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## **1. Introduction**

A data flow diagram (DFD) illustrates how data flows through any system or process, beginning with one of the nine SDLC processes (System Development Life Cycle). DFD can provide an overview of the data that a system processes, the data transformations that occur, the data that are stored and used from those storages, and the direction of the flow of the results. The DFD's structure enables users to construct a hierarchy of particular diagrams from a wide overview. Typically, it is used to grasp the logical information flow of the system, define the requirements for human and automated systems, and establish the physical system design requirements. The data inputs, outputs, storage places, and transit patterns between each destination are shown using predefined symbols such as rectangles, circles, and arrows together with short text descriptors. A context diagram illustrates the interactions between external elements and an internal software system. It is a high-level look at the whole system that is meant to be seen at a glance. It shows the system as a single, high-level process and how it relates to other things. Logical and physical data flow diagrams are distinct types.

The logical data flow diagram illustrates how data traverses a system to perform specified business activities. It describes the methods followed, the data required for and created by each procedure, and the storage space required for storing the data. The physical data flow graphic explains how the logical data flow is implemented. The internal and external entities of a system, as well as the data moving into and out of these entities, are visually represented.

## **2. Objective**

- To understand the procedure of data flow of Sonali Bank Bahaddarhat Branch information system
- To create a context diagram and explain system overview
- To create both logical and physical data flow diagrams
- To validate the data flow diagram

## **3. The System Development Life Cycle (SDLC)**

A conceptual model for outlining steps to take when creating or updating a system throughout the course of its lifetime, the System Development Life Cycle (SDLC) is a popular method used in the field. It is a first-level management model for projects, outlining

everything that must be done from the start to the end. There are nine steps involved in the information system design process: requirements determination, requirements specification, feasibility analysis, final specifications, hardware study, system design, system implementation, system evaluation, and system modification.

The steps that can be used to implement the System Development Life Cycle (SDLC) in Sonali Bank Bahaddarhat Branch to upgrade the system are:

- I. Requirements Determinations:** An organization needs an information system in order to develop the current system and examine the management's needs. Information regarding the increase in human resources, the availability of ATMs and training centers, portal-based database systems, software upgrades, etc. is required for this purpose. By picking the applications with the highest importance, the managers were consulted to obtain this information.
- II. Requirements Specifications:** During this stage, a system analyst carefully analyzes the existing system to comprehend it. For example, this branch of Sonali Bank Limited needs a better user-friendly mobile banking application, proper human resource management and improved one stop-service.
- III. Feasibility analysis:** In this phase, it is decided whether the system can be implemented. A feasibility study evaluates the system's operation and development within a variety of constraints.
- IV. Final Specifications:** The analyst submits a feasibility report to the company and makes recommendations on the criteria that need to be altered. Following talks between the system analyst and the management, a final specification is created and approved for implementation.
- V. Hardware Study:** Based on the completed specification, it is necessary to identify the hardware configuration and accompanying software requirements for the application in question.
- VI. System Design:** The next stage is to create the logical design of the system. During this phase, files and databases are designed, test cases for the applications are created, and an implementation plan is established.
- VII. System Implementation:** Database creation, software development, user functional document creation, user interface design, and operational document-based testing all take place during this phase.

- VIII. System Evaluation:** The system analyst inquires of managers whether the system meets the criteria for better user-friendly mobile banking application, proper human resource management and improved one stop-service.
- IX. System Maintenance:** Finally, the system analyst corrects errors, adds or eliminates features as needed, continually monitors the system, and evaluates performance.

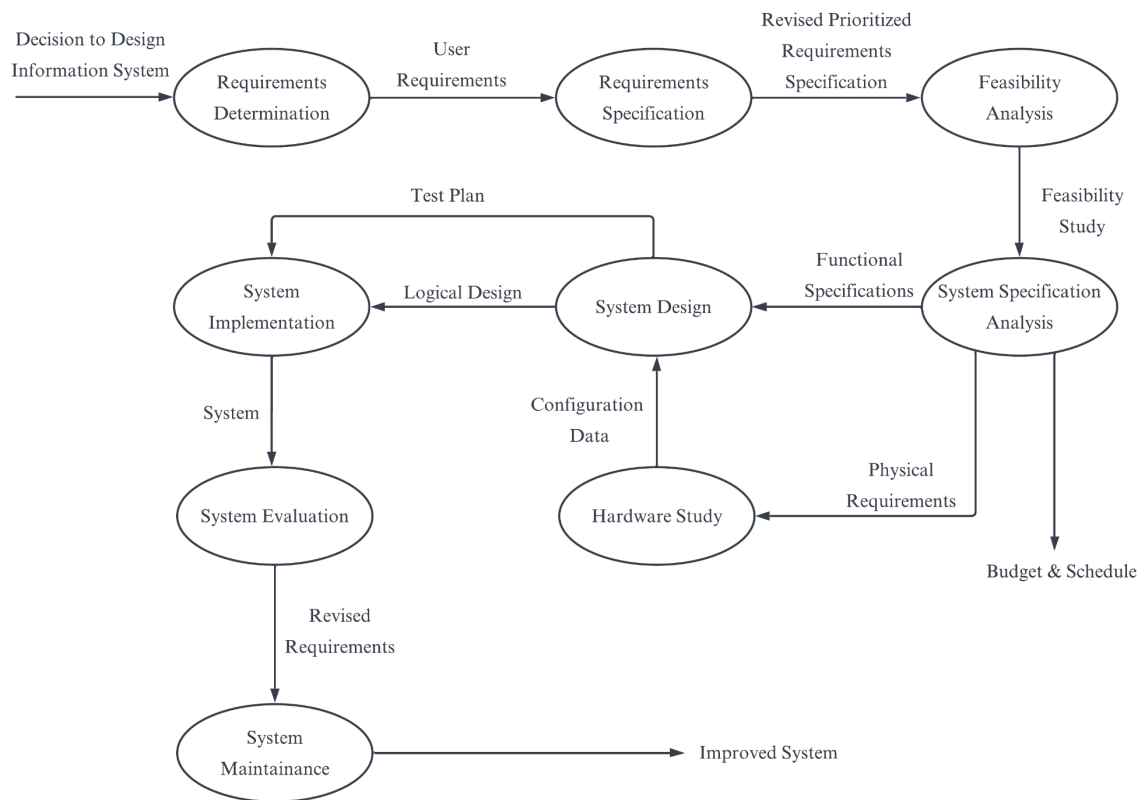


Figure 1: System Development Life Cycle

## 4. Data Flow Diagrams

### 4.1. Context Diagram

In the context diagram, the system being studied is shown as a single, high-level process before its connections to other things in the outside world are shown:

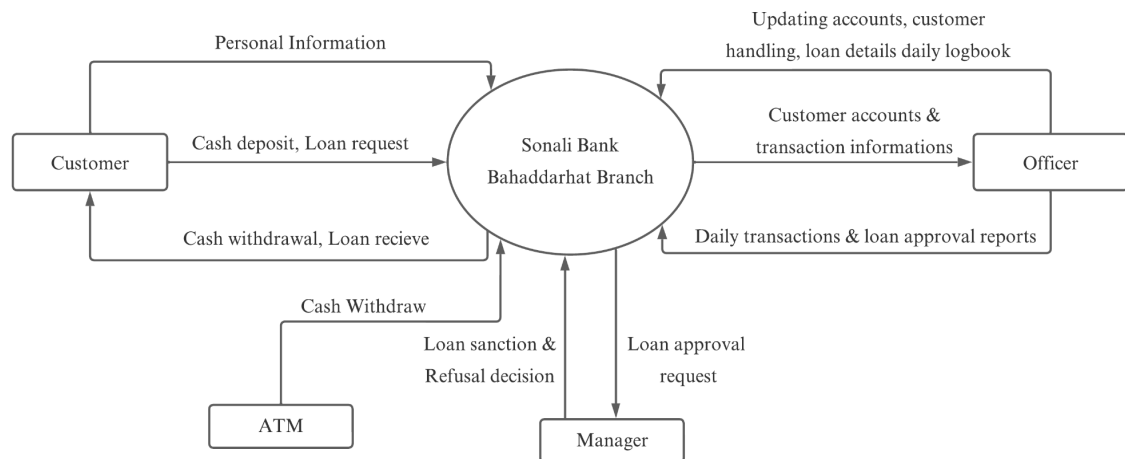


Figure 2: Context Diagram

## 4.2. Logical DFD

### I. Accounts

In this process, the customer obtains a form from the manager, fills it out with the relevant information, and submits it to open a bank account. After being reviewed, the application and supporting documentation for the customer are sent on for approval. An account number is given to the client following approval. Finally, the bank system stores the application and updates the account database. Here the check request and approval process is done through the relevant process, as this is a logical DFD.

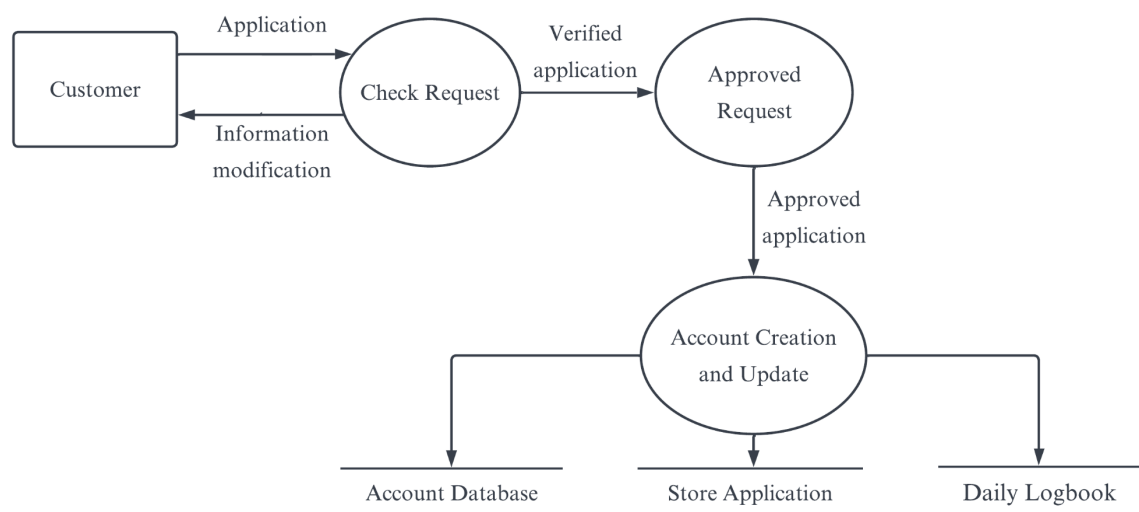


Figure 3: Logical DFD of Account Section

## II. Cash

The customer has been provided cash along with a slip or cheque for the transaction. Following that, received cash is transmitted to update the balance on that customer's account. After that the revised value is added to the daily log book. Besides, customers can also perform cash payment almost in the same manner by providing cheque or any form of slips. This will be verified likewise above and the account details and day log book will be updated eventually.

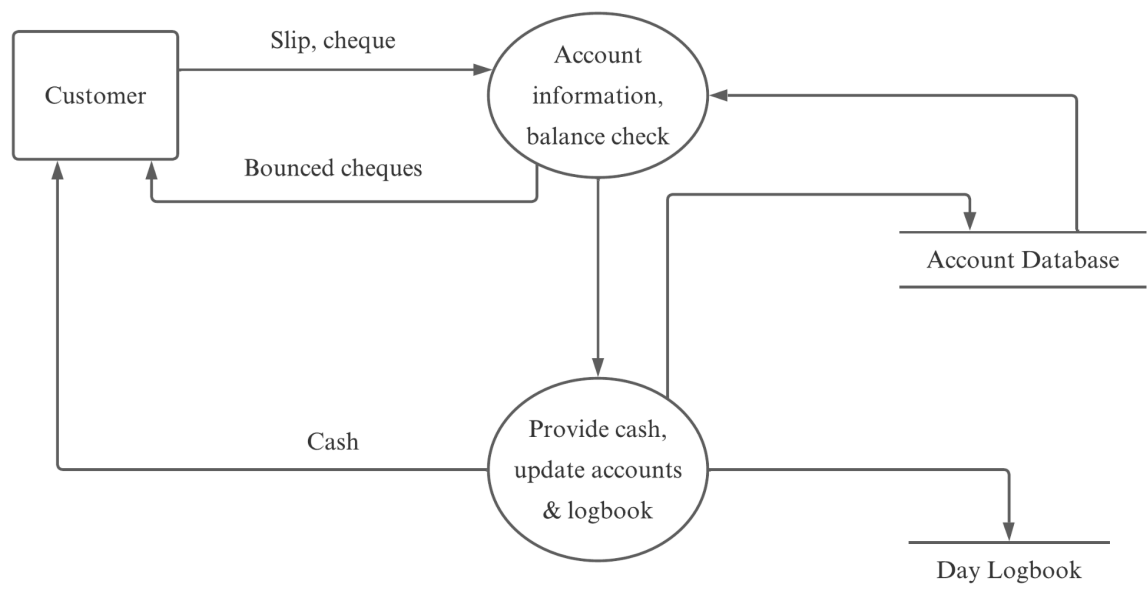


Figure 4: Logical DFD of Cash Section

## III. Loan

The logical data flow diagram's loan section explains how loans work. Most loans are approved based on the borrower's ability to pay. The customer requests for a loan by submitting a loan application. The loan request is therefore being received and verified by the verification and approval process. Also the account details of the customer will be checked for validating a loan application. If everything is fine, then the loan details and account details will be updated and the customer will get the loan. Otherwise the application will be counted as rejected.

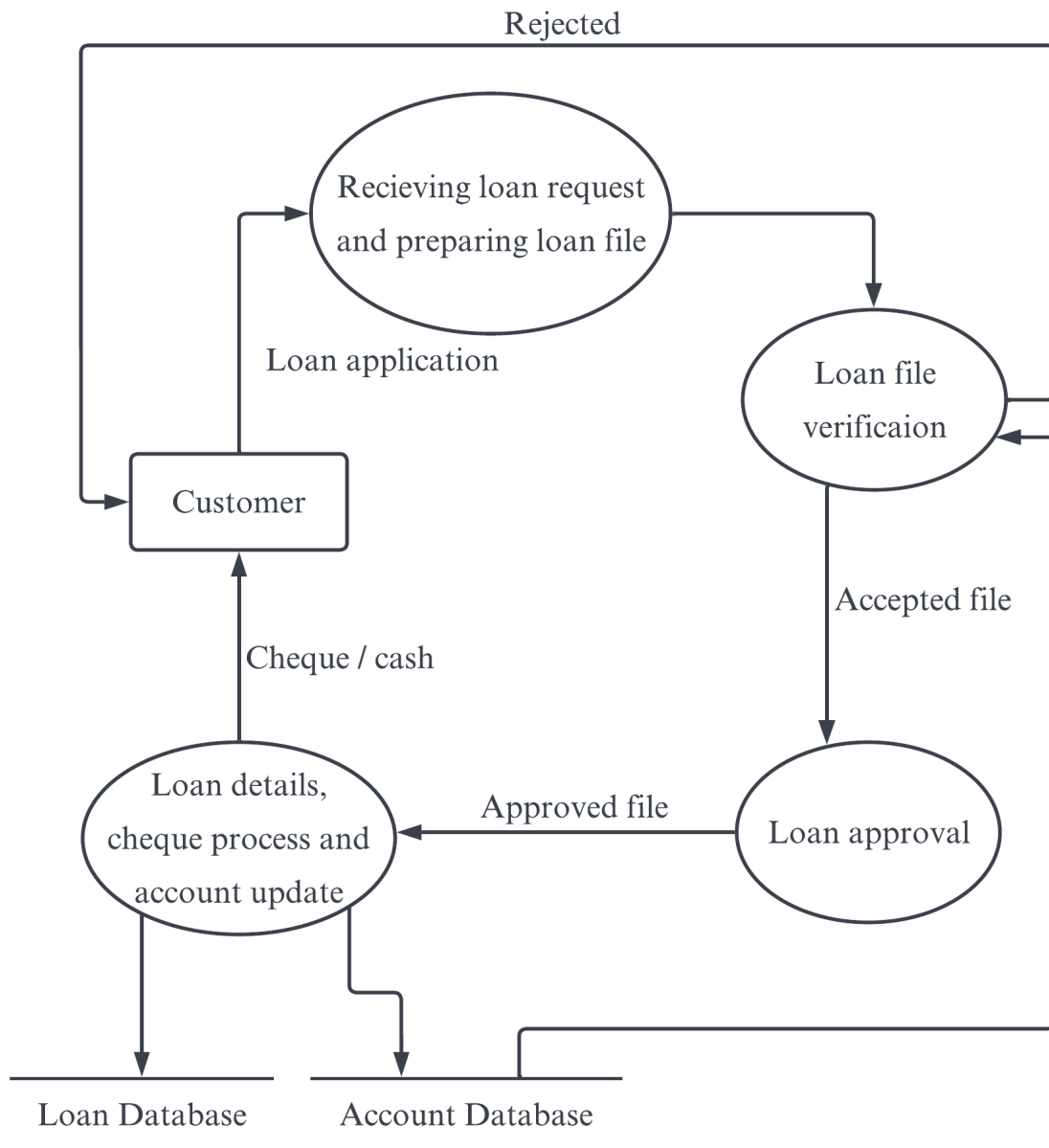


Figure 5: Logical DFD of Loan Section

#### IV. ATM

When the customer logs in the ATM system through credit or debit card the machine will automatically verify the account. For a successful confirmation the transaction will take place and the details will be updated in the respective databases like bank server database and account database. The customer will get the cash and slip for a valid withdrawal amount. But if the account

verification fails, the log in process will be rejected and returned back to the customer. Furthermore, even if the account verification gets successful but the amount is invalid then the transaction will not happen and will ask the user for a valid amount.

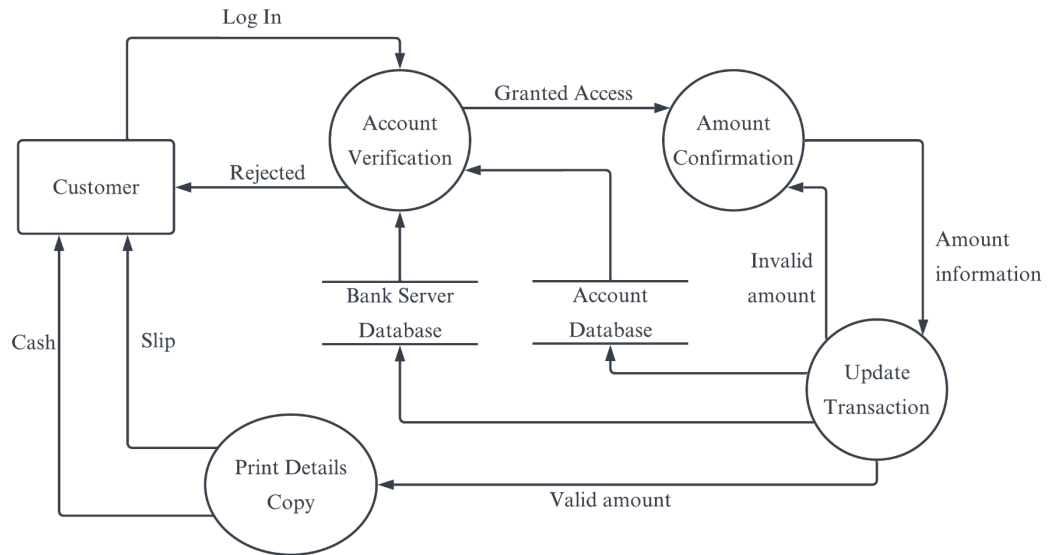


Figure 6: Logical DFD of ATM Section

## 4.3. Physical DFD

### I. Accounts

The customer fills out the account opening or closing form in order to complete the account opening and closing procedure. The customer also submits the required paperwork, including a national ID, a birth certificate, a picture of the customer, etc., and pays the amount to open a bank account. The General Officer examines the customer's application and supporting documentation. Again, the General officer is sending the details of the customer to the manager for final approval. If there are enough documents, the confirmation of the account opening and closing will be informed to the customer by the General Officer after managerial approval. In case of account closing, the remaining cash of the customer will be given to the customer by the General Manager. The account database has finally been updated. The



bank also keeps a copy of the customer's application and supporting documentation. So, the respective database will also be updated. As this is a physical DFD, the process mentioned in the logical DFD is done by the General officer and Manager.

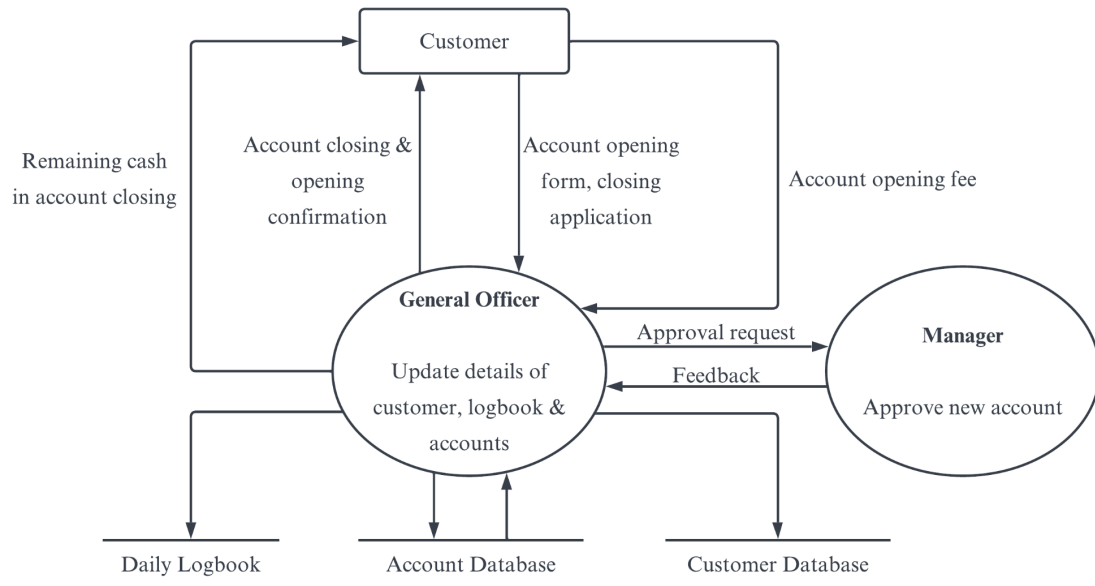


Figure 7: Physical DFD of Account Section

## II. Cash

In this process, customers will provide deposit cash, deposit slip and cheque to the officers. For deposit purposes, cash and deposit slips have to be given to the officers. For any withdrawal purpose, when the cheque will be given to the officers, they will return back the incorrect or bounced cheque. However for the correct one, customers will get withdrawal cash. The account database and daily log book will be updated.

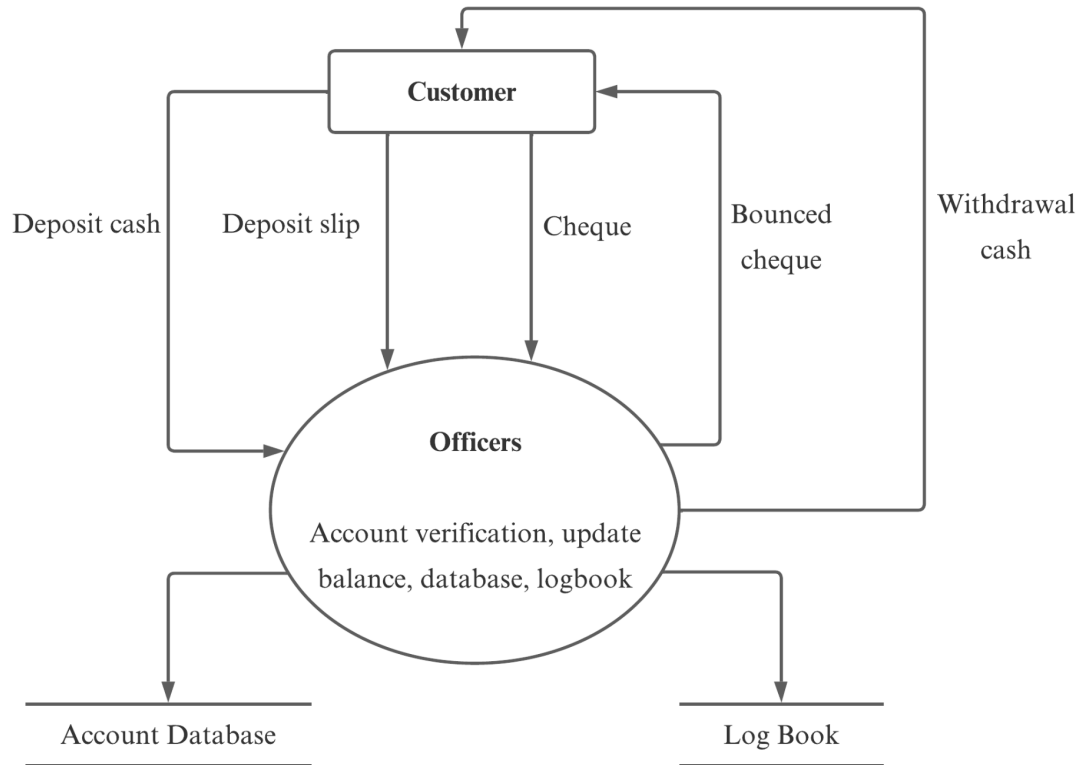


Figure 8: Physical DFD of Cash Section

### III. Loan

The customer provides the manager an application. In this circumstance, the loan system is crucial in determining whether or not the loan request is approved. The granter verifies the eligibility check before the loan system approves it, and only after it is approved else the loan application will be returned to the loan system for further approval. Following approval, the customer receives a payment schedule, as well as information to store in the loan database and store application database. If a loan request is denied, the borrower may reapply for a loan with proper justifications the next time

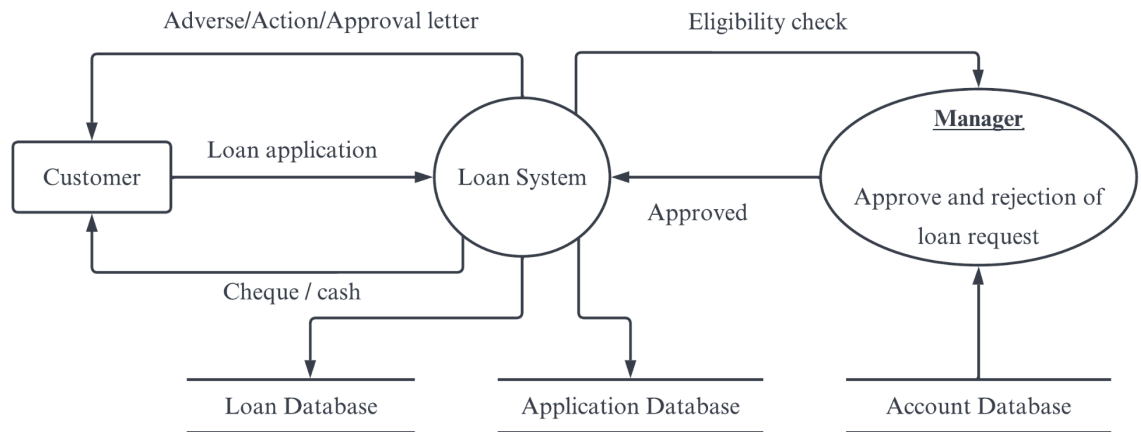


Figure 9: Physical DFD of Loan Section

#### IV. ATM

The users or the customers will provide the information like giving pin number and scanning the ATM card to the ATM Machine to complete the transaction. The user will also provide the desired amount that he wants to withdraw. This will also be considered as information to the ATM Booth from the user. The ATM Booth in reply will give feedback to the user. The consumer will receive the cash and receipt if the amount they want is less than or equal to the amount they can withdraw. On a successful transaction, the account database and bank server database will be updated accordingly.

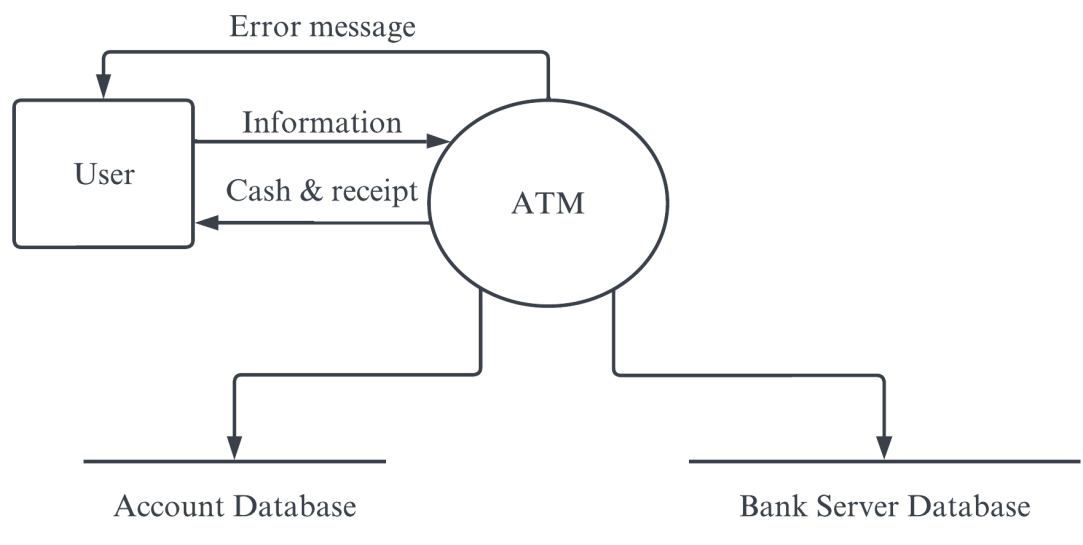


Figure 10: Physical DFD of ATM Section

## **5. Validating Data Flow Diagram**

### **5.1 Rules of DFD**

- I. Data can flow from: External entity to process, Process to external entity, Process to store and back, Process to process
- II. Data cannot flow from: External entity to external entity, External entity to store, Store to external entity, Store to store
- III. Illegal constructs in DFD: Loops not allowed in DFD, no splitting of a single data flow into many flows with different labels.

## **6. Process Description:**

**Manager:** In this branch of Sonali Bank Limited, the Manager plays many roles like sanctioning loans or takes refusal decisions. He also approves loan requests and new account creation in this branch. He is the main man to approve and to take any final decisions.

**Customer:** Firstly, customers can apply to create a new account or to close an existing account. He/she can apply for loans. They also can deposit or withdraw money from the bank. Customers can also use ATMs using their own debit/credit card.

**Officer:** Officers play a very important role in this branch. Basically, in any kind of operation, officers are much needed to operate any process. They can verify any kind of application, can check any kinds of information for queries, and update data stores like existing databases. Again, they provide any kind of information to the customer such as opening/closing account, cash deposit/withdrawal, cheque for loan etc. They also update the logbooks,

**ATM:** ATM is an important part of this branch. Customers use it to withdraw money as they need. Customers use their debit/credit card to withdraw the money.

## **7. Conclusion:**

In this report, logical and physical data flow diagrams were used to illustrate system data flows. We analyzed several areas and bank procedures, including account opening, cash deposits, cash withdrawals, etc. By transferring information from one sector to another, the

whole banking sector may be analyzed. Thus, we gained a comprehensive grasp of this bank's operations.