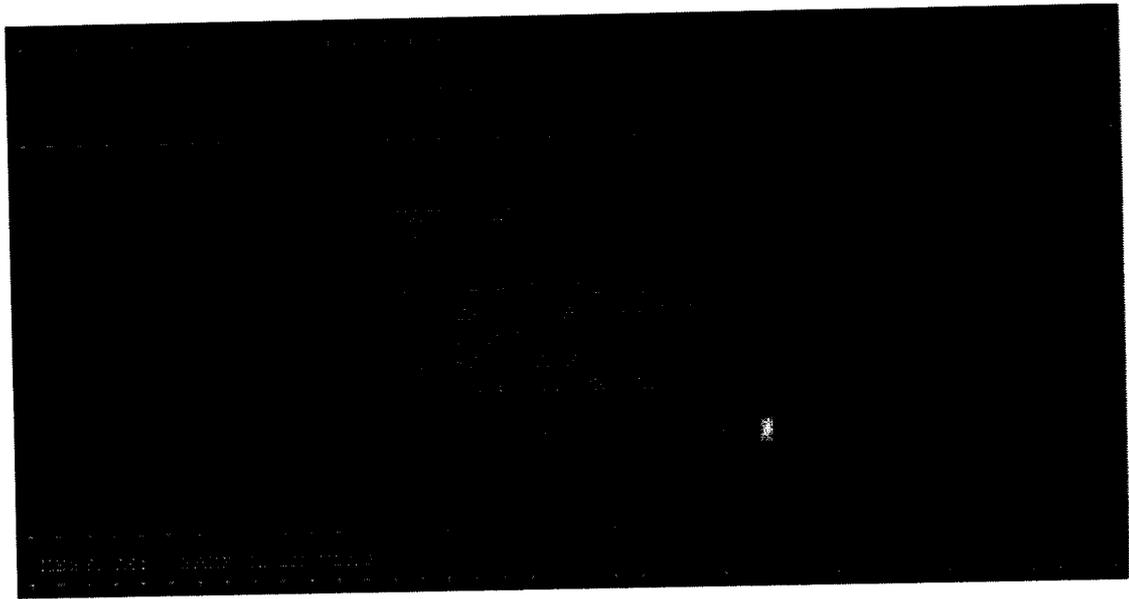
**Figure A 1.9 Bank Main Menu**
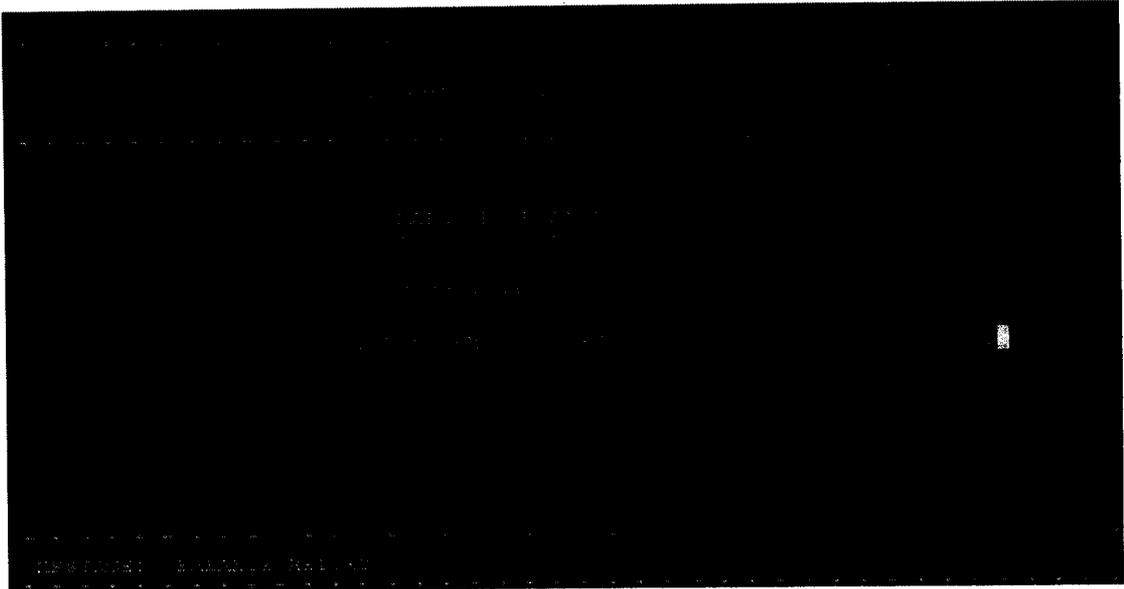
**Figure A 1.10 Balance Details**

**Figure A 1.11 Credit Card Payment**

**Figure A 1.12 Deposit**

**Figure A 1.13 Fast Cash**

**Figure A 1.14 Withdrawal details**

**Figure A 1.15 Institution Fees Payment**
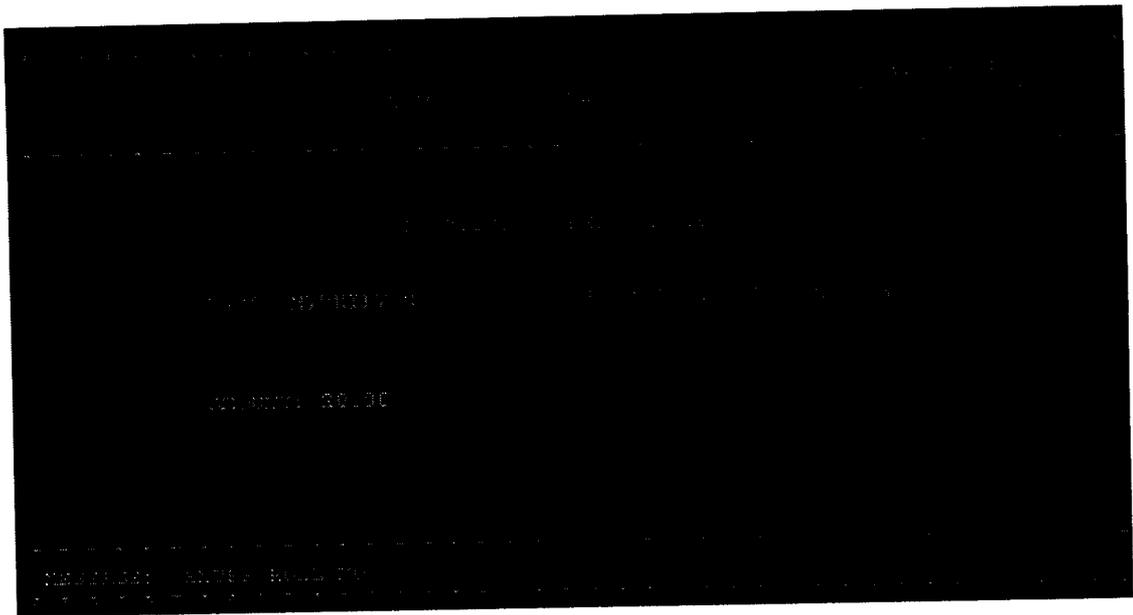
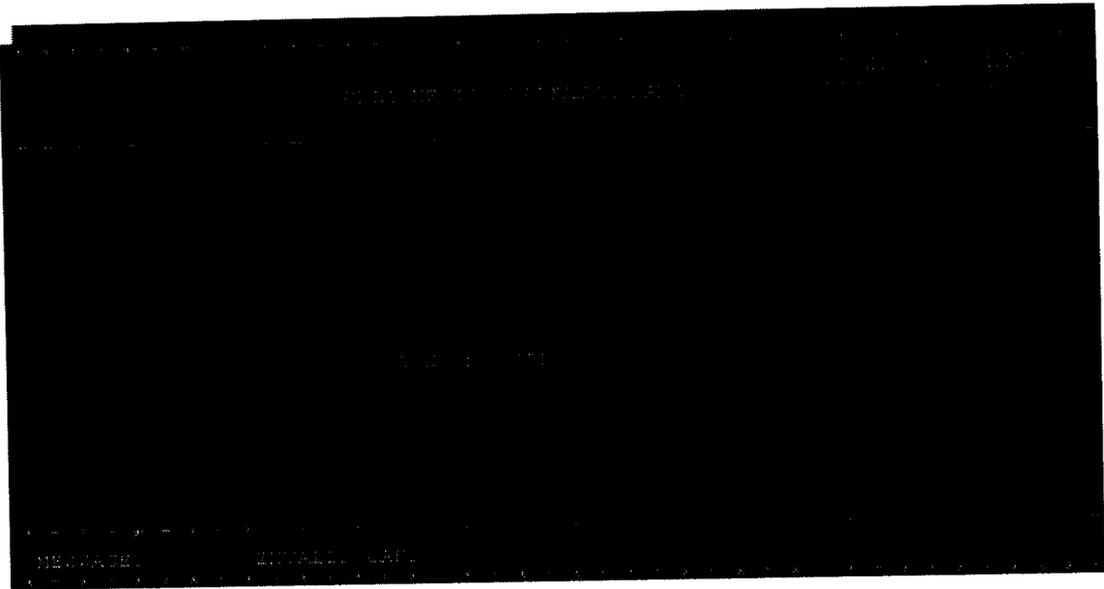**Figure A 1.16 Institution Fees Payment Details**
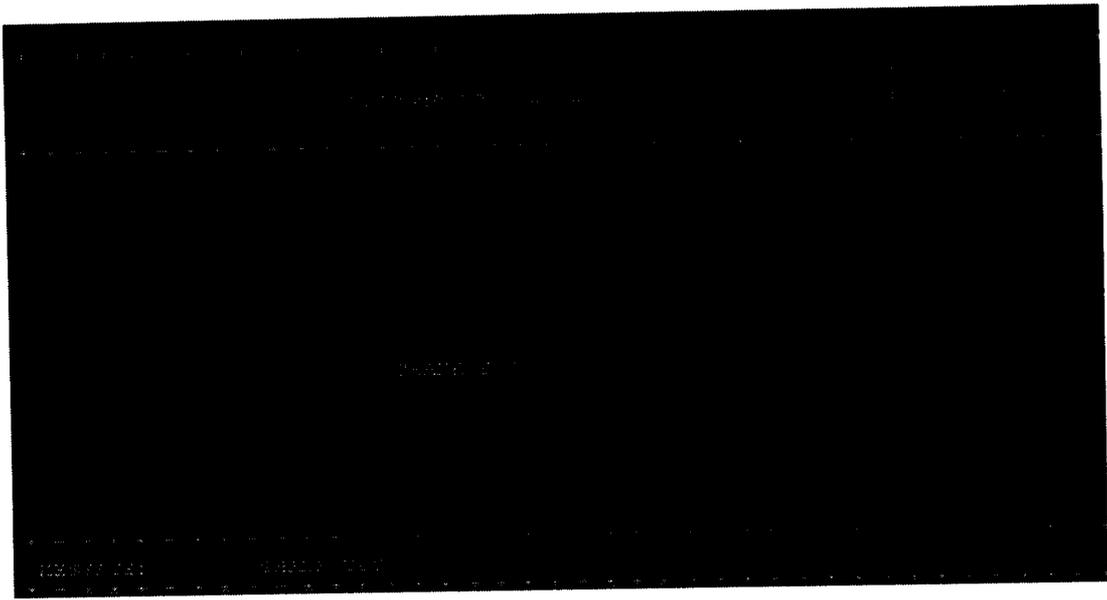
**Figure A 1.17 Card Rejected**

**Figure A 1.18 Invalid Card**

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