

# **Banking System**

Power BI Track

Fayoum Branch

Team “4”

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# Requirement Document

## 1. Introduction

### 1.1 Purpose

This document outlines the functional and structural requirements for the banking system, detailing its core business logic and operational entities. The system aims to manage districts, branches, employees, clients, accounts, transactions, loans, and other financial services efficiently.

### 1.2 Scope

The banking system will facilitate:

- District, branch, and department management
- Employee and ATM management
- Client registration and financial services
- Account, loan, wallet, and card management
- Transaction handling and reporting

### 1.3 Stakeholders

- **Bank Administrators** – Oversee overall system operations
- **Branch Managers** – Manage branch operations and employees
- **Employees** – Handle transactions, accounts, and client services
- **Clients** – End-users who hold accounts, loans, and financial products
- **System Administrators** – Maintain and secure the platform

## 2. System Requirements

### 2.1 District Management

- Each **district** must have:
  - District ID
  - Number
  - Region
  - Creation date
  - Status
- Each region consists of multiple districts.
- Each district consists of multiple branches.

### 2.2 Branch Management

- Each **branch** must have:
  - Branch ID
  - Name
  - Type (Retail or Credit)
  - Opening date
  - Capacity
- Branches must operate under a structured department model:
  - **Retail Branch:** Teller, Customer Service, Operation
  - **Credit Branch:** Teller, Customer Service, Operation, Credit Department
- A branch incurs **monthly expenses**, including:
  - Date
  - Invoice number
  - Vendor name
  - Amount
- **Expenses** must have:

- Expense ID
- Type

## 2.3 Department Management

- Each **department** must have:
  - Department ID
  - Name
  - Email
  - Phone number
  - Capacity
- Each department has:
  - Employees working under it
  - A manager overseeing its operations

## 2.4 Employee Management

- Each **employee** must have:
  - Employee ID
  - Name
  - Position
  - Salary
  - Address
  - Governorate, City
  - Date of birth
  - Employee number
  - Hiring date
  - Years of experience
  - Gender

- Performance score
- Employees are assigned to branches and departments.
- Employees may also hold managerial positions.

## 2.5 ATM Management

- Each branch may have one or more ATMs installed.
- Each ATM must have:
  - ATM ID
  - Cash capacity
  - Installation date
  - Last maintenance date
  - Status

## 2.6 Employee Target Management

- Targets must have:
  - Target ID
  - Amount
  - Start date
  - End date
- Each employee is assigned a target per product.

## 2.7 Client Management

- Each **client** must have:
  - Client ID
  - Name
  - Identification number
  - Gender

- Date of birth
  - Governorate, City
  - Address
  - Phone number
  - Email
  - Registration date
- Clients are assigned to the **branch** where they first opened their account.

## 2.8 Loan Management

- Each **loan** must have:
  - Loan ID
  - Name
  - Type
  - Interest rate
  - Interest payout
  - Start date
  - End date
  - Status
  - Loan amount
  - Loan term
- A client may hold one or more loans.

## **2.9 Wallet Management**

- Each **wallet** must have:
  - Wallet ID
  - Phone number
  - Status
  - Subscription date
  - Balance
- Each client may own only **one wallet**.

## **2.10 Account Management**

- Each **account** must have:
  - Account ID
  - Account number
  - Balance
  - Opening date
  - Status
- A client may hold **one or more accounts**.

## **2.11 Card Management**

- Each **card** must have:
  - Card ID
  - Card number
  - Expiry date
  - CVV
  - Status

## **2.12 Certificate Management**

- Each **certificate** must have:
  - Certificate ID
  - Interest rate
  - Payout interest
  - Issue date
  - Maturity date
  - Status
- Clients may invest in certificates.

## **2.13 Online Banking Management**

- Each **online banking account** must have:
  - Online Banking ID
  - Associated Account Number
  - Status
- Clients may apply for online banking.

## **2.14 ATM Transactions**

- Clients can use ATMs for:
  - Deposits
  - Withdrawals
  - Balance inquiries

## **2.15 Banking Services**

- The bank offers a range of **services**, each defined by:
  - Service ID

- Name
- Description
- Fee

## 2.16 Product Master

- The **product master** contains all available products, including loans and accounts.
- Each product must have:
  - Product ID
  - Name
  - Type
  - Status

## 2.17 Transaction Management

- Each **transaction** must have:
  - Transaction ID
  - Reference number
  - Type
  - Amount
  - Date
  - Status

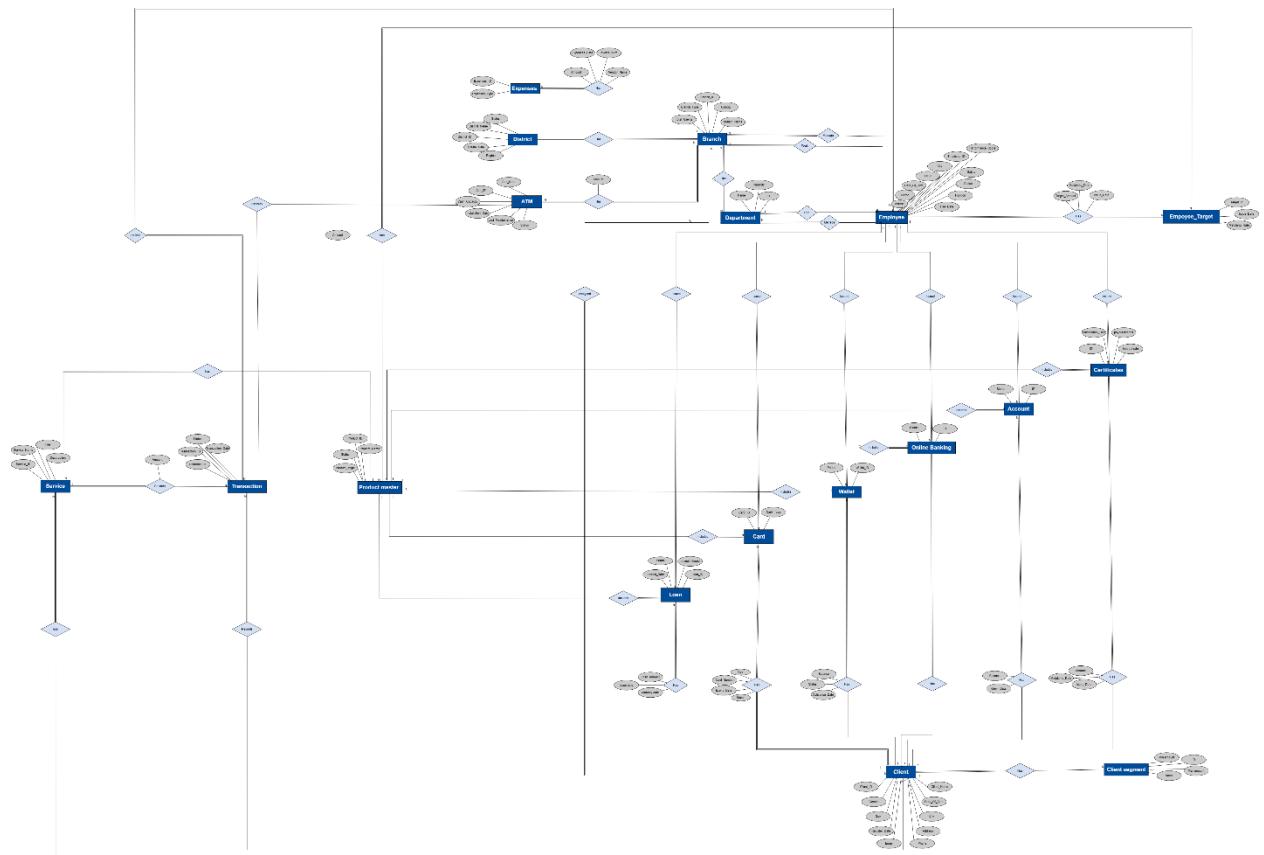
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## 3. Business Rules & Constraints

1. Clients may have multiple accounts, loans, and certificates but only one wallet.
2. A client must be assigned to a specific branch based on their first account opening.
3. Only authorized employees can approve loans and manage financial products.
4. ATMs must support deposit, withdrawal, and balance inquiry services.

## Entity Relationship Diagram “ERD”

The Entity-Relationship Diagram is a crucial step in designing the banking system database. It visually represents entities such as Customers, Accounts, Transactions, Loans, and Employees, along with their relationships. The ERD helps define the database structure, ensuring proper data organization and integrity. Using Draw.io, the diagram illustrates key attributes, primary keys, and foreign key connections, forming the foundation for further normalization and implementation.

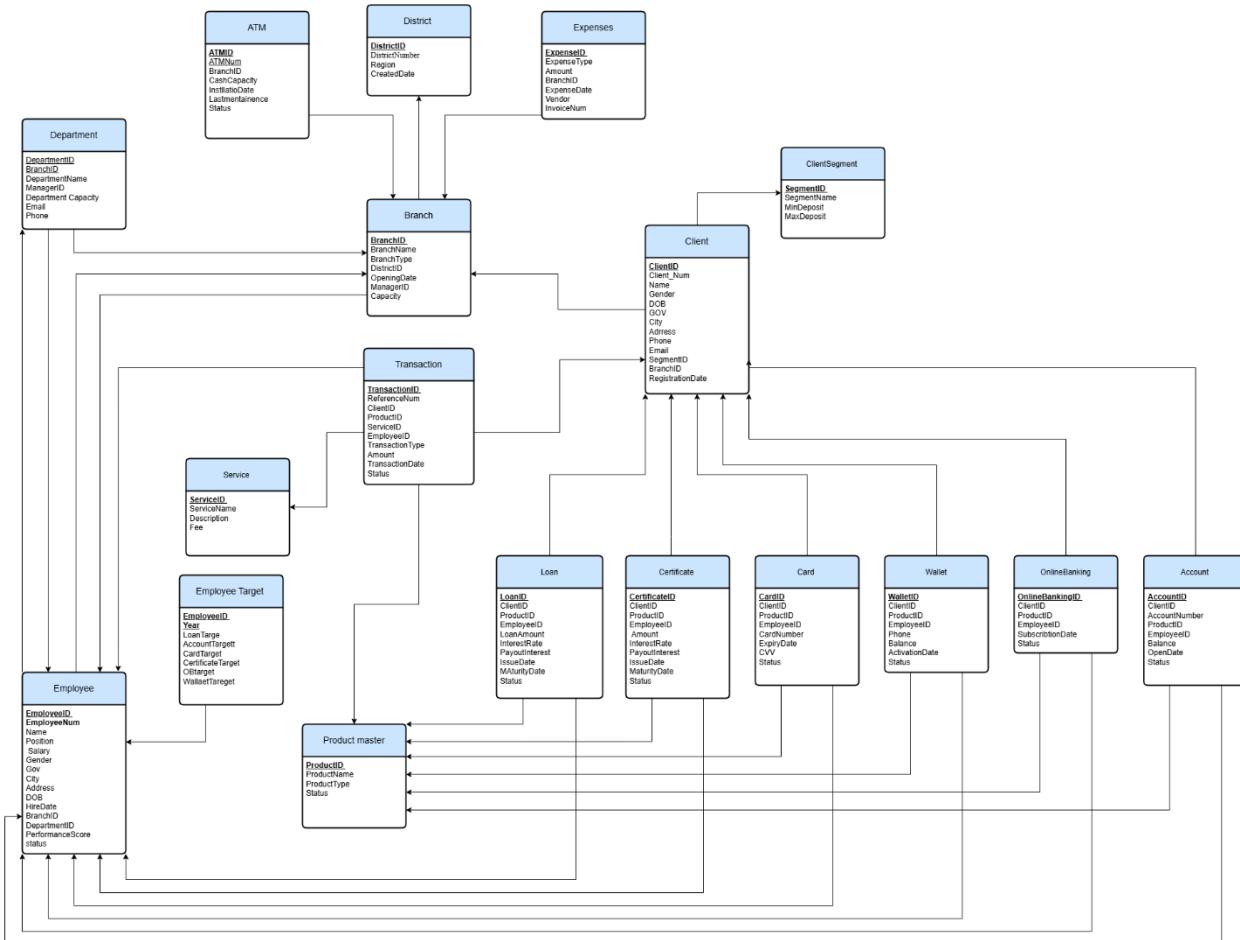


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## Mapping & Normalization

**Mapping Step:** Mapping translates the ERD into a relational schema by defining tables, attributes, primary keys, and foreign keys. This step ensures that all relationships and constraints are correctly implemented, forming the base structure of the database. Using Draw.io, the mapped schema provides a clear blueprint for database creation.

**Normalization Step:** Normalization organizes the database to eliminate redundancy and improve efficiency. It involves transforming tables through 1NF, 2NF, and 3NF, ensuring data integrity and reducing anomalies. Using Draw.io, the process restructures tables while maintaining necessary relationships for optimal performance.



[https://app.diagrams.net/#G1dBAWHvYEC\\_eEPGJVF13afcYDwkmpTL4b#%7B%22pageId%22%3A%229n8i0K7Nak9TINCyQXnJ%22%67D](https://app.diagrams.net/#G1dBAWHvYEC_eEPGJVF13afcYDwkmpTL4b#%7B%22pageId%22%3A%229n8i0K7Nak9TINCyQXnJ%22%67D)

## Implementing Tables in SQL Server

Designing and implementing the database schema in SQL Server Management Studio (SSMS). Using SQL scripts, tables are created with appropriate data types, constraints, primary keys (PK), and foreign keys (FK) to maintain data integrity. Each table represents a real-world entity, such as Customers, Accounts, Transactions, and Loans, ensuring a structured and efficient database. This step lays the foundation for data storage, retrieval, and management within the banking system.

### District Table:

```
CREATE TABLE District (
    DistrictID INT PRIMARY KEY,
    DistrictNumber INT NOT NULL,
    Region VARCHAR(30) NOT NULL,
    CreatedDate DATETIME NOT NULL,
);
```

---

### Branch Table:

```
CREATE TABLE Branch (
    BranchID INT PRIMARY KEY,
    BranchName VARCHAR(30) NOT NULL UNIQUE,
    BranchType VARCHAR(10) NOT NULL,
    DistrictID INT NOT NULL,
    OpeningDate DATETIME NOT NULL,
    ManagerID INT
);
ALTER TABLE Branch ADD CONSTRAINT FK_District FOREIGN KEY (DistrictID) REFERENCES
District(DistrictID) ON DELETE CASCADE;
```

```
ALTER TABLE Branch ADD CONSTRAINT FK_Employee FOREIGN KEY (ManagerID) REFERENCES Employee(EmployeeID)
```

#### **Department Table:**

```
CREATE TABLE Department (
    DepartmentID INT PRIMARY KEY,
    DepartmentName VARCHAR(200) NOT NULL,
    BranchID INT NOT NULL,
    ManagerID INT,
    DepartmentCapacity INT,
    Email VARCHAR(200) UNIQUE,
    Phone VARCHAR(20),
    FOREIGN KEY (BranchID) REFERENCES Branch(BranchID) ON DELETE CASCADE,
);
```

```
ALTER TABLE Department ADD CONSTRAINT FK_Department_Employee FOREIGN KEY(ManagerID) REFERENCES Employee(EmployeeID) ON DELETE SET NULL
```

```
ALTER TABLE Department ADD CONSTRAINT UN_Name_BranchID
UNIQUE(BranchID,DepartmentName)
```

---

#### **Employee Table:**

```
CREATE TABLE Employee (
    EmployeeID INT PRIMARY KEY,
    EmployeeNum INT NOT NULL UNIQUE,
    Name VARCHAR(200) NOT NULL,
    Position VARCHAR(200) NOT NULL,
    Salary DECIMAL(10,2) NOT NULL CHECK (Salary > 0),
    Gender VARCHAR(10) CHECK (Gender IN ('Male', 'Female', 'Other')) NOT NULL,
    Gov VARCHAR(20),
    City VARCHAR(30),
```

```

        Address VARCHAR(80) NOT NULL,
        DOB DATE NOT NULL,
        HireDate DATETIME NOT NULL,
        BranchID INT NOT NULL,
        DepartmentID INT NOT NULL,
        PerformanceScore INT CHECK (PerformanceScore BETWEEN 0 AND 100),
        Status VARCHAR(15) NOT NULL CHECK (Status IN ('Active', 'Inactive', 'Terminated')),
    );
ALTER TABLE Employee ADD CONSTRAINT FK_Branch FOREIGN KEY (BranchID) REFERENCES
Branch(BranchID);
ALTER TABLE Employee ADD CONSTRAINT FK_Department FOREIGN KEY (DepartmentID)
REFERENCES Department(DepartmentID)
ALTER TABLE Employee ADD CONSTRAINT chk_EmployeeNum_Length CHECK (EmployeeNum
BETWEEN 100000 AND 999999)

```

---

**ClientSegment Table:**

```

CREATE TABLE ClientSegment (
    SegmentID INT PRIMARY KEY,
    SegmentName VARCHAR(255) NOT NULL UNIQUE,
    MinDeposit INT NOT NULL,
    MaxDeposit INT NOT NULL );

```

---

**Client Table:**

```

CREATE TABLE Client (
    ClientID INT PRIMARY KEY,
    ClientNum INT NOT NULL UNIQUE,

```

```

Name VARCHAR(255) NOT NULL,
Gender VARCHAR(10) CHECK (Gender IN ('Male', 'Female', 'Other')) NOT NULL,
DOB DATE,
Gov VARCHAR(25) NOT NULL,
City VARCHAR(30) NOT NULL,
Address VARCHAR(80) NOT NULL,
Phone VARCHAR(20) UNIQUE NOT NULL,
Email VARCHAR(200) NOT NULL,
SegmentID INT NOT NULL,
BranchID INT NOT NULL,
RegistrationDate DATETIME NOT NULL,
);

ALTER TABLE Client ADD CONSTRAINT FK_ClientSegment FOREIGN KEY (SegmentID)
REFERENCES ClientSegment(SegmentID);

ALTER TABLE Client ADD CONSTRAINT FK_Branch_Client FOREIGN KEY (BranchID) REFERENCES
Branch(BranchID);

ALTER TABLE Client ADD CONSTRAINT chk_ClientNum_Length CHECK (ClientNum BETWEEN
1000000000 AND 9999999999);

```

---

#### **Service Table:**

```

CREATE TABLE Service (
ServiceID INT PRIMARY KEY,
ServiceName VARCHAR(150) NOT NULL UNIQUE,
Description TEXT NOT NULL,
Fee DECIMAL(10,2) CHECK (Fee >= 0) NOT NULL
);

```

---

**Transaction Table:**

```
CREATE TABLE Transactions (
    TransactionID INT PRIMARY KEY,
    ReferenceNum INT NOT NULL UNIQUE,
    ClientID INT NOT NULL,
    ProductID INT,
    ServiceID INT,
    EmployeeID INT,
    TransactionType VARCHAR(30) NOT NULL,
    Amount DECIMAL(15,2) CHECK (Amount > 0) NOT NULL,
    TransactionDate DATETIME NOT NULL,
    Status VARCHAR(15) NOT NULL CHECK (Status IN ('Completed', 'Pending', 'Failed')),
);

ALTER TABLE Transactions ADD CONSTRAINT FK_Client_Tr FOREIGN KEY (ClientID) REFERENCES Client(ClientID) ON DELETE CASCADE;

ALTER TABLE Transactions ADD CONSTRAINT FK_ProductMaster_Tr FOREIGN KEY (ProductID)
REFERENCES ProductMaster(ProductID) ON DELETE SET NULL;

ALTER TABLE Transactions ADD CONSTRAINT FK_Service_Tr FOREIGN KEY (ServiceID)
REFERENCES Service(ServiceID) ON DELETE SET NULL;

ALTER TABLE Transactions ADD CONSTRAINT FK_Employee_Tr FOREIGN KEY (EmployeeID)
REFERENCES Employee(EmployeeID) ON DELETE SET NULL;

ALTER TABLE Transactions ADD CONSTRAINT DF_TransactionDate DEFAULT GETDATE() FOR
TransactionDate;
```

---

**EmployeeTarget Table:**

```
CREATE TABLE EmployeeTarget (
```

```

EmployeeID INT NOT NULL,
Year SMALLINT NOT NULL,
LoanTarget DECIMAL(15,2) CHECK (LoanTarget > 0),
AccountTarget INT CHECK (AccountTarget > 0),
WalletTarget INT CHECK (WalletTarget > 0),
CardTarget INT CHECK (CardTarget > 0),
OBTarget INT CHECK (OBTarget > 0),
CertificateTarget INT CHECK (CertificateTarget > 0)

);

ALTER TABLE EmployeeTarget ADD CONSTRAINT PK_EmployeeID_Year PRIMARY KEY
(EmployeeID, Year )

ALTER TABLE EmployeeTarget ADD CONSTRAINT FK_Employee_Target FOREIGN KEY
(EmployeeID) REFERENCES Employee(EmployeeID) ON DELETE CASCADE;

ALTER TABLE EmployeeTarget ADD CONSTRAINT FK_ProductMaster_Target FOREIGN KEY
(ProductID) REFERENCES ProductMaster(ProductID) ON DELETE CASCADE

```

---

#### **ProductMaster Table:**

```

CREATE TABLE ProductMaster (
    ProductID INT PRIMARY KEY,
    ProductName VARCHAR(200) NOT NULL UNIQUE,
    ProductType VARCHAR(30) NOT NULL,
    Status VARCHAR(15) NOT NULL CHECK (Status IN ('Active', 'Inactive')) );

```

---

#### **Loan Table:**

```

CREATE TABLE Loan (
    LoanID INT PRIMARY KEY,

```

```

ClientID INT NOT NULL,
    ProductID INT NOT NULL,
    EmployeeID INT NOT NULL,
    LoanAmount DECIMAL(15,2) CHECK (LoanAmount > 0) NOT NULL,
    InterestRate DECIMAL(5,2) CHECK (InterestRate >= 0) NOT NULL,
    PayoutInterst INT CHECK (PayoutInterst > 0) NOT NULL,
    IssueDate DATETIME NOT NULL,
    MaturityDate DATETIME NOT NULL,
    Status VARCHAR(15) NOT NULL CHECK (Status IN ('Active', 'Closed')),
);

ALTER TABLE Loan ADD CONSTRAINT FK_Client_Loan FOREIGN KEY (ClientID) REFERENCES
Client(ClientID) ON DELETE CASCADE;

ALTER TABLE Loan ADD CONSTRAINT FK_Master_Loan FOREIGN KEY (ProductID) REFERENCES
ProductMaster(ProductID);

ALTER TABLE Loan ADD CONSTRAINT FK_Emp_Loan FOREIGN KEY (EmployeeID) REFERENCES
Employee(EmployeeID)

```

---

#### **Account Table:**

```

CREATE TABLE Account (
    AccountID INT PRIMARY KEY,
    ClientID INT,
    AccountNumber VARCHAR(20) NOT NULL UNIQUE,
    ProductID INT NOT NULL,
    EmployeeID INT NOT NULL,
    Balance DECIMAL(15,2) DEFAULT 0 CHECK (Balance >= 0),
    OpenDate DATETIME NOT NULL,

```

```

Status VARCHAR(50) NOT NULL CHECK (Status IN ('Active', 'Inactive', 'Closed')),

);

ALTER TABLE Account ADD CONSTRAINT FK_Client_Account FOREIGN KEY (ClientID)
REFERENCES Client(ClientID) ON DELETE NO ACTION;

ALTER TABLE Account ADD CONSTRAINT FK_Master_Account FOREIGN KEY (ProductID)
REFERENCES ProductMaster(ProductID);

ALTER TABLE Account ADD CONSTRAINT FK_Emp_Account FOREIGN KEY (EmployeeID)
REFERENCES Employee(EmployeeID)
-----
```

**Wallet Table:**

```

CREATE TABLE Wallet (
    WalletID INT PRIMARY KEY,
    ClientID INT NOT NULL,
    ProductID INT NOT NULL,
    EmployeeID INT NOT NULL,
    Phone VARCHAR(20) UNIQUE NOT NULL,
    Balance DECIMAL(15,2) CHECK (Balance >= 0) DEFAULT 0,
    ActivationDate DATETIME NOT NULL,
    Status VARCHAR(15) NOT NULL CHECK (Status IN ('Active', 'Inactive')),
);

ALTER TABLE Wallet ADD CONSTRAINT FK_Client_Wallet FOREIGN KEY (ClientID) REFERENCES
Client(ClientID) ON DELETE CASCADE;

ALTER TABLE Wallet ADD CONSTRAINT FK_Master_Wallet FOREIGN KEY (ProductID)
REFERENCES ProductMaster(ProductID);

ALTER TABLE Wallet ADD CONSTRAINT FK_Emp_Wallet FOREIGN KEY (EmployeeID) REFERENCES
Employee(EmployeeID)
```

```

CREATE TABLE Card (
    CardID INT PRIMARY KEY,
    ClientID INT NOT NULL,
    ProductID INT NOT NULL,
    EmployeeID INT NOT NULL,
    CardNumber VARCHAR(20) NOT NULL UNIQUE,
    ExpiryDate DATETIME NOT NULL,
    CVV INT CHECK (CVV BETWEEN 100 AND 999) NOT NULL,
    Status VARCHAR(15) NOT NULL CHECK (Status IN ('Active', 'Blocked', 'Expired')),
);
ALTER TABLE Card ADD CONSTRAINT FK_Client_Card FOREIGN KEY (ClientID) REFERENCES Client(ClientID) ON DELETE CASCADE;
ALTER TABLE Card ADD CONSTRAINT chk_CardNumber_Length CHECK (LEN(CardNumber) = 16);
ALTER TABLE Card ADD CONSTRAINT chk_CardNumber_Format CHECK (CardNumber NOT LIKE '%[^0-9]%' );
ALTER TABLE Card ADD CONSTRAINT FK_Master_Card FOREIGN KEY (ProductID) REFERENCES ProductMaster(ProductID);
ALTER TABLE Card ADD CONSTRAINT FK_Emp_Card FOREIGN KEY (EmployeeID) REFERENCES Employee(EmployeeID)

```

---

```

CREATE TABLE Certificate (
    CertificateID INT PRIMARY KEY,
    ClientID INT NOT NULL,
    ProductID INT NOT NULL,
    EmployeeID INT NOT NULL,

```

```

        Amount DECIMAL(15,2) CHECK (Amount > 0) NOT NULL,
        InterestRate DECIMAL(5,2) CHECK (InterestRate >= 0) NOT NULL,
        PayoutInterst INT CHECK (PayoutInterst > 0) NOT NULL,
        IssueDate DATETIME NOT NULL,
        MaturityDate DATETIME NOT NULL,
        Status VARCHAR(15) NOT NULL CHECK (Status IN ('Active', 'Inactive'))
    );
ALTER TABLE Certificate ADD CONSTRAINT FK_Client_Certificate FOREIGN KEY (ClientID)
REFERENCES Client(ClientID) ON DELETE CASCADE;
ALTER TABLE Certificate ADD CONSTRAINT FK_Master_Certificate FOREIGN KEY (ProductID)
REFERENCES ProductMaster(ProductID);
ALTER TABLE Certificate ADD CONSTRAINT FK_Emp_Certificate FOREIGN KEY (EmployeeID)
REFERENCES Employee(EmployeeID)

```

---

```

CREATE TABLE OnlineBanking (
    OnlineBankingID INT PRIMARY KEY,
    ClientID INT NOT NULL,
    ProductID INT NOT NULL,
    EmployeeID INT NOT NULL,
    SubscriptionDate DATE NOT NULL ,
    Status VARCHAR(15) NOT NULL CHECK (Status IN ('Active', 'Inactive')),
);

```

```

ALTER TABLE OnlineBanking ADD CONSTRAINT FK_Client_OnlineBanking FOREIGN KEY (ClientID)
REFERENCES Client(ClientID) ON DELETE CASCADE;
ALTER TABLE OnlineBanking ADD CONSTRAINT FK_Master_OnlineBanking FOREIGN KEY
(ProductID) REFERENCES ProductMaster(ProductID);

```

```
ALTER TABLE OnlineBanking ADD CONSTRAINT FK_Emp_OnlineBanking FOREIGN KEY  
(EmployeeID) REFERENCES Employee(EmployeeID)
```

---

```
CREATE TABLE ATM (  
    ATMID INT PRIMARY KEY,  
    ATMNum INT NOT NULL,  
    BranchID INT NOT NULL,  
    CashCapacity INT NOT NULL,  
    InstallationDate Date NOT NULL,  
    LastMaintenance Date NOT NULL,  
    Status VARCHAR(15) NOT NULL CHECK (Status IN ('Active', 'Inactive'))  
);
```

```
ALTER TABLE ATM ADD CONSTRAINT FK_Branch_ATM FOREIGN KEY (BranchID) REFERENCES  
Branch(BranchID) ON DELETE CASCADE
```

---

```
CREATE TABLE Expenses (  
    ExpenseID INT PRIMARY KEY,  
    ExpenseType VARCHAR(255) NOT NULL,  
    Amount DECIMAL(15,2) CHECK (Amount >= 0) NOT NULL,  
    BranchID INT NOT NULL,  
    ExpenseDate DATETIME NOT NULL,  
    InvoiceNum varchar(60),  
    Vendor VARCHAR(100) NOT NULL
```

);

ALTER TABLE Expenses ADD CONSTRAINT FK\_Branch\_Expenses FOREIGN KEY (BranchID)  
REFERENCES Branch(BranchID) ON DELETE CASCADE

## Data Generation

ChatGPT was used to generate synthetic banking data for analysis. It helps create realistic datasets for clients, transactions, employees, and ATMs while ensuring data diversity and consistency. This process is useful for training machine learning models, database testing, and report generation.

### Prompt Sample:

**District table:** Generate a dataset for a Districts table containing at least 50 records. The table should include the following columns:

1. ID (Unique identifier for each district)
2. District Number (Assigned number for the district)
3. Region (Name of the region the district belongs to)
4. Created Date (The date when the district was officially registered or created)

Ensure the data is realistic and includes a variety of regions from different governorates. The created dates should be in MM/DD/YYYY format and span from the year 2000 onwards. Output the result in a structured table format (CSV)

A	B	C	D
id	district number	region	created date
1	1	Damietta	11/30/2001
2	1	Assiut	1/8/2013
3	1	Gharbia	7/17/2010
4	1	Cairo	1/14/2023
5	2	Assiut	8/30/2006
6	1	Fayoum	5/16/2001
7	1	Port Said	12/4/2017
8	1	Beheira	1/24/2017
9	1	Suez	3/4/2017
10	1	Dakahlia	10/7/2021

**Branch table:** Generate a dataset for a banking Branches table with at least 100 records. The table should include the following columns:

1. Branch ID (Unique identifier for each branch)
2. Branch Name (Name of the branch)
3. Branch type (whether credit or retail)
4. District ID (Reference to the district where the branch is located “FK”))
5. Opening date (date when the branch opened)
6. Capacity (branch employee capacity)
7. ManagerID (reference to employee table “FK”))

BranchID	BranchName	BranchType	DistrictID	OpeningDate	Capacity	ManagerID
1	Abnub	Retail	44	11/8/2020 0:00	15	241
2	Damanhour	Retail	8	4/24/2017 0:00	15	1366
3	Al Fayrouz	Retail	49	12/7/2000 0:00	15	642
4	Zamalek	Credit	4	4/14/2023 0:00	20	189
5	Dodd	Retail	38	3/19/2008 0:00	15	351
6	Sanabo	Retail	44	11/8/2020 0:00	15	1673
7	Edfu	Retail	48	2/3/2003 0:00	15	270
8	Ibshaway	Credit	6	8/14/2001 0:00	20	92
9	Hurghada	Retail	42	6/1/2019 0:00	15	358
10	Safaga	Retail	47	4/6/2015 0:00	15	1061
11	Abu Simbel	Retail	21	10/9/2024 0:00	15	329
12	Qus	Credit	19	10/16/2014 0:00	20	341
13	Haram	Credit	50	12/24/2024 0:00	20	1095
14	Port Fouad	Credit	37	1/20/2014 0:00	20	923
15	Belqas	Retail	23	6/21/2003 0:00	15	347
16	Mallawi	Credit	28	12/10/2001 0:00	20	953
17	El Shuhada	Retail	49	12/7/2000 0:00	15	337
18	New Tushka	Credit	39	4/8/2021 0:00	20	450
19	Downtown	Retail	18	6/27/2018 0:00	15	175
20	Itsa	Retail	13	12/29/2000 0:00	15	388
21	Sharm El Sheikh	Credit	32	3/10/2015 0:00	20	795
22	Rosetta	Retail	34	1/15/2003 0:00	15	1113
23	Kafr El Dawwar	Retail	20	12/19/2007 0:00	15	1006
24	Daraw	Credit	39	4/8/2021 0:00	20	1454
25	Kharga	Retail	22	8/25/2024 0:00	15	787

**Department table:** Generate a dataset for Departments table containing at least 300 records.

The table should include the following columns:

1. DepartmentID (Unique identifier for each department)
2. DepartmentName (Name of the department, e.g., Teller, Customer Service, Operation, Credit)
3. BranchID (The branch to which the department belongs “FK”))
4. DepartmentCapacity (Maximum number of employees in the department)
5. Email (A professional email for the department in the format departmentname.branch@bank)
6. Phone (A contact phone number with country code)
7. ManagerID (An ID representing the manager of the department “FK”))

Ensure that the data is realistic, branches have different department types, and the emails and phone numbers follow a structured format.

DepartmentID	DepartmentName	BranchID	DepamentCapacity	Email	Phone	ManagerID
1	Teller	1	5	teller.abnub1@bank (+20)1521000000		1384
2	Customer Service	1	5	customerservice.abn (+20)1145000010		1449
3	Operation	1	4	operation.abnub3@l (+20)1376000000		148
4	Teller	2	5	teller.damanhour4@ (+20)1728000000		223
5	Customer Service	2	5	customerservice.dam (+20)1141000000		22
6	Operation	2	4	operation.damanhou (+20)1781000000		1247
7	Teller	3	5	teller.alfayrouz7@ba (+20)1075000000		1435
8	Customer Service	3	5	customerservice.alfa (+20)1441000000		869
9	Operation	3	4	operation.alfayrouz9 (+20)1918000000		1066
10	Teller	4	5	teller.zamalek10@ba (+20)1689000000		1273
11	Customer Service	4	5	customerservice.zam (+20)1222000017		836
12	Operation	4	4	operation.zamalek12 (+20)1148000000		942
13	Credit	4	5	credit.zamalek13@b (+20)1741000088		218
14	Teller	5	5	teller.dok14@bank (+20)1732000000		622
15	Customer Service	5	5	customerservice.dok (+20)1868000103		993
16	Operation	5	4	operation.dok16@t (+20)1636000078		691
17	Teller	6	5	teller.sanabo17@bar (+20)1090000001		202
18	Customer Service	6	5	customerservice.san (+20)1491000000		1135
19	Operation	6	4	operation.sanabo19( (+20)1714000000		150
20	Teller	7	5	teller.edfu20@bank (+20)1985000000		1155
21	Customer Service	7	5	customerservice.edfu (+20)1343000000		523
22	Operation	7	4	operation.edfu22@b (+20)1429000048		1391
23	Teller	8	5	teller.ibshaway23@b (+20)1092000000		1416
24	Customer Service	8	5	customerservice.ibsh (+20)1939000113		1679

**Expense table:** Generate a dataset for an Expenses table for all branches “2024”. The table should include the following columns:

1. ExpenseID (Unique identifier for each expense)
2. ExpenseType (Category of expense, e.g., Rent, Equipment, Maintenance, Utilities)
3. Amount (The expense amount in a realistic range)
4. BranchID (The branch where the expense was incurred “FK”))
5. ExpenseDate (Date of the expense in YYYY-MM-DD format)
6. InvoiceNum (A unique invoice number for the expense)
7. Vendor (The name of the supplier or company providing the service)

ExpenseID	ExpenseType	Amount	BranchID	ExpenseDate	InvoiceNum	Vendor
1	Rent	115898	1	2024-01-01	1086	Al Futtaim Properties
2	Equipment	107753	2	2024-01-31	2035	Techno Egypt
3	Maintenance	76704	3	2024-03-01	1469	Build Egypt
4	Maintenance	246862	4	2024-03-31	4512	Build Egypt
5	Maintenance	235155	5	2024-04-30	812	Orascom Construction
6	Utilities	80809	6	2024-05-30	4417	Alex Water
7	Equipment	229689	7	2024-06-29	4184	Misr Tech
8	Equipment	275698	8	2024-07-29	762	Cairo Engineering
9	Utilities	27494	9	2024-08-28	3640	Gasco Egypt
10	Utilities	117691	10	2024-09-27	2214	Egyptian Electricity
11	Equipment	183908	11	2024-10-27	967	El Sewedy Electric
12	Rent	214139	12	2024-11-26	661	Nasr City Developme
13	Rent	243432	13	2024-01-01	4015	Nasr City Developme
14	Rent	125786	14	2024-01-31	4570	SODIC Leasing
15	Rent	80414	15	2024-03-01	2207	Nasr City Developme
16	Equipment	48269	16	2024-03-31	3976	Techno Egypt
17	Maintenance	87545	17	2024-04-30	1285	Build Egypt
18	Rent	75896	18	2024-05-30	4471	Al Futtaim Properties
19	Maintenance	261080	19	2024-06-29	3747	Build Egypt
20	Maintenance	263503	20	2024-07-29	784	Build Egypt
21	Utilities	236498	21	2024-08-28	519	Alex Water
22	Rent	56924	22	2024-09-27	4221	New Cairo Properties
23	Utilities	182691	23	2024-10-27	2375	Egyptian Electricity
24	Maintenance	260406	24	2024-11-26	554	Orascom Construction

**Target table:** Generate a dataset for an Employee Target table with at least 24 records. The table should include the following columns:

1. EmployeeID (FK from employee table)
2. Year (The year for which the targets are set, ranging from 2019 to 2024)
3. LoanTarget (A numerical target representing loan-related goals)
4. AccountTarget (Number of new accounts to be opened)
5. WalletTarget (Target for digital wallets activation)
6. CardTarget (Target for issuing new cards)
7. OBTarget (Online banking target)
8. CertificateTarget (Target for selling banking certificates)

EmployeeID	Year	LoanTarget	AccountTarget	WalletTarget	CardTarget	OBTarget	CertificateTarget
844	2019	17465856	11	36	93	28	64
1067	2020	8821050	23	20	142	25	33
1661	2021	15401769	37	36	122	21	68
269	2022	13840054	22	18	59	30	58
1688	2023	22282415	12	30	117	35	56
1030	2024	21683494	21	38	136	12	30
264	2019	5638391	18	13	129	13	52
306	2020	13870531	31	37	64	14	34
123	2021	21116030	32	37	113	23	37
535	2022	11159240	15	27	115	25	41
1549	2023	25025816	31	36	89	13	34
1228	2024	13339885	38	27	107	18	73
1160	2019	3187983	16	35	65	24	33
1095	2020	12079879	16	33	73	15	57
1210	2021	21549801	26	34	101	24	85
728	2022	15077691	13	14	140	28	76
1238	2023	15375354	21	14	74	18	36
563	2024	20136982	25	36	149	17	57
282	2019	5257574	16	39	114	10	58
1201	2020	29421895	22	28	89	15	61
1377	2021	27417791	21	22	126	35	67
1063	2022	27140162	12	17	109	32	69
335	2023	14972795	20	20	129	21	97
1673	2024	19025710	16	37	93	12	54

**Employee table:** Generate a dataset for an Employee Information table with at least 20 records. The table should include the following columns:

1. EmployeeID (Unique identifier for each employee)
2. EmployeeNum (A unique employee number)
3. Name (Full name of the employee)
4. Position (Job title, e.g., Banker A, Supervisor, Department Manager)
5. Salary (Numerical salary value)
6. Gender (Male/Female)
7. Gov (Governorate where the employee is located, e.g., Cairo, Giza, Alexandria)
8. City (City within the governorate)
9. Address (Full address of the employee)
10. DOB (Date of Birth in MM/DD/YYYY format)
11. HireDate (Date the employee was hired)
12. BranchID (The ID of the branch where the employee works “FK”)
13. DepartmentID (The ID of the department where the employee works “FK”))
14. PerformanceScore (Numerical performance rating)
15. Status (Active, Inactive, Terminated)

EmployeeID	EmployeeNum	Name	Position	Salary	Gender	Gov	City	Address	DOB	HireDate	BranchID	DepartmentID	PerformanceScore	Status
1	770487	Reda El-Badry	Department manager	30661.42	Male	Cairo	The 5th Settlement	433 Jil Springs New Robertson, CO	11/8/1986	5/31/2023 0:00	88	297	68	Active
2	216739	Mawia Hasan	Banker A	12745.42	Female	Gaibulya	Kaf Shulta	386 Shane Harbor Port Lindeslyster, M	12/1/1994	8/5/2024 0:00	59	200	71	Inactive
3	126225	Yasmin Shaaban	Department manager	36589.77	Female	Giza	Qus	16155 Roman Street New Kellyville, OR 97	1/27/1983	8/6/2017 0:00	12	38	67	Active
4	877572	Tamer Abdelfattah	Banker B	8981.71	Male	Axut	Dainut	341 14th Avenue High Shaverstad, GA 4902	11/4/2000	4/6/2023 0:00	97	331	85	Active
5	388389	Sara Mohamed	Branch manager	47134.21	Female	Giza	Sheikh Zayed	192 Frank Light Suite East Lydihamouth, MI	8/29/1983	12/24/2024 0:00	29	99	65	Active
6	356787	Noha El-Baky	Banker B	10470.16	Female	Suez	El Garaney	76724 John Points S Coxberg, NY 1000	7/27/1995	8/1/2006 0:00	50	170	68	Active
7	334053	Ihab El-Shennawy	Banker B	8913.61	Male	Axwan	New Tushla	22391 James Mount Tashan, TX 9496	10/23/2002	8/26/2021 0:00	18	59	81	Active
8	246316	Tahany Hamid	Banker B	9200.5	Female	Port Said	Al Dawahy	514 Moon Alley Suite Port Colleenhaven, F	1/17/2000	7/22/2020 0:00	96	328	84	Active
9	872246	Nadine Farouk	Banker B	11482.96	Female	Suez	Suez City	809 Burns Creek Natahapa, IA 0805	5/20/1994	10/3/2017 0:00	76	259	95	Active
10	207473	Rania Omar	Banker A	13661.81	Female	Alexandria	Borg El-Arab	71822 Amyo Express Alturas, CA 10 71	3/16/1996	3/24/2024 0:00	77	262	84	Active
11	809570	Ibrahim Shaaban	Banker B	8027.23	Male	Port Said	Al Dawahy	465 Lam Mission East Jeffreymouth, A	2/12/1995	4/3/2019 0:00	96	330	85	Active
12	876646	Abeer Zuhdi	Supervisor	20701.2	Female	Red Sea	Safaga	10310 Jones Freewa Elizabethborough, N	8/29/1993	5/25/2015 0:00	10	32	78	Inactive
13	671858	Yasmin Abdel-Latif	Banker B	11304.07	Female	Alexandria	El Manthiyya	76311 Gomez Loop Cherrydale, VA 26	2/5/1997	9/9/2022 0:00	70	238	89	Active
14	191161	Magdy Hasan	Banker B	9936.82	Male	Axut	Sanabo	63473 Scott Well Ag Port Melindburgh, F	6/3/1995	2/1/2023 0:00	6	17	81	Active
15	719176	Ziad El-Sit	Banker B	9117.88	Male	Sohag	Saqutah	26064 Mitchell Squi North Beth, ND 0849	3/8/2000	7/30/2021 0:00	69	235	69	Active
16	542417	Hassan Saleh	Supervisor	21579.13	Male	Sohag	Saqutah	97882 Sunbeamimm Northville, TX 31	9/28/1988	1/19/2019 0:00	69	234	83	Active
17	133326	Sherif Soliman	Banker B	10493.38	Male	Damietta	Ras El Bar	909 Robert Prairie Sarsborough, TN 8	6/30/2002	11/2/2012 0:00	31	103	67	Inactive
18	131244	Dina Kassem	Banker B	10061.48	Female	Axwan	El Sebeaya	2475 Albert Road Ag Davidsted, FM 0951	6/21/2000	10/8/2005 0:00	95	324	65	Terminated
19	196246	Mahmoud Hamdy	Banker A	14978.48	Male	Axwan	El Mahamid	2784 Elizabeth Plaza North Julianberg, KY 1	10/20/1995	11/1/2006 0:00	93	318	76	Active

**Customer Segment table:** Generate a dataset for a Customer Segment Table that categorizes customers based on their deposit amounts. The table should have the following columns:

1. SegmentID (Unique numerical identifier for each segment)
2. SegmentName (Category name such as Silver, Gold, Platinum, etc.)
3. MinDepositeAmount (Minimum deposit required for this segment)
4. MaxDepositeAmount (Maximum deposit allowed for this segment)

Ensure that the deposit ranges do not overlap and that they cover various levels of customers, from entry-level to high-net-worth clients. The segmentation should include at least 5 tiers (e.g., Silver, Gold, Platinum, Diamond, Black Diamond)

SegmentID	SegmentName	Min DepositeAmount	Max DepositeAmount
1	Silver	0	100000
2	Gold	100001	500000
3	Platinum	500001	1000000
4	Diamond	1000001	5000000
5	Black Diamond	500001	10000000

**Client table:** Generate a Customer Information Table for a banking system at least 5000 rows.

The table should include the following fields:

1. ID (Unique identifier for each customer)
2. Client\_no (Unique client number)
3. Name (Full name of the customer)
4. Gender (Male/Female)
5. Date\_of\_Birth (Customer's birthdate in MM/DD/YYYY format)
6. Gov (Governorate where the customer resides)
7. City (City where the customer lives)
8. Address (Street address of the customer)
9. Phone (Customer's phone number)
10. Email (Customer's email address)
11. Registration\_Date (Date when the customer registered with the bank)
12. Segment\_ID (Reference to the customer segment classification "FK")
13. Branch\_ID (ID of the branch where the customer is registered FK")

ID	Client_no	Name	Gender	Date_of_Birth	Gov	City	Address	Phone	Email	Registration_Date	Segment_ID	Branch_ID
1	9838178336	Mariam Tarek Amr	Female	05/06/1993	Suez	Suez Port	22 Suez Port Street,	1110159967	mariam.tarek@example.com	02/02/2003	4	38
2	3317110055	Hassan Mahmoud Ht Male	Male	07/25/1935	Alexandria	Sidi Gaber	9 Sidi Gaber Street,	1256891609	hassan.mahmoud@exampl	08/23/2014	1	69
3	1745541803	Hassan Tarek Mostaf	Male	08/19/1992	Tanta	Kafr El-Zayat	5 Kafr El-Zayat Street	1379138786	hassan.tarek@example.com	10/09/2010	1	5
4	6970304333	Mohamed Amr Ibrahim	Male	12/07/1963	Alexandria	Smoothia	90 Smoothia Street, A	1582773196	mohamed.amr@example.com	02/04/2018	4	38
5	7598502951	Ahmed Ibrahim Oms	Male	12/07/2004	Alexandria	Sidi Gaber	41 Sidi Gaber Street	1293200727	ahmed.ibrahim@exa	07/11/2011	1	75
6	8640446147	Hassan Ibrahim Amr	Male	03/10/1954	Aswan	Edu	62 Edu Street, Aswan	1144328095	hassan.ibrahim@exampl	04/27/2015	1	96
7	6824920802	Ahmed Mostafa Mos	Male	09/09/1995	Tanta	Kafr El-Zayat	26 Kafr El-Zayat Street	1165488284	ahmed.mostafa@exampl	07/18/2011	1	15
8	2599849003	Hala Mostafa Omar	Female	09/01/1987	Suez	Arbaeen	7 Arbaeen Street, St	1706733700	hala.mostafa@example.com	10/30/2013	2	79
9	1087487962	Ahmed Tarek Tarek	Male	09/03/1998	Suez	Suez Port	25 Suez Port Street,	1485665052	ahmed.tarek@example.com	07/20/2024	1	21
10	5409994137	Nour Mostafa Mahm	Female	12/22/1992	Tanta	Kafr El-Zayat	47 Kafr El-Zayat Street	1249224003	nour.mostafa@example.com	10/05/2016	3	45
11	2554191707	Mariam Hassan Hass	Female	10/16/1997	Suez	Arbaeen	16 Arbaeen Street, S	1185083803	mariam.hassan@example.com	10/01/2000	1	33
12	4542110506	Mariam Ibrahim Tarek	Female	12/14/1955	Zagazig	Abu Hammad	2 Abu Hammad Street	1504746922	mariam.ibrahim@exampl	10/04/2012	3	3
13	6735171819	Mohamed Omar Ibra	Male	12/04/1979	Zagazig	Abu Hammad	54 Abu Hammad Street	1648540431	mohamed.omar@example.com	07/20/2016	1	54
14	3888306606	All Omar Mahmoud	Male	03/06/1940	Suez	Suez Port	63 Suez Port Street,	1552567834	all.omar@example.c	04/13/2002	3	30
15	6630852078	Omar Mostafa Hassi	Male	02/14/1973	Luxor	West Bank	46 West Bank Street,	1764087593	omar.mostafa@example.com	08/18/2008	4	1
16	3706973365	All Ibrahim Omar	Male	01/24/1950	Tanta	Kafr El-Zayat	24 Kafr El-Zayat Street	1252786009	all.ibrahim@example.com	11/25/2016	1	12
17	2417168216	Sara Ibrahim Hassan	Female	02/21/1991	Alexandria	Sidi Gaber	90 Sidi Gaber Street	1207829394	sara.ibrahim@example.com	08/30/2010	2	82
18	1127678778	Fatma Amr Amr	Female	12/06/1945	Luxor	East Bank	1 East Bank Street, L	1230192866	fatma.amr@example.com	05/17/2003	3	42
19	7787729762	Mariam Hassan Tare	Female	05/07/1943	Cairo	Maadi	47 Maadi Street, Cai	1630335267	mariam.hassan@example.com	05/01/2020	1	8
20	8852235271	Sara Omar Tarek	Female	03/13/1938	Suez	Arbaeen	76 Arbaeen Street, S	1202564865	sara.omar@example.com	01/25/2021	1	58
21	3293269430	Mohamed Malmouci	Male	03/22/1966	Luxor	East Bank	89 East Bank Street,	1952315017	mohamed.malmouci@example.com	10/04/2009	2	72
22	4022748094	Mariam Omar Mahm	Female	05/08/1945	Tanta	El-Mahalla	77 El-Mahalla Street	1679056309	mariam.omar@example.com	07/22/2016	3	62
23	4100593402	Mohamed Hassan Tz	Male	02/08/1986	Tanta	El-Mahalla	77 El-Mahalla Street	1543243872	mohamed.hassan@example.com	01/26/2007	2	41
24	6787725413	Hala Amr Hassan	Female	01/06/2007	Luxor	East Bank	6 East Bank Street, L	1059078724	hala.amr@example.com	04/05/2005	1	85

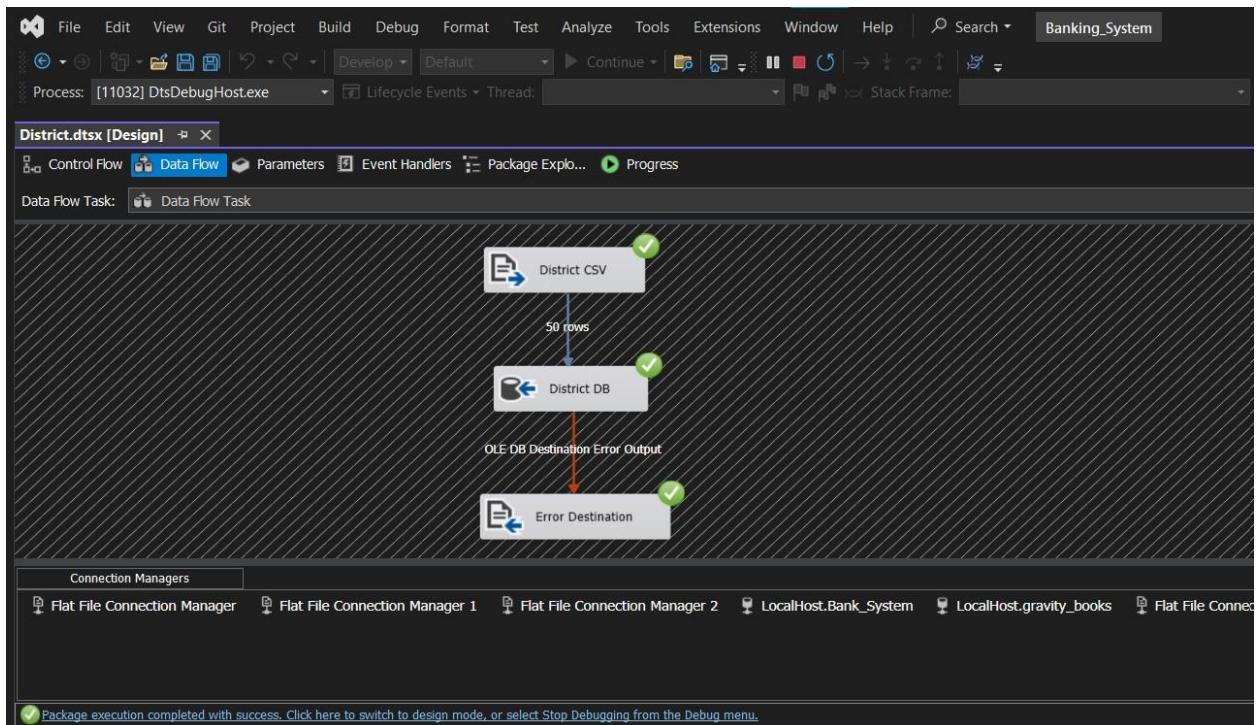
**ATM table:** Generate an ATM Information Table for a banking system. The table should include the following fields:

1. ATMID (Unique identifier for each ATM)
2. ATMNum (Unique ATM number)
3. BranchID (ID of the branch where the ATM is located “FK”)
4. CashCapacity (Maximum cash holding capacity of the ATM)
5. InstallationDate (Date when the ATM was installed in YYYY-MM-DD format)
6. LastMaintenance (Last maintenance date in YYYY-MM-DD format)
7. Status (ATM status: Active or Inactive)

ATMID	ATMNum	BranchID	CashCapacity	InstallationDate	LastMaintenance	Status
1	1839	20	500000	2001-08-23	2001-09-22	Inactive
2	7147	51	550000	2018-04-08	2018-05-08	Active
3	7778	5	600000	2009-02-28	2009-03-30	Active
4	4262	91	650000	2024-08-03	2024-09-02	Active
5	1904	39	700000	2023-03-11	2023-04-10	Active
6	6884	14	750000	2014-08-19	2014-09-18	Active
7	7390	14	800000	2014-06-14	2014-07-14	Active
8	5960	4	850000	2024-03-14	2024-04-13	Active
9	9242	59	900000	2022-09-22	2022-10-22	Active
10	2990	9	950000	2019-08-17	2019-09-16	Active
11	9457	38	1000000	2024-01-27	2024-02-26	Inactive
12	7026	81	1050000	2023-03-04	2023-04-03	Active
13	6180	89	1100000	2015-08-08	2015-09-07	Active
14	1879	83	1150000	2023-09-22	2023-10-22	Active
15	8519	20	1200000	2001-02-20	2001-03-22	Active
16	9933	31	1250000	2007-09-13	2007-10-13	Active
17	3821	32	1300000	2013-05-31	2013-06-30	Active
18	8088	72	1350000	2001-08-05	2001-09-04	Active
19	4385	6	1400000	2021-07-13	2021-08-12	Active
20	4326	14	1450000	2014-04-22	2014-05-22	Active
21	1463	25	1500000	2024-12-28	2025-01-27	Active
22	9379	69	1550000	2015-03-06	2015-04-05	Active
23	8627	61	1600000	2002-10-03	2002-11-02	Inactive
24	7294	61	1650000	2002-10-19	2002-11-18	Active

## Seamless Data Integration with SSIS: ETL Implementation

SQL Server Integration Services (SSIS) was used to efficiently integrate CSV files into SQL Server Management Studio (SSMS). The process involved creating an SSIS package that extracts data from the CSV file, transforms it if needed, and loads it into the corresponding SQL Server tables. Data cleansing and validation steps were applied to ensure accuracy and consistency. SSIS Data Flow tasks facilitated smooth data transfer while handling errors and duplicates effectively. Connection managers were configured to establish seamless links between the source CSV and SQL database. Automated scheduling was set up to streamline periodic data imports. This integration improved data accessibility and accuracy for further analysis and reporting.



## Stored Procedures

Stored procedures play a crucial role in database management by ensuring data consistency, security, and efficiency. Here is a sample of the stored procedures.

### **Insert Procedure: Adds a new District with a unique ID.**

```
CREATE PROCEDURE InsertDistrict
    @DistrictNumber INT,
    @Region VARCHAR(30)

AS

BEGIN
    DECLARE @NewDistrictID INT;

    -- Get the last DistrictID and increment it
    SELECT @NewDistrictID = ISNULL(MAX(DistrictID), 0) + 1 FROM District;

    INSERT INTO District (DistrictID, DistrictNumber, Region, CreatedDate)
    VALUES (@NewDistrictID, @DistrictNumber, @Region, GETDATE());

END;
GO
```

### **Update Procedure: Modifies details of an existing District.**

```
CREATE PROCEDURE UpdateDistrict
    @DistrictID INT,
    @DistrictNumber INT,
    @Region VARCHAR(30)

AS

BEGIN
```

```
UPDATE District  
SET DistrictNumber = @DistrictNumber,  
    Region = @Region  
WHERE DistrictID = @DistrictID;  
END;  
GO
```

#### **Delete Procedure: Removes a District and handles branch reassignment.**

```
CREATE PROCEDURE DeleteDistrict  
    @DistrictID INT,  
    @NewDistrictID INT = NULL -- If provided, move branches; otherwise, remove relation  
AS  
BEGIN  
    IF EXISTS (SELECT 1 FROM Branch WHERE DistrictID = @DistrictID)  
        BEGIN  
            IF @NewDistrictID IS NOT NULL  
                BEGIN  
                    -- Move branches to another district  
                    UPDATE Branch SET DistrictID = @NewDistrictID WHERE DistrictID = @DistrictID;  
                END  
            ELSE  
                BEGIN  
                    -- Remove the relation between branches and this district  
                    UPDATE Branch SET DistrictID = NULL WHERE DistrictID = @DistrictID;  
                END  
        END  
    -- Delete the district after handling branches
```

```
DELETE FROM District WHERE DistrictID = @DistrictID;  
END;
```

```
GO
```

**Select Procedure: Retrieve all or a specific District.**

```
ALTER PROCEDURE SelectDistrict
```

```
    @DistrictNumber INT,  
    @Region VARCHAR(30)
```

```
AS
```

```
BEGIN
```

```
    -- If NULL, returns all districts
```

```
    IF @DistrictNumber IS NULL OR @Region IS NULL
```

```
        SELECT * FROM District;
```

```
    ELSE
```

```
        SELECT * FROM District WHERE DistrictNumber = @DistrictNumber AND Region =  
        @Region;
```

```
END;
```

```
GO
```

**Insert Procedure: Adds a new Branch and assigns a Manager.**

```
CREATE PROCEDURE InsertBranch
```

```
    @BranchName VARCHAR(30),  
    @BranchType VARCHAR(10),  
    @DistrictID INT,  
    @OpeningDate DATETIME,  
    @ManagerName VARCHAR(100),  
    @EmployeeNum INT
```

```
AS
```

```

BEGIN

DECLARE @NewBranchID INT;
DECLARE @ManagerID INT;
DECLARE @CurrentPosition VARCHAR(50);

-- Get the last BranchID and increment it
SELECT @NewBranchID = ISNULL(MAX(BranchID), 0) + 1 FROM Branch;

-- Retrieve the ManagerID and Position using ManagerName
SELECT @ManagerID = EmployeeID, @CurrentPosition = Position
FROM Employee
WHERE Name = @ManagerName AND EmployeeNum = @EmployeeNum;

-- Ensure the Manager exists
IF @ManagerID IS NULL
BEGIN
    PRINT 'Error: Manager not found!';
    RETURN;
END

-- If the employee is not a Manager, update their position
IF @CurrentPosition <> 'Manager'
BEGIN
    UPDATE Employee
    SET Position = 'Manager'
    WHERE EmployeeID = @ManagerID;
END

```

```
-- Insert the new branch

INSERT INTO Branch (BranchID, BranchName, BranchType, DistrictID, OpeningDate,
ManagerID)

VALUES (@NewBranchID, @BranchName, @BranchType, @DistrictID, @OpeningDate,
@ManagerID);

END;

GO
```

#### **Update Procedure: Updates a Branch's Manager and District.**

```
CREATE PROCEDURE UpdateBranch

@BranchName VARCHAR(100),

@NewManagerName VARCHAR(100),

@NewDistrictID INT

AS

BEGIN

DECLARE @NewManagerID INT;

-- Get the new Manager ID

SELECT @NewManagerID = EmployeeID FROM Employee WHERE Name =
@NewManagerName;

-- Ensure the Manager exists

IF @NewManagerID IS NULL

BEGIN

PRINT 'Error: New Manager not found!';

RETURN;

END
```

```
-- Update the branch with the new Manager and District  
UPDATE Branch  
SET ManagerID = @NewManagerID, DistrictID = @NewDistrictID  
WHERE BranchName = @BranchName;  
END;  
GO
```

**Delete Procedure: Removes a Branch if no dependencies exist.**

```
CREATE PROCEDURE DeleteBranch  
    @BranchName VARCHAR(30),  
    @DistrictName VARCHAR(50)  
AS  
BEGIN  
    DECLARE @BranchID INT, @DistrictID INT;  
  
    -- Get the DistrictID  
    SELECT @DistrictID = DistrictID FROM District WHERE DistrictName = @DistrictName;  
  
    -- Get the BranchID  
    SELECT @BranchID = BranchID FROM Branch WHERE BranchName = @BranchName AND  
    DistrictID = @DistrictID;  
  
    -- Ensure the branch exists  
    IF @BranchID IS NULL  
    BEGIN  
        PRINT 'Error: Branch not found!';
```

```

    RETURN;

END

-- Check if the branch has any employees
IF EXISTS (SELECT 1 FROM Employee WHERE BranchID = @BranchID)
BEGIN
    PRINT 'Error: Cannot delete branch. Employees exist!';
    RETURN;
END

-- Check if the branch has any departments
IF EXISTS (SELECT 1 FROM Department WHERE BranchID = @BranchID)
BEGIN
    PRINT 'Error: Cannot delete branch. Departments exist!';
    RETURN;
END

-- If no dependencies, delete the branch
DELETE FROM Branch WHERE BranchID = @BranchID;

PRINT 'Branch deleted successfully.';

END;
GO

```

**Select Procedure: Retrieves details of a specific Branch.**

```

CREATE PROCEDURE GetBranchDetails
    @Branchname VARCHAR(100)

```

```
AS
BEGIN
    SELECT
        B.BranchName,
        B.BranchType,
        D.DistrictID,
        E.Name AS ManagerName,
        E.Position AS ManagerPosition
    FROM Branch B
    LEFT JOIN District D ON B.DistrictID = D.DistrictID
    LEFT JOIN Employee E ON B.ManagerID = E.EmployeeID
    WHERE B.Branchname = @Branchname;
END;
GO
```

#### **Insert Procedure: Adds a new Department in a Branch.**

```
CREATE PROCEDURE InsertDepartment
    @DepartmentName VARCHAR(200),
    @BranchName VARCHAR(30),
    @ManagerName VARCHAR(100) = NULL, -- Manager is optional
    @DepartmentCapacity INT = NULL,
    @Email VARCHAR(200) = NULL,
    @Phone VARCHAR(20) = NULL
AS
BEGIN
    DECLARE @BranchID INT, @ManagerID INT;
```

```
-- Get BranchID

SELECT @BranchID = BranchID FROM Branch WHERE BranchName = @BranchName;

IF @BranchID IS NULL
BEGIN
    PRINT 'Error: Branch not found!';
    RETURN;
END

-- If ManagerName is provided, get ManagerID

IF @ManagerName IS NOT NULL
BEGIN
    SELECT @ManagerID = EmployeeID FROM Employee WHERE Name = @ManagerName AND
BranchID = @BranchID;

    IF @ManagerID IS NULL
    BEGIN
        PRINT 'Error: Manager not found in this branch!';
        RETURN;
    END
    END

-- Insert department

INSERT INTO Department (DepartmentName, BranchID, ManagerID, DepartmentCapacity,
Email, Phone)
VALUES (@DepartmentName, @BranchID, @ManagerID, @DepartmentCapacity, @Email,
@Phone);
```

```
PRINT 'Department added successfully.';  
END;  
GO
```

### **Update Procedure: Modifies details of a Department.**

```
CREATE PROCEDURE UpdateDepartment  
    @DepartmentName VARCHAR(200),  
    @BranchName VARCHAR(30),  
    @NewManagerName VARCHAR(100) = NULL,  
    @NewCapacity INT = NULL,  
    @NewEmail VARCHAR(200) = NULL,  
    @NewPhone VARCHAR(20) = NULL  
AS  
BEGIN  
    DECLARE @BranchID INT, @DepartmentID INT, @NewManagerID INT;  
  
    -- Get BranchID  
    SELECT @BranchID = BranchID FROM Branch WHERE BranchName = @BranchName;  
  
    -- Get DepartmentID  
    SELECT @DepartmentID = DepartmentID FROM Department WHERE DepartmentName =  
        @DepartmentName AND BranchID = @BranchID;  
  
    IF @DepartmentID IS NULL  
    BEGIN
```

```
PRINT 'Error: Department not found!';

RETURN;

END

-- If ManagerName is provided, get ManagerID

IF @NewManagerName IS NOT NULL

BEGIN

    SELECT @NewManagerID = EmployeeID FROM Employee WHERE Name =
@NewManagerName AND BranchID = @BranchID;

IF @NewManagerID IS NULL

BEGIN

    PRINT 'Error: New manager not found in this branch!';

    RETURN;

END

END

-- Update Department

UPDATE Department

SET

    ManagerID = COALESCE(@NewManagerID, ManagerID),
    DepartmentCapacity = COALESCE(@NewCapacity, DepartmentCapacity),
    Email = COALESCE(@NewEmail, Email),
    Phone = COALESCE(@NewPhone, Phone)

WHERE DepartmentID = @DepartmentID;

PRINT 'Department updated successfully.';
```

```
END;  
GO
```

#### **Delete Procedure: Removes a Department if no employees exist.**

```
CREATE PROCEDURE DeleteDepartment  
    @DepartmentName VARCHAR(200),  
    @BranchName VARCHAR(30)  
AS  
BEGIN  
    DECLARE @BranchID INT, @DepartmentID INT;  
  
    -- Get BranchID  
    SELECT @BranchID = BranchID FROM Branch WHERE BranchName = @BranchName;  
  
    -- Get DepartmentID  
    SELECT @DepartmentID = DepartmentID FROM Department WHERE DepartmentName =  
        @DepartmentName AND BranchID = @BranchID;  
  
    IF @DepartmentID IS NULL  
    BEGIN  
        PRINT 'Error: Department not found!';
```

```

    RETURN;

END

-- Check if department has employees

IF EXISTS (SELECT 1 FROM Employee WHERE DepartmentID = @DepartmentID)
BEGIN
    PRINT 'Error: Cannot delete department. Employees exist!';
    RETURN;
END

-- Delete Department

DELETE FROM Department WHERE DepartmentID = @DepartmentID;

PRINT 'Department deleted successfully.';

END;
GO

```

**-Retrieve details of a specific department.**

```

CREATE PROCEDURE GetDepartment
    @DepartmentName VARCHAR(200),
    @BranchName VARCHAR(30)

AS
BEGIN
    DECLARE @BranchID INT, @DepartmentID INT;

    -- Get BranchID

    SELECT @BranchID = BranchID FROM Branch WHERE BranchName = @BranchName;

```

```

-- Get DepartmentID

SELECT @DepartmentID = DepartmentID FROM Department WHERE DepartmentName =
@DepartmentName AND BranchID = @BranchID;

IF @DepartmentID IS NULL
BEGIN
    PRINT 'Error: Department not found!';
    RETURN;
END

-- Get Department Details

SELECT
    d.DepartmentName,
    b.BranchName,
    e.Name AS ManagerName,
    d.DepartmentCapacity,
    d.Email,
    d.Phone
FROM Department d
JOIN Branch b ON d.BranchID = b.BranchID
LEFT JOIN Employee e ON d.ManagerID = e.EmployeeID
WHERE d.DepartmentID = @DepartmentID;

END;
GO

```

**Insert a new employee into a department.**

```

CREATE PROCEDURE InsertEmployee
    @EmployeeNum INT,
    @Name VARCHAR(200),
    @Position VARCHAR(200),
    @Salary DECIMAL(10,2),
    @Gender VARCHAR(10),
    @Gov VARCHAR(20) = NULL,
    @City VARCHAR(30) = NULL,
    @Address VARCHAR(80),
    @DOB DATE,
    @HireDate DATETIME,
    @BranchName VARCHAR(30),
    @DepartmentName VARCHAR(200),
    @PerformanceScore INT = NULL,
    @Status VARCHAR(15)

AS
BEGIN
    DECLARE @BranchID INT, @DepartmentID INT;

    -- Check if EmployeeNum is 6 digits
    IF @EmployeeNum < 100000 OR @EmployeeNum > 999999
        BEGIN
            PRINT 'Error: EmployeeNum must be a 6-digit number!';
            RETURN;
        END

    -- Get BranchID

```

```

SELECT @BranchID = BranchID FROM Branch WHERE BranchName = @BranchName;

IF @BranchID IS NULL
BEGIN
    PRINT 'Error: Branch not found!';
    RETURN;
END

-- Get DepartmentID
SELECT @DepartmentID = DepartmentID FROM Department WHERE DepartmentName =
@DepartmentName AND BranchID = @BranchID;

IF @DepartmentID IS NULL
BEGIN
    PRINT 'Error: Department not found in this branch!';
    RETURN;
END

-- Insert Employee
INSERT INTO Employee (EmployeeNum, Name, Position, Salary, Gender, Gov, City, Address,
DOB, HireDate, BranchID, DepartmentID, PerformanceScore, Status)
VALUES (@EmployeeNum, @Name, @Position, @Salary, @Gender, @Gov, @City, @Address,
@DOB, @HireDate, @BranchID, @DepartmentID, @PerformanceScore, @Status);

PRINT 'Employee added successfully.';

END;
GO

```

### **Update an employee's details, including transfer.**

```
CREATE PROCEDURE UpdateEmployee
```

```

@EmployeeNum INT,
@NewPosition VARCHAR(200) = NULL,
@NewSalary DECIMAL(10,2) = NULL,
@NewPerformanceScore INT = NULL,
@NewStatus VARCHAR(15) = NULL,
@NewBranchName VARCHAR(30) = NULL,
@NewDepartmentName VARCHAR(200) = NULL

AS

BEGIN

DECLARE @EmployeeID INT, @NewBranchID INT, @NewDepartmentID INT;

-- Get EmployeeID

SELECT @EmployeeID = EmployeeID FROM Employee WHERE EmployeeNum =
@EmployeeNum;

IF @EmployeeID IS NULL

BEGIN

PRINT 'Error: Employee not found!';

RETURN;

END

-- Get New BranchID if provided

IF @NewBranchName IS NOT NULL

BEGIN

SELECT @NewBranchID = BranchID FROM Branch WHERE BranchName =
@NewBranchName;

IF @NewBranchID IS NULL

BEGIN

PRINT 'Error: New branch not found!';

```

```

    RETURN;

    END

    END

-- Get New DepartmentID if provided

IF @NewDepartmentName IS NOT NULL

BEGIN

    -- If no new branch was provided, use the employee's current branch

    IF @NewBranchID IS NULL

        BEGIN

            SELECT @NewBranchID = BranchID FROM Employee WHERE EmployeeID =
@EmployeeID;

        END

    SELECT @NewDepartmentID = DepartmentID FROM Department WHERE DepartmentName
= @NewDepartmentName AND BranchID = @NewBranchID;

    IF @NewDepartmentID IS NULL

        BEGIN

            PRINT 'Error: New department not found in the specified branch!';

            RETURN;

        END

    END

-- Update Employee

UPDATE Employee

SET

Position = COALESCE(@NewPosition, Position),

```

```
Salary = COALESCE(@NewSalary, Salary),  
PerformanceScore = COALESCE(@NewPerformanceScore, PerformanceScore),  
Status = COALESCE(@NewStatus, Status),  
BranchID = COALESCE(@NewBranchID, BranchID),  
DepartmentID = COALESCE(@NewDepartmentID, DepartmentID)  
WHERE EmployeeID = @EmployeeID;
```

```
PRINT 'Employee updated successfully.';
```

```
END;
```

```
GO
```

## Data-Driven Insights: Report Extraction with SSRS

Generating and visualizing data insights from the banking system database. SQL Server Reporting Services (SSRS) enables the creation of dynamic, interactive reports with features like charts, tables, and drill-downs. By connecting to the database, SSRS retrieves real-time data for customer transactions, account summaries, and financial performance. These reports help in decision-making, auditing, and regulatory compliance within the banking system.

[https://drive.google.com/drive/folders/10-F3z550gmBUeO5t8yt\\_s4GeXrttHa0N](https://drive.google.com/drive/folders/10-F3z550gmBUeO5t8yt_s4GeXrttHa0N)

### -Samples of the extracted Reports:

**Branch report:** provides essential details about a specific bank branch, including its name, type, district ID, manager, and opening date. This report is designed to help bank administrators, auditors, and decision-makers track branch operations, monitor branch managers, and analyze branch distribution.



### Branch Report

Branch Name	Branch Type	District ID	Manager Name	Opening Date
Dokki	Retail	38	Essam Yousef	3/19/2008 12:00:00 AM

**ATM report:** provides an overview of the bank's ATMs, including their ID, branch association, cash capacity, installation date, last maintenance date, and operational status. This report helps bank administrators and maintenance teams track ATM performance, monitor cash availability, schedule maintenance, and identify inactive ATMs.



## ATM Report

ATMID	Branch ID	Cash Capacity	Installation Date	Last Maintenance	Status	ATMNum
1	20	500000	8/23/2001 12:00:00 AM	9/22/2001 12:00:00 AM	Inactive	1839
2	51	550000	4/8/2018 12:00:00 AM	5/8/2018 12:00:00 AM	Active	7147
3	5	600000	2/28/2009 12:00:00 AM	3/30/2009 12:00:00 AM	Active	7778
4	91	650000	8/3/2024 12:00:00 AM	9/2/2024 12:00:00 AM	Active	4262
5	39	700000	3/11/2023 12:00:00 AM	4/10/2023 12:00:00 AM	Active	1904
6	14	750000	8/19/2014 12:00:00 AM	9/18/2014 12:00:00 AM	Active	6884
7	14	800000	6/14/2014 12:00:00 AM	7/14/2014 12:00:00 AM	Active	7390
8	4	850000	3/14/2024 12:00:00 AM	4/13/2024 12:00:00 AM	Active	5960
9	59	900000	9/22/2022 12:00:00 AM	10/22/2022 12:00:00 AM	Active	9242
10	9	950000	8/17/2019 12:00:00 AM	9/16/2019 12:00:00 AM	Active	2990
11	38	1000000	1/27/2024 12:00:00 AM	2/26/2024 12:00:00 AM	Inactive	9457
12	81	1050000	3/4/2023 12:00:00 AM	4/3/2023 12:00:00 AM	Active	7026
13	89	1100000	8/8/2015 12:00:00 AM	9/7/2015 12:00:00 AM	Active	6180
14	83	1150000	9/22/2023 12:00:00 AM	10/22/2023 12:00:00 AM	Active	1879
15	20	1200000	2/20/2001 12:00:00 AM	3/22/2001 12:00:00 AM	Active	8519
16	31	1250000	9/13/2007 12:00:00 AM	10/13/2007 12:00:00 AM	Active	9933

**Client report:** provides detailed information about bank clients, including their Client Number, Name, Gender, Date of Birth, Contact Details, Address, and Registered Branch. This report helps customer service and management teams track client demographics, segment customers based on banking services, and analyze client distribution across branches.



### Client Report

Client Num	Name	Gender	DOB	Gov	City	Address	Phone	Email	Segment Name	Branch Name	Registration Date
1745541803	Hassan Tarek Mostafa	Male	8/19/1992 12:00:00 AM	Tanta	Kafr El-Zayat	5 Kafr El-Zayat Street, Tanta	1379138786	hassan.tarek@example.com	Silver	Dokki	10/9/2010 12:00:00 AM

**District report:** provides key details about banking districts, including the District ID, District Number, Region, and Creation Date. This report helps bank administrators and analysts track district-wise branch distribution, monitor regional banking performance, and support strategic expansion decisions.



### District Report

District ID	District Number	Region	Created Date
2	1	Assiut	1/8/2013 12:00:00 AM

**Employee report:** provides comprehensive details about bank employees, including Employee Number, Name, Position, Salary, Address, Department, Hire Date, and Performance Score. This report helps HR and management teams track employee records, monitor performance, analyze salary distribution, and ensure workforce efficiency.



### Employee Report

Employee Num	Name	Position	Salary	Gender	Gov	City	Address	DOB	Hire Date	Branch Name	Department Name	Performance Score	Status
704596	Ramy Tantawy	Department manager	52124.87	Male	Ismailia	Tell El Kebir	993 Randall Plain Stewartport, MP 29193	6/3/1982 12:00:00 AM	11/29/2021 12:00:00 AM	Tell El Kebir	Customer Service	73	Active

**Target report:** provides insights into employees' performance in achieving business targets across different product categories, such as Loans, Accounts, and Wallets, over multiple years. It includes achieved amounts, target amounts, and achievement percentages, enabling management to evaluate performance, set realistic goals, and identify areas for improvement.



## Employee Target Report

Year	Product Category	Achieved Amount	Target Amount	Achievement Percentage
2019	Loans	0	1159881	0%
2020	Loans	0	5503698	0%
2021	Loans	283963	1406115	20%
2022	Loans	0	6998677	0%
2023	Loans	0	7885809	0%
2019	Accounts	0	34	0%
2020	Accounts	0	15	0%
2021	Accounts	0	18	0%
2022	Accounts	0	14	0%
2023	Accounts	0	19	0%
2019	Wallets	0	23	0%
2020	Wallets	0	24	0%
2021	Wallets	0	27	0%
2022	Wallets	0	26	0%
2023	Wallets	0	27	0%

**Transaction report:** Provides a detailed overview of financial transactions processed by the bank. It includes key details such as Transaction ID, Reference Number, Client ID, Service ID, Employee ID, Amount, Transaction Date, Status, Client Name, Service Name, and Employee Name.



### Transactions Report

Transaction ID	Reference Num	Client ID	Service ID	Employee ID	Amount	Transaction Date	Status	Client Name	Service Name	Employee Name
10	1041900	10	24	1187	1516490	8/30/2024 12:00:00 AM	Pending	Nour Mostafa Mahmoud	deposit	Nora El-Sayed

## Data Modeling

Data modeling is crucial in designing an efficient banking system database as it ensures structured, well-organized data storage and retrieval. By defining clear relationships between entities such as clients, accounts, transactions, and branches, it minimizes redundancy and enhances data integrity. Normalization techniques were applied to eliminate data duplication, leading to better storage efficiency and faster query performance. The Entity-Relationship Diagram (ERD) helped visualize the system's architecture, ensuring a logical and scalable structure. Proper indexing strategies were implemented to speed up searches and reporting. Mapping the data flow allowed for seamless integration between different banking operations. Stored procedures and constraints were enforced to maintain data consistency and security. The model was optimized to support complex queries, ensuring quick and accurate insights. This well-structured data model played a key role in improving banking operations, risk management, and customer service. Ultimately, data modeling enhanced the overall performance and reliability of the banking system.



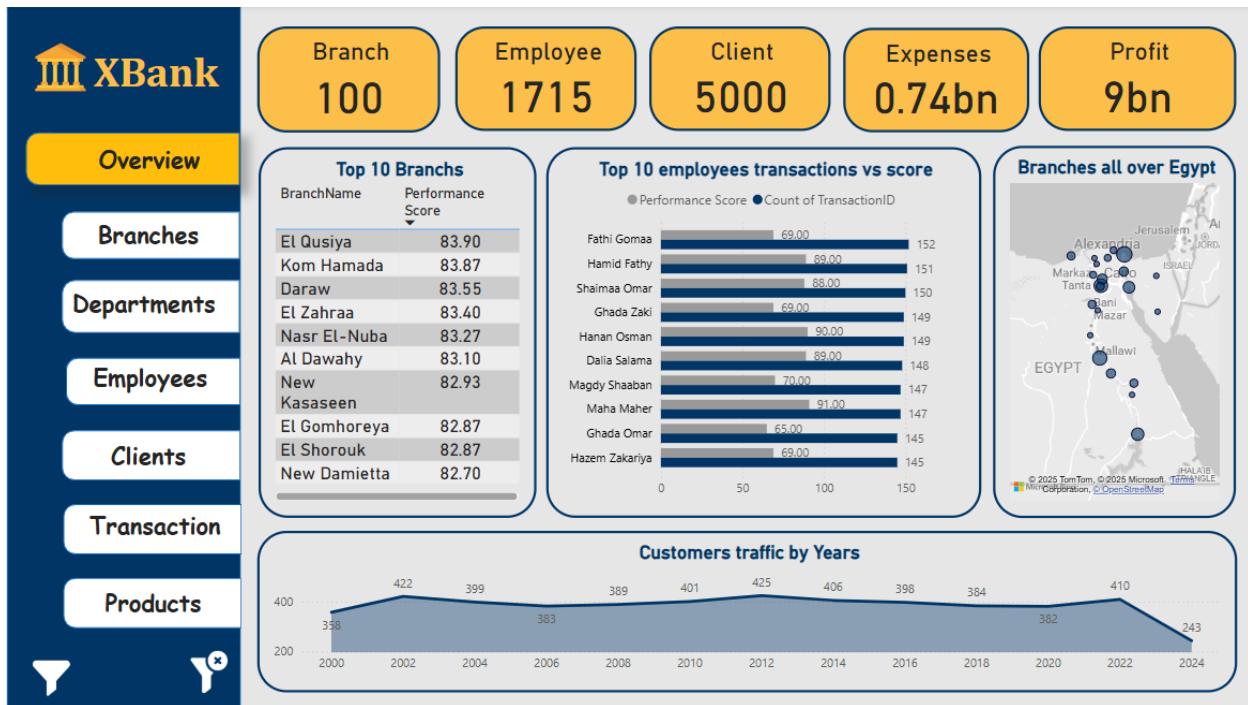
## Power BI Dashboards

Power BI is a powerful business intelligence (BI) tool developed by Microsoft, designed to transform raw data into meaningful insights through interactive dashboards and reports. It enables users to connect to various data sources, clean and model data, and create visual representations that facilitate data-driven decision-making. With its user-friendly interface, drag-and-drop functionality, and advanced analytics capabilities, Power BI allows businesses to track key performance indicators (KPIs), identify trends, and gain deeper insights into their operations. In the banking sector, Power BI plays a crucial role in analyzing financial data, monitoring customer behavior, and optimizing business processes. Its seamless integration with SQL Server and other databases ensures efficient data processing, making it an essential tool for enhancing data visibility and strategic planning.

As part of our banking system analysis, we created 20 interactive Power BI dashboards to visualize key metrics and enhance decision-making. Each dashboard provides unique insights into different aspects of banking operations:

1. **Bank Overview** – A high-level summary of overall bank performance.
2. **Branch Analysis** – Evaluates branch operations, efficiency, and performance.
3. **District Analysis** – Analyzes banking activities across different districts.
4. **ATM Performance** – Tracks ATM usage and availability
5. **Expenses Dashboard** – Monitors operational and financial expenditures.
6. **Departments Overview** – Provides insights into departmental performance.
7. **Employee Analysis** – Examines workforce distribution and productivity.
8. **Client Insights** – Analyzes customer demographics and engagement.
9. **Transactions Overview** – Displays trends in banking transactions.
10. **Services & Products** – Evaluates the performance of banking services.
11. **Products Overview** – Analyzes individual banking products and their impact.
12. **Accounts Dashboard** – Tracks different types of bank accounts and growth.
13. **Loan Performance** – Monitors loan approvals, repayments, and trends.
14. **Wallet Transactions** – Analyzes digital wallet usage and transactions.
15. **Online Banking Usage** – Tracks digital banking engagement and adoption.
16. **Certificates Analysis** – Provides insights into issued financial certificates.
17. **Cards Overview** – Details about cards types and client's usage.

## Bank Overview Dashboard



A comprehensive overview of the bank's key performance metrics, branch distribution, employee performance, and customer trends:

### 1. Top Summary Metrics

- Branch (100): Total number of active bank branches.
- Employee (1715): Total number of employees working in the bank.
- Client (5000): Total number of customers served by the bank.
- Expenses (0.74bn): Total bank expenses in billions.
- Profit (9bn): Total profit generated by the bank in billions.

### 2. Top 10 Branches

- Displays the top-performing branches ranked by performance score.
- The highest-ranked branch is El Qusiya with a score of 83.90.
- This helps in identifying well-performing locations.

### 3. Top 10 Employees – Transactions vs. Score (Middle Chart)

- A bar chart comparing employees' performance scores and their count of transactions.
- Shows which employees handle the most transactions while maintaining high performance.

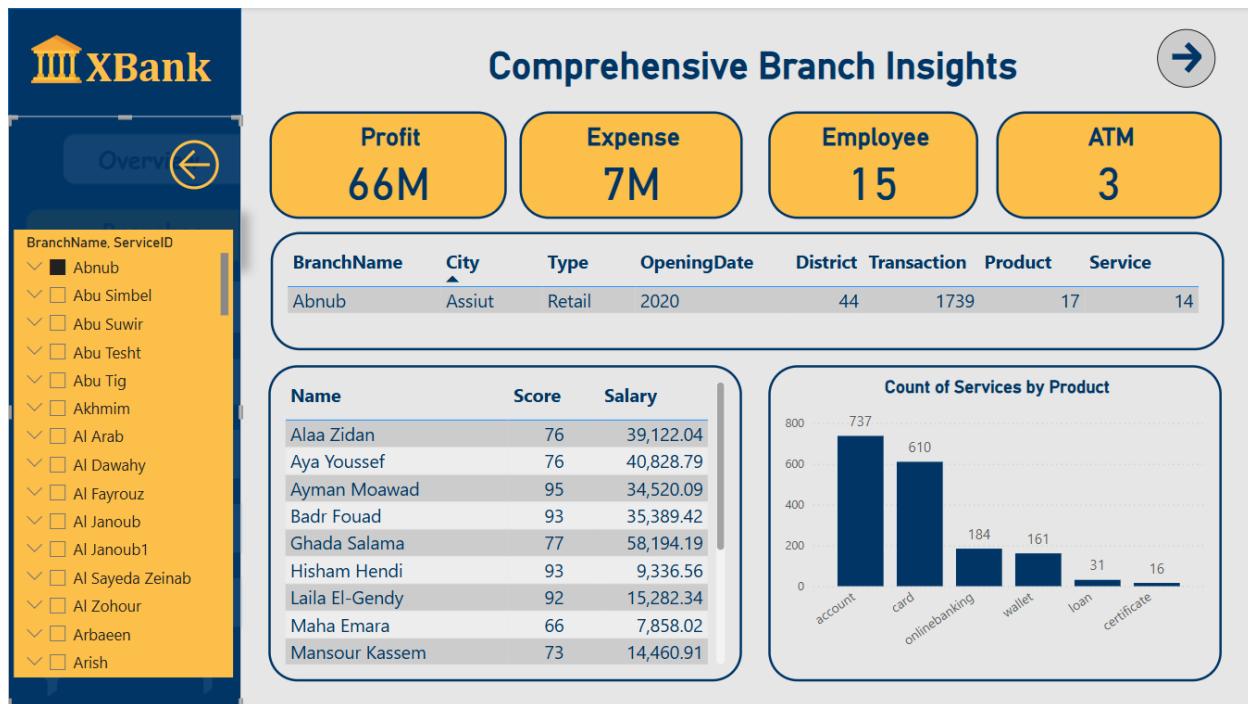
#### 4. Branches All Over Egypt

- A geographical map showing branch distribution across Egypt.
- Helps in analyzing regional coverage and identifying areas for expansion.

#### 5. Customers Traffic by Years

- Tracks the number of customers over different years (from 2000 to 2024).
- Shows fluctuations in customer engagement and trends over time.

### Branch Dashboard



Provides a detailed view of an individual bank branch's performance, including financial metrics, employee details, transactions, and service distribution:

## 1. Top Summary Metrics

- Profit (66M): Total profit generated by the selected branch in millions.
- Expense (7M): Total expenses incurred by the branch in millions.
- Employee (15): Number of employees working at the branch.
- ATM (3): Number of ATMs available at the branch.

## 2. Branch Details

- Displays detailed information about the selected branch:
  - Branch Name: The branch currently being analyzed (Abnub).
  - City: The city where the branch is located (Assiut).
  - Type: The branch category (Retail).
  - Opening Date: The year the branch was established (2020).
  - District: The assigned district number (44).
  - Transaction: Total number of transactions handled by the branch (1739).
  - Product: Number of different financial products offered (17).
  - Service: Number of different services provided by the branch (14).

## 3. Employee Performance & Salaries

- Lists employees working at the branch along with:
  - Performance Score: Evaluates employee performance.
  - Salary: Displays employee salaries, helping in salary benchmarking and HR decisions.

## 4. Count of Services by Product

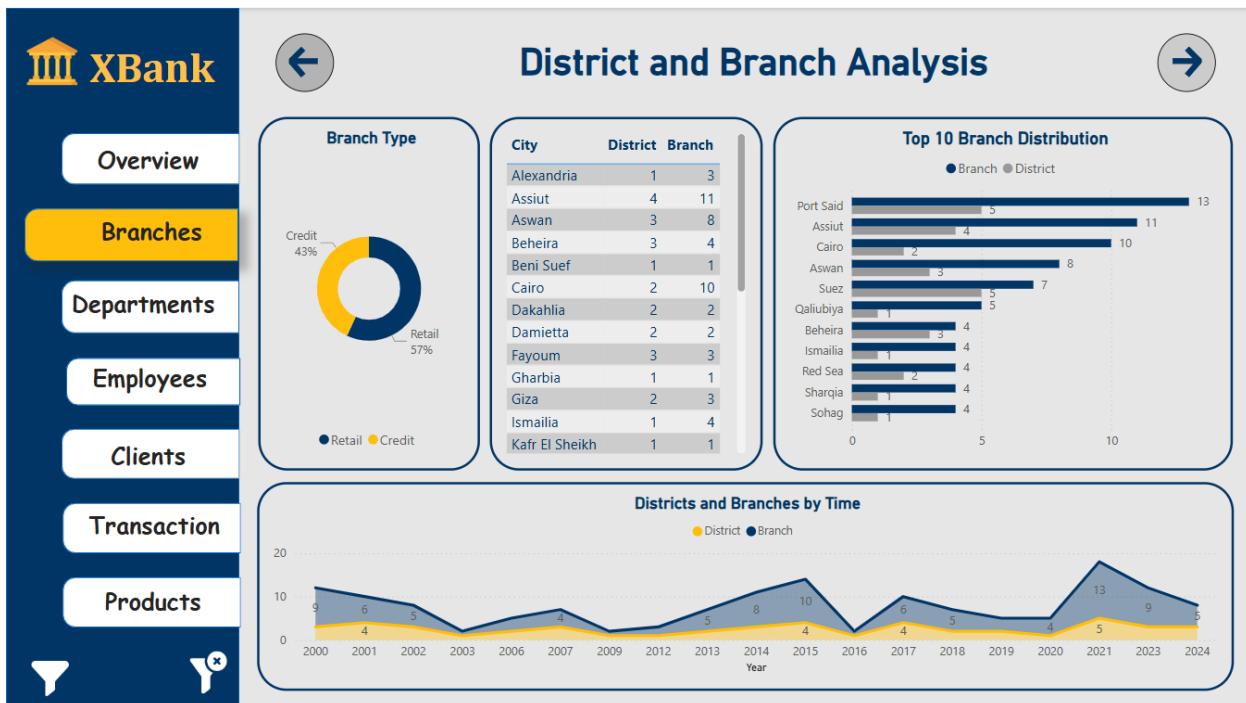
- Shows the number of services associated with different banking products:
  - Account (737): Most utilized service.
  - Card (610): Popular financial product.
  - Online Banking (184): Digital banking service.
  - Wallet (161): Mobile wallet services.

- Loan (31): Loan-related services.
- Certificate (16): Investment certificate services.

## 5. Branch & Service Selection

- A filter panel allowing users to select a branch and its associated services for focused analysis.

### District Dashboard



provides insights into the bank's branch distribution across different districts and cities, helping in branch management, expansion planning, and resource allocation.

## 1. Branch Type

- Displays the percentage of Retail and Credit branches.
- Retail (57%) – General banking services.
- Credit (43%) – Focuses on loans and credit-related services.

## 2. Branch Distribution by City and District

- City: Lists various cities where branches exist.
- District: Number of districts within each city that have branches.

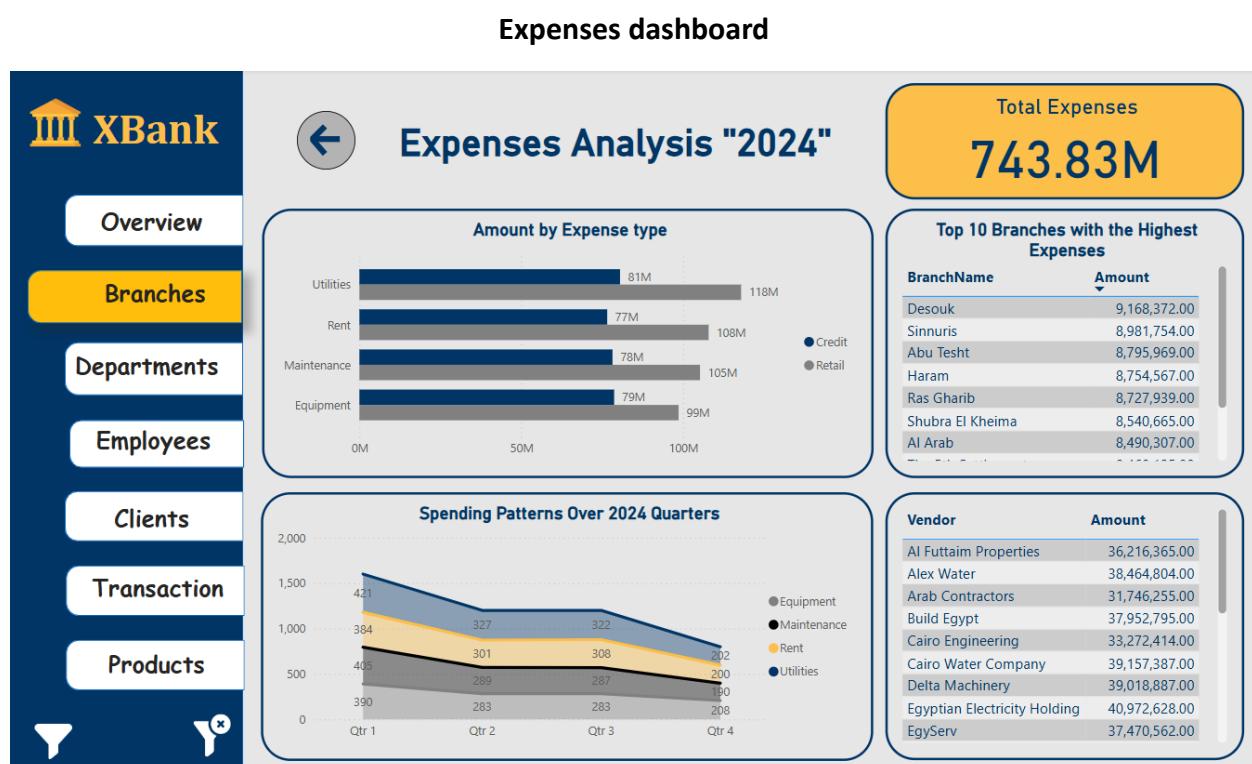
- Branch: Total number of branches in each city.
- Example: Cairo has 10 branches in 2 districts, while Aswan has 8 branches in 3 districts.

### 3. Top 10 Branch Distribution

- Highlights cities with the highest number of branches.
- Port Said (13 branches) has the most branches, followed by Assiut (11) and Cairo (10).
- The gray bars indicate the number of districts, showing how branches are spread across them.

### 4. Districts and Branches by Time

- Tracks the growth of branches and districts over time.
- The blue line represents the number of branches opened per year.
- The yellow line represents the number of districts with branch expansions.
- Peaks in 2015 and 2021 suggest major expansion phases



provides insights into the bank's expenses across branches, expense categories, and vendors for the year 2024.

#### 1. Total Expenses

- The bank's total expenses for 2024 amount to 743.83M.

#### 2. Amount by Expense Type

- Compares expenses between Retail and Credit branches.
- Major expense categories include Utilities, Rent, Maintenance, and Equipment.
- Credit branches spend less than Retail branches in all categories.

#### 3. Top 10 Branches with the Highest Expenses

- Displays the branches with the highest expenses.
- The Desouk branch has the highest expense (9.16M), followed by Sinnuris (8.98M) and Abu Tesht (8.79M).

#### 4. Spending Patterns Over 2024 Quarters

- Tracks the trend of expenses over the four quarters of 2024.
- Expenses decrease gradually throughout the year, with the highest in Q1 and the lowest in Q4.
- Categories like Equipment and Maintenance show the largest declines over time.

#### 5. Vendor Expenses

- Lists vendors that the bank has major expenses with.
- The highest payments were made to Egyptian Electricity Holding (40.97M), Alex Water (38.46M), and Build Egypt (37.95M).

## ATM dashboards

**XBank ATM and Branch Insights**

**ATM Overview:** Total ATMs: 200. Status: Active 75%, Inactive 25%.

**Top 5 Cities by number of ATMs:**

City	ATMs
Port Said	26
Suez	20
Cairo	19
Assuit	18
Sharqia	12

**ATM Deployment Over the Years:**

Year	ATMs
2000	13
2001	15
2002	12
2003	12
2004	6
2007	7
2008	10
2013	25
2014	12
2015	11
2016	6
2017	7
2018	11
2019	6
2020	6
2021	7
2022	18
2023	16
2024	12
2025	13

**Branches:**

- Overview
- Branches
- Departments
- Employees
- Clients
- Transaction
- Products

**XBank ATM Analysis By Branch**

**Count of ATM by District:**

District	Count
1	115
2	31
3	30
4	16
5	8

**Top 4 Branches by ATM count:**

Branch	Count
Attaka	8
Port Fouad	6
Abu Tesht	5
Kom Ombo	5
Maadi	5
Manfalut	5
Montaza	5
Sharm El Sheikh	5
Sheikh Zayed	5

**Count of ATM by Branch and Status:**

Branch	Active	Inactive
Attaka	8	3
Port Fouad	5	1
Abu Tesht	4	1
Kom Ombo	3	2
Maadi	2	3
Manfalut	4	1
Montaza	4	1
Sharm El B...	5	1
Sheikh Za...	2	3
Aleqah	4	1
Dishna	4	1
Diyub Ne...	3	2
Kart Shukr	2	1
Kharga	4	1
New Dam...	3	1
Abnub	2	1
Banha	3	1
Belqas	3	1
Biba	3	1
Bilbeis	3	1
Desouk	3	1
Edufu	3	2
El Shorouk	1	1
Fayoum	2	1

**Maintenance History:**

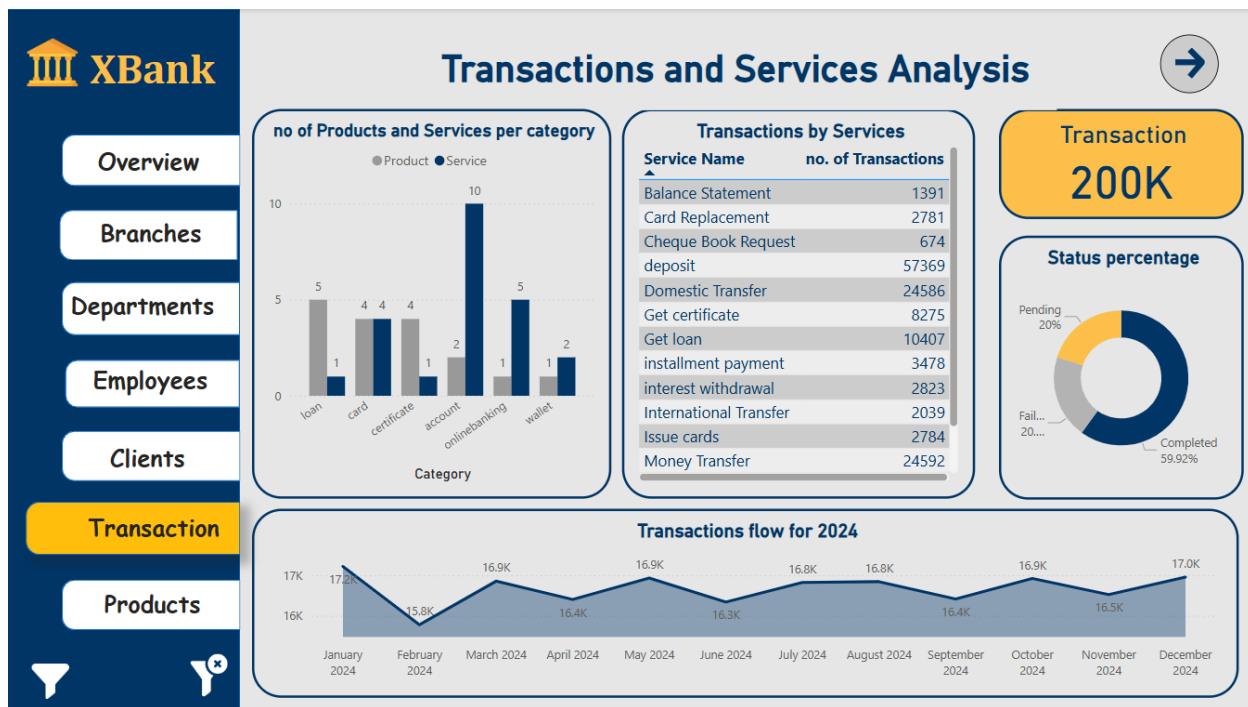
ATM Num	Last Maintenance	Branch Name	Months Since Last Maintenance
4662	Saturday, August 21, 2021	Abnub	43
7063	Saturday, May 15, 2021	Abnub	46
9681	Sunday, January 10, 2021	Abnub	50
3625	Saturday, April 28, 2001	Abu Suwir	287
8268	Thursday, December 21, 2000	Abu Suwir	291
10119	Saturday, June 06, 2009	Abu Tacht	117

**Branches:**

- Overview
- Branches
- Departments
- Employees
- Clients
- Transaction
- Products

- Total ATMs: The bank operates 200 ATMs, with 75% active and 25% inactive.
- Top 5 Cities by ATM Count:
  - Port Said (26 ATMs) has the highest number of ATMs, followed by Suez (20), Cairo (19), Assiut (18), and Sharqia (12).
- ATM Deployment Over the Years:
  - ATM deployment increased significantly in 2015 (25 ATMs added), followed by fluctuations in later years.
  - A decline is observed in recent years, possibly due to maintenance or a shift in digital banking strategies.
- Branch & ATM Details:
  - Assiut has the highest number of ATMs (18) with a cash capacity of 93.6M.
  - Cairo follows with 19 ATMs and a cash capacity of 92.8M.
  - Other cities such as Alexandria, Beheira, and Damietta also contribute significantly.
- ATM Count by District:
  - District 1 has the highest number of ATMs (115), followed by Districts 2 (31), 3 (30), 4 (16), and 5 (8).
- ATM Count by Branch & Status:
  - Attaka branch has the most ATMs (8), followed by Port Fouad (6), Abu Tesht (5), and Kom Ombo (5).
  - Most ATMs are functional, but some branches have inactive ATMs, indicating potential maintenance issues.
- ATM Maintenance Data:
  - Some ATMs have not been serviced for extended periods, with Abu Suwir ATMs having the longest maintenance gap (287-291 months).
  - Other ATMs, such as in Abnub and Abu Tesht, also require urgent maintenance.

## Transaction dashboard



### 1. Overview

- The total number of transactions recorded: 200K
- Transaction Status Breakdown:
  - 59.92% of transactions were successfully completed.
  - 20% of transactions are still pending.
  - 20% of transactions failed due to various reasons (e.g., system errors, insufficient funds).

### 2. Products and Services Categorization

- The analysis categorizes banking offerings into products and services:
  - Products: Loans, cards, certificates, accounts, wallets, and online banking.
  - Services: Account management, transactions, and banking operations.
- Online banking services dominate with the highest count (10), followed by wallets (5) and cards (4).

### 3. Transactions by Service Type

The table presents transaction volume for various banking services:

- Highest Transaction Counts:
  - Deposits (57,369 transactions) – the most frequently used service.
  - Money Transfers (24,592 transactions) – another highly used service.
  - Domestic Transfers (24,586 transactions) – high volume, indicating active internal fund movement.
- Other Notable Transactions:
  - Loans (10,407 transactions) – a significant number of loan-related processes.
  - Get Certificate (8,275 transactions) – indicating high document request activity.
  - Card Replacements (2,781 transactions) – suggests frequent card losses or renewals.
  - International Transfers (2,039 transactions) – relatively lower but still relevant for cross-border payments.

---

### 4. Transactions Flow (2024)

- Monthly transaction trends indicate fluctuations in banking activity:
  - Highest peak: January (17.2K transactions) and December (17K transactions), likely due to salary processing, bonuses, and year-end financial activities.
  - Lowest recorded transactions: February (15.8K transactions) – possible seasonal banking behavior.
  - Stable transaction flow: Transactions hovered between 16.3K - 16.9K in mid-year months.
  - Spikes observed: In May and October (16.9K each), possibly due to financial product renewals or seasonal banking needs.

## More details about transactions

**XBank**

- Overview
- Branches
- Departments
- Employees
- Clients
- Transaction
- Products

**Transaction Details by Product**

**Product 17**    **Service 14**

ServiceName	Business	car	credit	current	debit	diamond	gold	housing	onlinebanking	payroll	personal	platinum	prepaid	saving		
Balance Statement				670										721		
Card Replacement				680		693								714		
Cheque Book Request					674											
deposit				8098	8137	8237				8092		8301	8312			
Domestic Transfer					8148					8109			8329			
Get certificate						2774				2736			2765			
Get loan						3370				3550			3487			
installment payment			693	658				719			678					
interest withdrawal							724	713				688				
International Transfer					665					671			703			
Issue cards					684		708				694		698			
Money Transfer						8246				8110			8236			
Notary Services						686							698			
withdrawal					8186	8142	8226				8105		8143	8368		
<b>Total</b>	<b>693</b>	<b>658</b>	<b>17648</b>	<b>41512</b>	<b>17864</b>		<b>724</b>	<b>713</b>	<b>719</b>		<b>23176</b>	<b>17585</b>	<b>678</b>	<b>688</b>	<b>17856</b>	<b>41619</b>

**Transactions count by Product name**

### 1. Overview

- The bank offers **17 financial products** and **14 services**.
- Transactions are categorized based on different **banking products**, such as **saving accounts, current accounts, credit accounts, debit accounts, online banking, payroll accounts, and more**.

### 2. Transaction Breakdown by Product

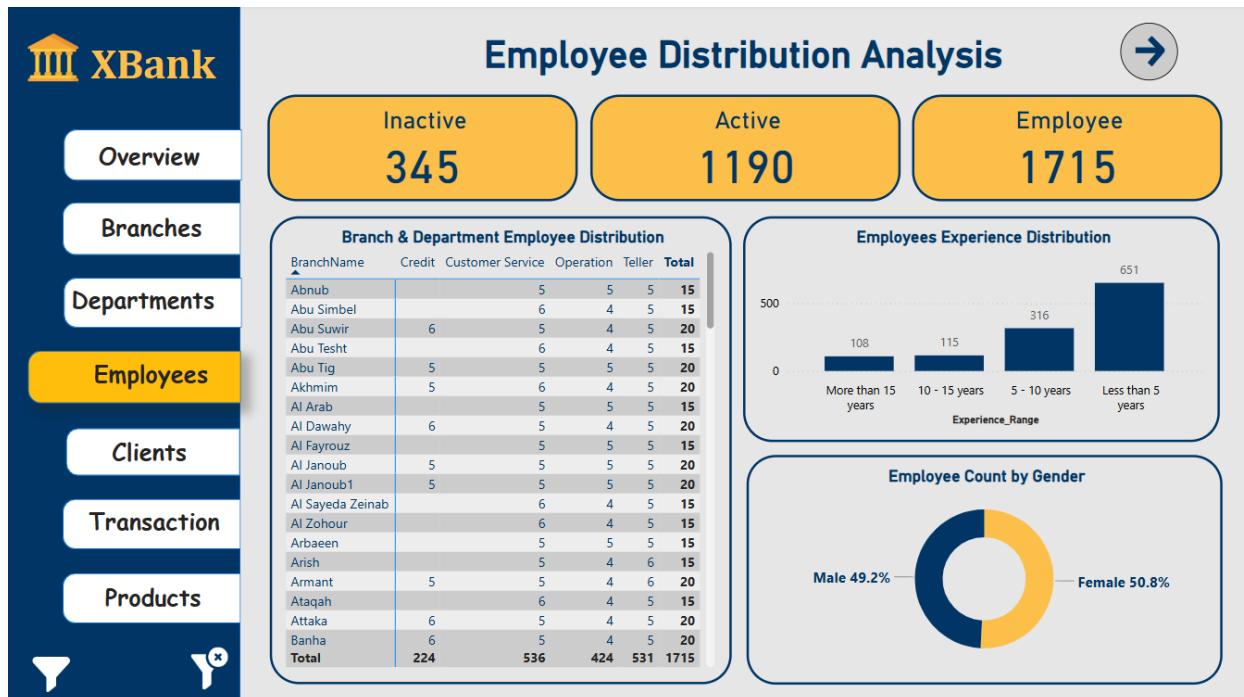
- The table presents transaction volumes for various services across different banking products.
- Highest Transaction Volumes:**
  - Deposits:** High activity across current, debit, and saving accounts (**8,098 to 8,312 transactions per category**).
  - Domestic Transfers:** **8,148 to 8,329 transactions**, showing frequent fund movements.
  - Withdrawals:** Ranges from **8,142 to 8,368 transactions**, indicating high cash-out activity.

- **Money Transfers:** 8,246 transactions, highlighting fund transfer needs.
  - **Installment Payments & Loans:** Loan-related transactions (3,370 for Get Loan) indicate strong borrowing trends.
- 

### 3. Transactions Count by Product Name

- The **most used banking products** based on transaction volume:
    - **Saving & Current Accounts (42K transactions each)** – the most utilized accounts for financial activities.
    - **Online Banking (23K transactions)** – indicating a shift toward digital banking services.
    - **Debit, Prepaid, Credit, Payroll, and Wallet products (~18K each)** – showing diverse financial engagements.
    - **SME & Specialized Products (~1K each)** – lower transaction volume but relevant for niche banking needs.
- 

#### Employee dashboard



## **1. Overview**

- The bank has a total of **1,715 employees**, categorized as:
  - **Active Employees: 1,190**
  - **Inactive Employees: 345**

This reflects that **69.4% of employees are actively engaged**, while **30.6% are currently inactive**.

---

## **2. Branch & Department Employee Distribution**

- Employees are distributed across different branches and roles, including:
    - **Credit**
    - **Customer Service**
    - **Operations**
    - **Tellers**
  - The table shows that each branch typically has between **15 to 20 employees**, ensuring balanced resource allocation across operations.
- 

## **3. Employees Experience Distribution**

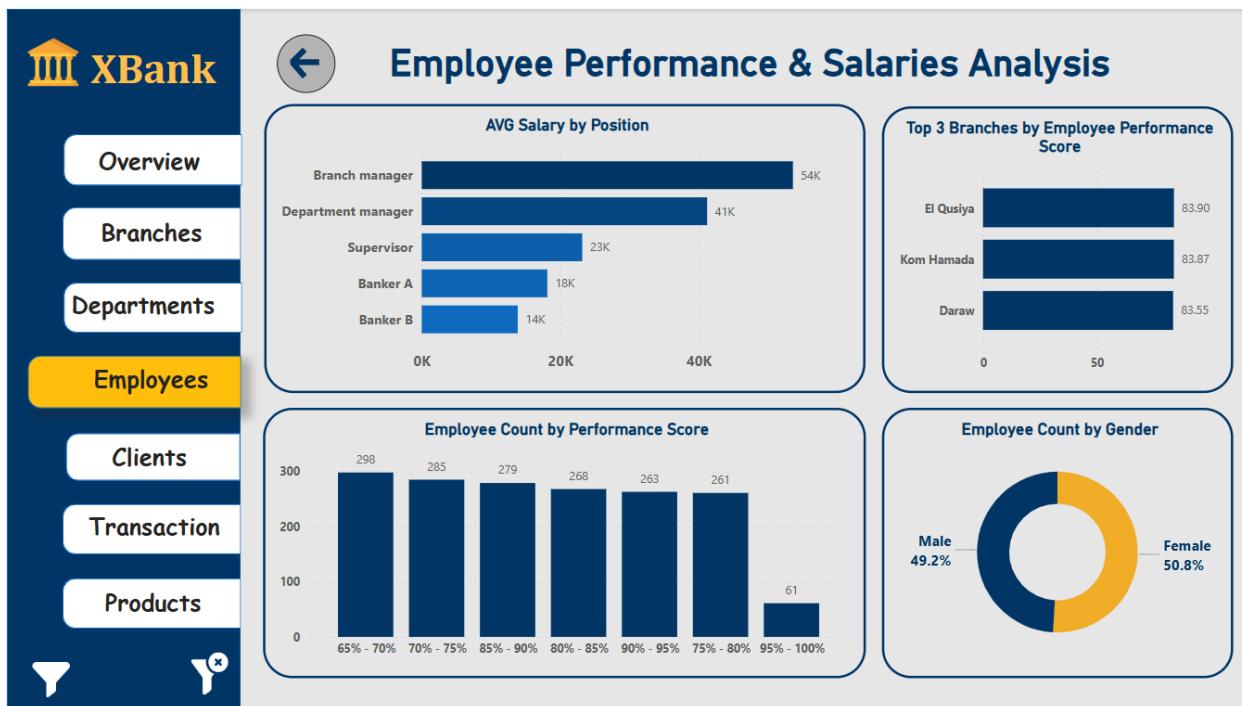
- Employee experience is categorized into four ranges:
    - **More than 15 years: 108 employees**
    - **10 - 15 years: 115 employees**
    - **5 - 10 years: 316 employees**
    - **Less than 5 years: 651 employees**
- 

## **4. Employee Count by Gender**

- **Female Employees: 50.8%**
- **Male Employees: 49.2%**

## 5. Key Insights

1. **The bank maintains an even gender distribution**, supporting diversity and inclusion.
2. **A large percentage of employees are relatively new (<5 years of experience)**, indicating a younger workforce that may require further training and development.
3. **Employee distribution across branches is well-structured**, with most branches maintaining between 15-20 employees.
4. **30.6% of employees are inactive**, which could indicate opportunities to optimize workforce engagement and productivity.



### 1. Average Salary by Position

The dashboard displays the average salary for different job roles in the bank:

- **Branch Manager: 54K**
- **Department Manager: 41K**
- **Supervisor: 23K**
- **Banker A: 18K**
- **Banker B: 14K**

## **2. Top 3 Branches by Employee Performance Score**

The highest-performing branches based on employee performance scores are:

- 1. El Qusiya – 83.90**
  - 2. Kom Hamada – 83.87**
  - 3. Daraw – 83.55**
- 

## **3. Employee Count by Performance Score**

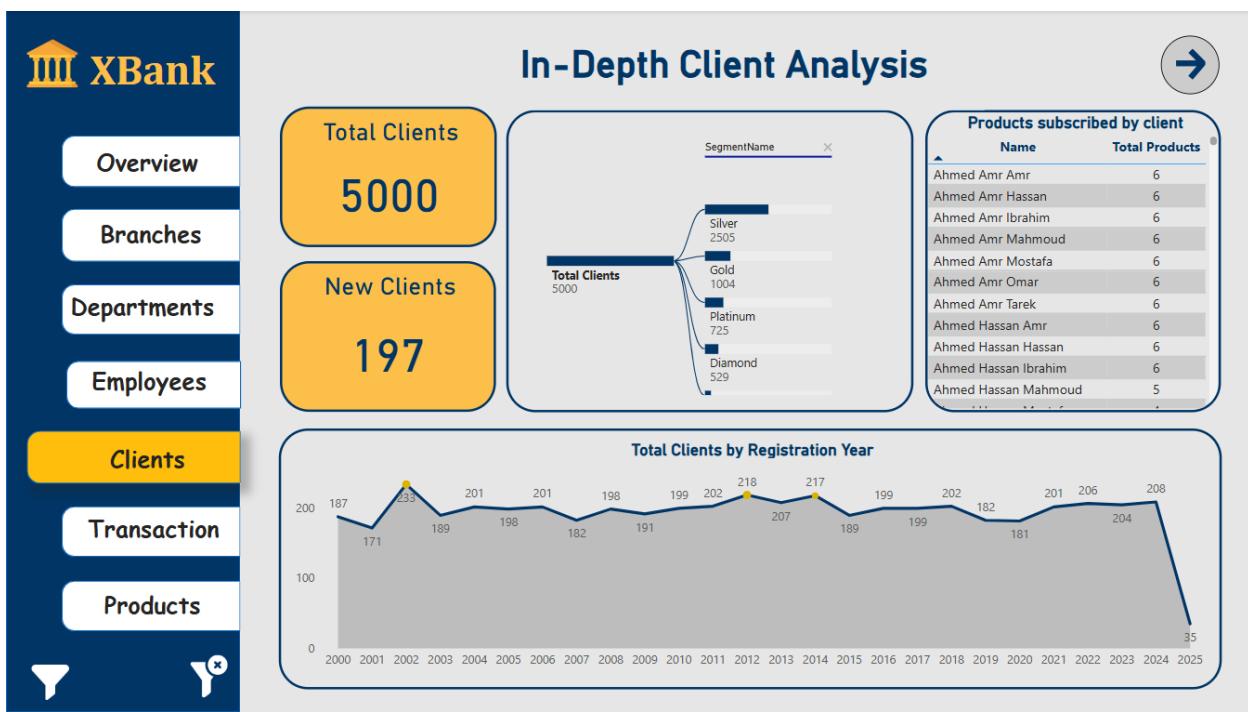
Employees are categorized based on their performance scores in percentage ranges:

- 65% - 70%: 298 employees**
  - 70% - 75%: 285 employees**
  - 75% - 80%: 261 employees**
  - 80% - 85%: 268 employees**
  - 85% - 90%: 279 employees**
  - 90% - 95%: 263 employees**
  - 95% - 100%: 61 employees**
- 

## **4. Employee Count by Gender**

- Female Employees: 50.8%**
- Male Employees: 49.2%**

## Client dashboard



### 1. Total Clients & New Clients

- Total Clients:** 5000
- New Clients:** 197

### 2. Client Segmentation

Clients are categorized into four segments:

- Silver:** 2505 clients (Largest segment)
- Gold:** 1004 clients
- Platinum:** 725 clients
- Diamond:** 529 clients (Smallest segment)

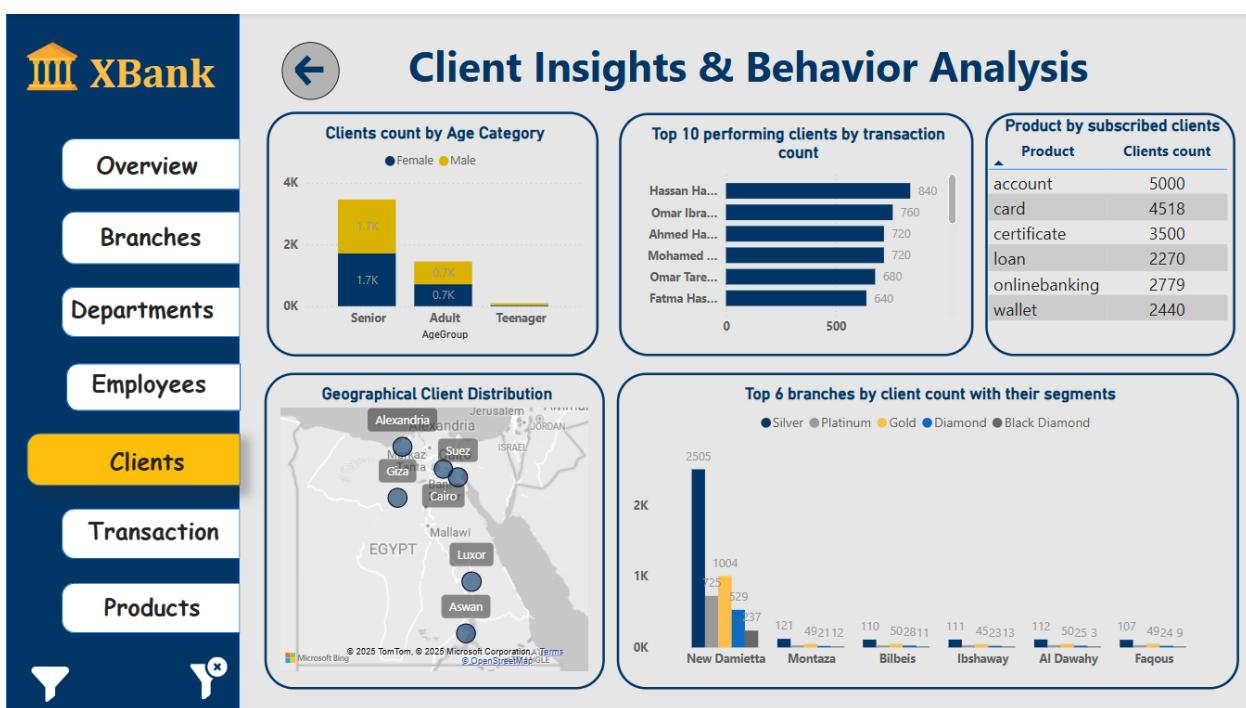
### 3. Products Subscribed by Clients

A table lists clients and the number of banking products they have subscribed to. Many clients have **6 products**, suggesting strong cross-selling efforts.

#### 4. Total Clients by Registration Year

A line chart visualizes the number of clients joining per year:

- The **highest peak** was in **2012 (218 clients)**.
- **2024 had 208 new clients**, maintaining a steady growth rate.
- **2025 (so far)** has only **35 clients**, which may be due to the early part of the year.



##### 1. Clients Count by Age Category

- **Seniors** (largest group): **1.7K Male, 1.7K Female**
- **Adults**: **0.7K Male, 0.7K Female**
- **Teenagers**: No significant count displayed.

##### 2. Top 10 Performing Clients by Transaction Count

- **Highest transactions: Hassan Ha... (840 transactions)**

- Other high-performing clients: Omar Ibra... (760 transactions), Ahmed Ha... (720 transactions), Mohamed ... (720 transactions), Omar Tare... (680 transactions), Fatma Has... (640 transactions).
- 

### **3. Products Subscribed by Clients**

- Accounts: 5000 clients
  - Cards: 4518 clients
  - Certificates: 3500 clients
  - Loans: 2270 clients
  - Online banking: 2779 clients
  - Wallets: 2440 clients
- 

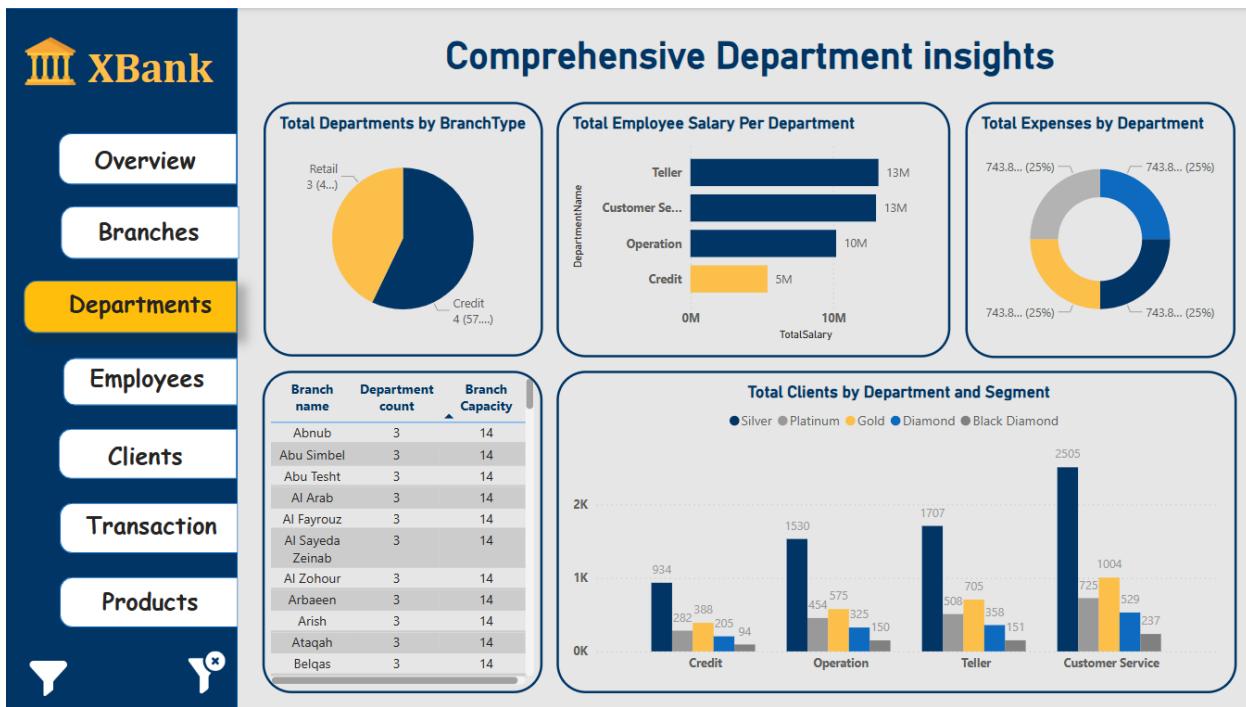
### **4. Geographical Client Distribution**

- Major client concentrations are in **Alexandria, Giza, Cairo, Suez, Luxor, and Aswan**.
- 

### **5. Top 6 Branches by Client Count & Segments**

- **New Damietta** has the highest number of **Silver** clients (2505).
- Other branches like **Montaza, Bilbeis, Ibshaway, Al Dawahy, and Faqous** have lower counts, with a mix of **Silver, Platinum, Gold, and Diamond** clients.

## Department dashboard



### 1. Total Departments by Branch Type

- Credit Departments: 4 branches (57% of total)
- Retail Departments: 3 branches (43% of total)

### 2. Total Employee Salary Per Department

- Teller Department: 13M
- Customer Service Department: 13M
- Operations Department: 10M
- Credit Department: 5M

### 3. Total Expenses by Department

- Each department contributes equally to expenses (25% each).

### 4. Branch Capacity and Department Count

- Each branch has 3 departments with a capacity of 14 employees.

---

## 5. Total Clients by Department and Segment

- **Credit Department:**

- **Silver:** 934
- **Platinum:** 282
- **Gold:** 388
- **Diamond:** 205
- **Black Diamond:** 94

- **Operations Department:**

- **Silver:** 1530
- **Platinum:** 454
- **Gold:** 575
- **Diamond:** 325
- **Black Diamond:** 150

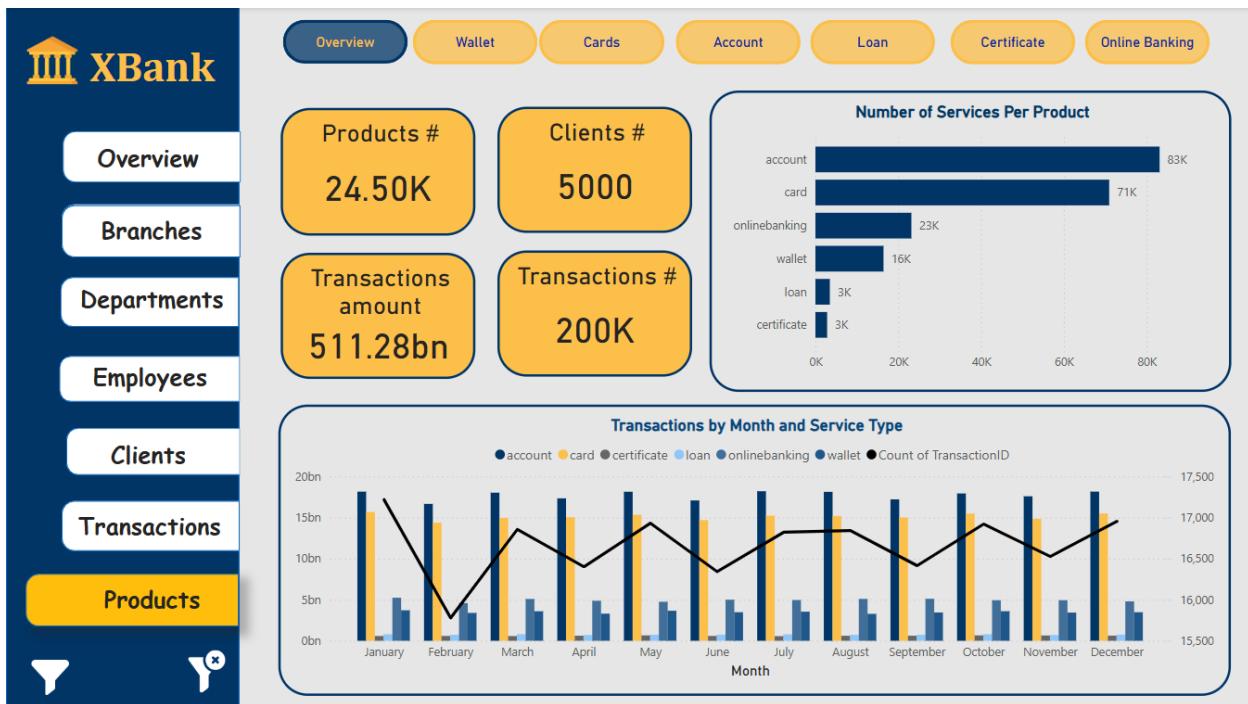
- **Teller Department:**

- **Silver:** 1707
- **Platinum:** 508
- **Gold:** 705
- **Diamond:** 358
- **Black Diamond:** 151

- **Customer Service Department:**

- **Silver:** 2505
  - **Platinum:** 1004
  - **Gold:** 725
  - **Diamond:** 529
  - **Black Diamond:** 237
-

## Product overview



### 1. Key Metrics Overview:

- **Products # (24.50K):** XBank offers a total of 24,500 products across different categories. This could mean the total number of product instances or subscriptions by clients.
- **Clients # (5000):** The bank serves 5,000 clients. This gives an idea of the customer base.
- **Transactions Amount (511.28bn):** The total value of transactions processed is 511.28 billion. This indicates the volume of business handled.
- **Transactions # (200K):** The total number of transactions is 200,000, showing the activity level across all products.

### 2. Number of Services Per Product:

- **Accounts (83K):** The most popular product, with 83,000 services, suggesting a strong reliance on account-related products.
- **Cards (71K):** Cards come next, with 71,000 services, indicating widespread card usage.

- **Online Banking (23K):** Online banking has 23,000 services, reflecting decent digital engagement.
- **Wallet (16K):** Wallet services account for 16,000, showing moderate adoption.
- **Loans (3K) & Certificates (3K):** Loans and certificates have relatively low numbers, each at 3,000, possibly indicating either niche use or untapped potential.

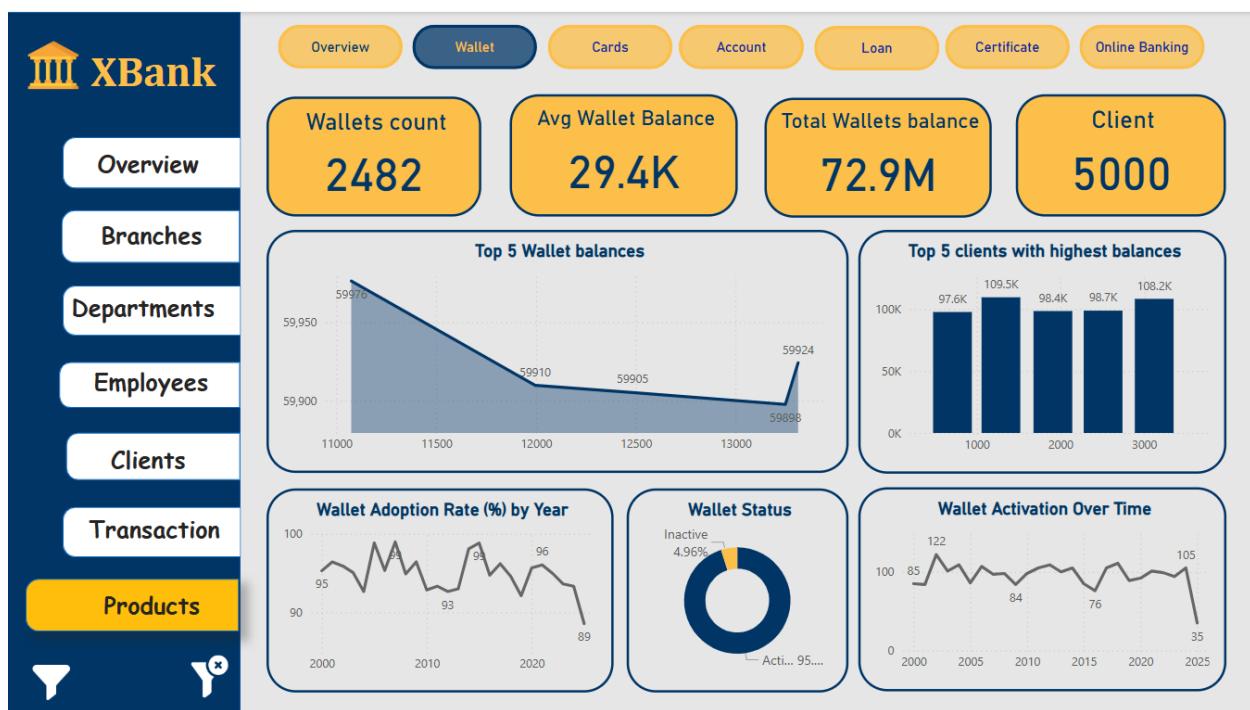
### 3. Transactions by Month and Service Type:

- **Monthly Trends:** Each month shows transaction activity across different services (accounts, cards, certificates, loans, online banking, and wallets).
- **Account Transactions:** Account-related transactions consistently lead every month, aligning with the high number of account services.
- **Card Transactions:** Cards are the second most used service, with steady transaction volumes.
- **Other Services:** Online banking, wallets, loans, and certificates show lower but consistent contributions.
- **Transaction Count (Black Line):** The black line shows the total count of transactions per month, which is relatively stable, with minor fluctuations throughout the year.

### Overall Insights:

- Accounts and cards are the primary drivers of both service uptake and transaction volumes.
- Online banking and wallets have moderate adoption, hinting at digital growth opportunities.
- Loans and certificates are underutilized, potentially due to less demand or less promotion.
- Monthly transaction volumes are stable, indicating consistent customer engagement throughout the year.

## Wallet dashboard



### Key Metrics Overview:

- Wallets Count (2,482):** The total number of wallets is 2,482, showing the bank's digital wallet user base.
- Avg Wallet Balance (29.4K):** Each wallet holds an average balance of 29.4K, indicating decent wallet funding.
- Total Wallet Balance (72.9M):** The combined balance across all wallets is 72.9 million, reflecting the scale of funds held in digital wallets.
- Clients (5,000):** Reinforces the total client base, indicating a good proportion of clients use wallets.

### Top 5 Wallet Balances:

- The highest wallet balances range from **59,924** to **59,898**, showing that a few users hold significantly larger funds.
- There's a steep drop from the top wallet to the others, suggesting wealth concentration among a few clients.

### Top 5 Clients with Highest Balances:

- The top 5 clients have balances between **97.6K** and **109.5K**.

- The wealthiest client holds **109.5K**, while the fifth holds **108.2K**, meaning high-value clients are clustered at the top.

#### ② Wallet Adoption Rate (%) by Year:

- Adoption peaked around **96%** in recent years but declined to **89%** recently.
- This drop could suggest saturation, competition, or a need for better engagement strategies.

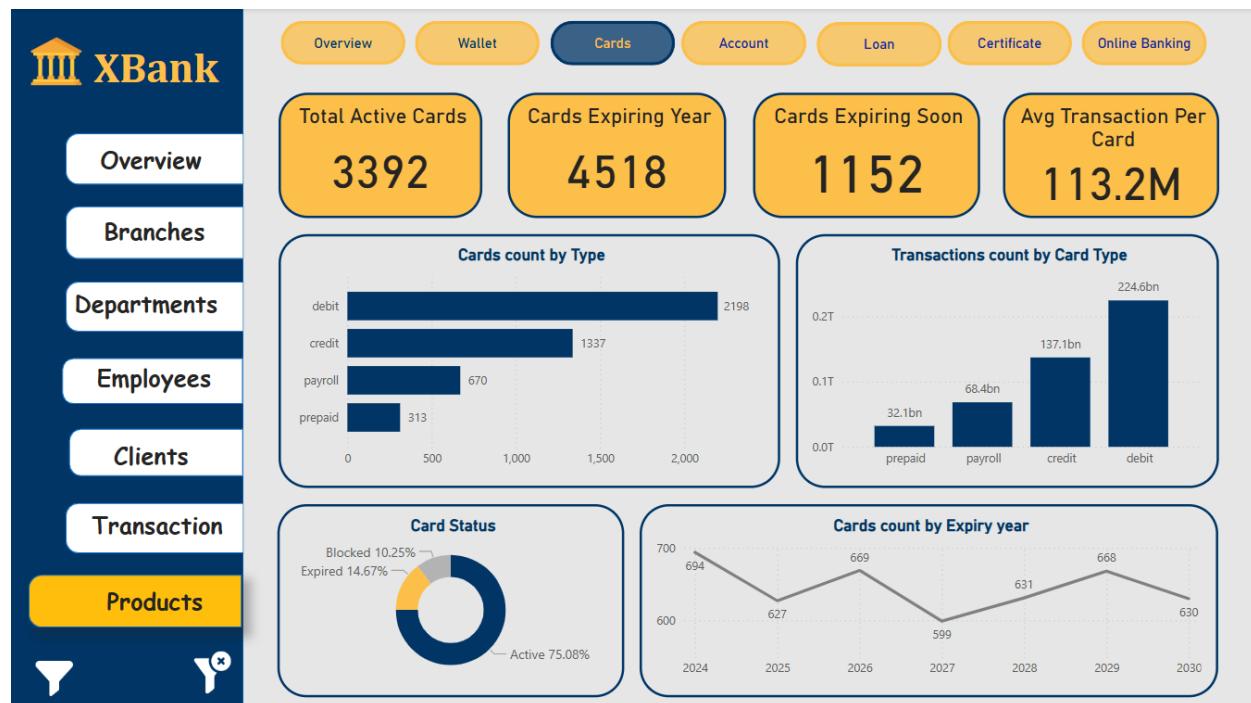
#### ③ Wallet Status:

- Active Wallets (95.04%)**: The majority of wallets are active, which is a positive sign of engagement.
- Inactive Wallets (4.96%)**: A small percentage of wallets are inactive, presenting an opportunity to reactivate dormant users.

#### ④ Wallet Activation Over Time:

- Activation numbers fluctuated over the years, peaking at **122** and dropping recently to **35**.
- The recent decline could imply waning interest, possibly requiring marketing efforts to boost adoption again.

### Cards dashboard



## ② Key Metrics Overview:

- **Total Active Cards (3,392):** Indicates the total number of currently active cards, a crucial measure of user engagement.
- **Cards Expiring This Year (4,518):** A significant number of cards will expire this year, requiring prompt renewal actions.
- **Cards Expiring Soon (1,152):** Immediate attention is needed for these cards to avoid disruption in service.
- **Avg Transaction Per Card (113.2M):** Suggests high transaction volume per card, which might be driven by high-value clients or frequent usage.

## ③ Cards Count by Type:

- **Debit Cards (2,198):** Make up the majority, showing strong preference for direct bank access.
- **Credit Cards (1,337):** Substantial user base, but smaller compared to debit cards.
- **Payroll Cards (670):** Used primarily for salary disbursements — could grow with corporate partnerships.
- **Prepaid Cards (313):** Niche use, possibly for gifting or controlled spending.

## ④ Transactions Count by Card Type:

- **Debit (224.6bn):** Accounts for the bulk of transactions, reflecting its widespread use.
- **Credit (137.1bn):** Strong contribution, highlighting users' reliance on credit for purchases.
- **Payroll (68.4bn):** Indicates regular usage, likely for withdrawals and purchases post-salary credit.
- **Prepaid (32.1bn):** Smallest share, consistent with its limited issuance.

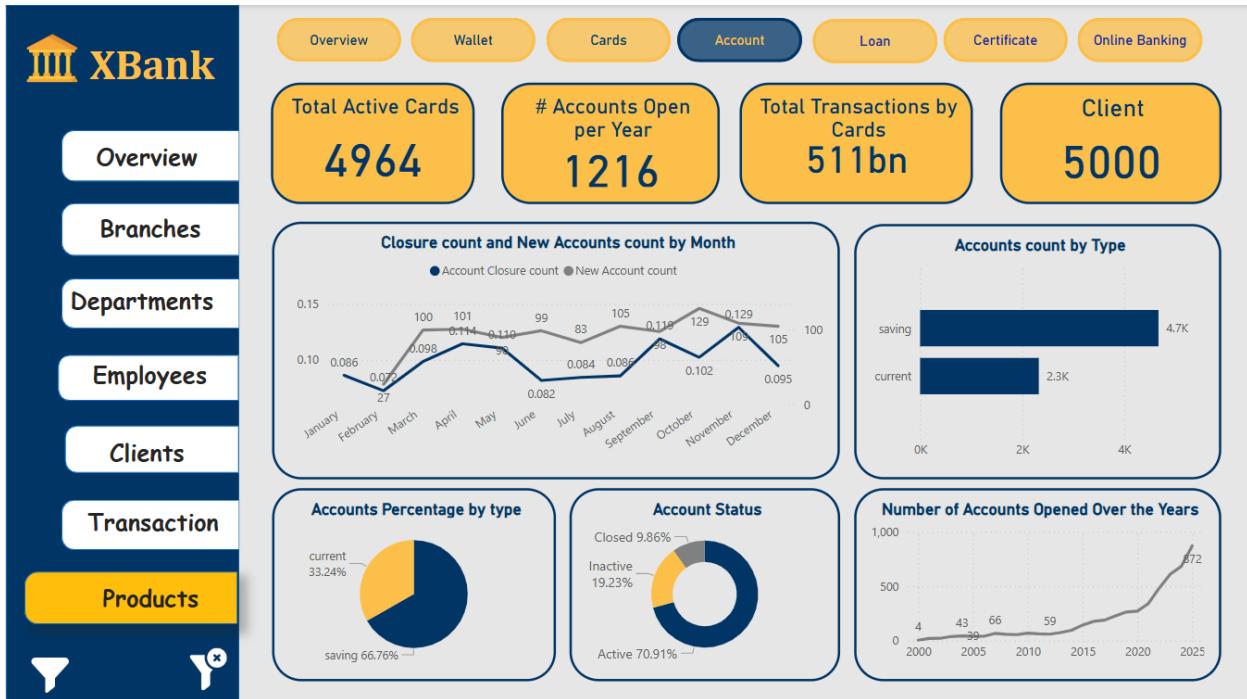
## ⑤ Card Status:

- **Active (75.08%):** Healthy proportion of active cards.
- **Blocked (10.25%):** Requires investigation — potentially due to fraud prevention or unpaid dues.
- **Expired (14.67%):** Suggests a need for better renewal reminders or auto-renewal processes.

## ⑥ Cards Count by Expiry Year:

- Shows fluctuating expiry rates, with a peak in 2025 and 2029. Planning for timely renewals is key to maintaining active card numbers.

## Account dashboard



### Key Metrics Overview:

- Total Active Cards (4964):** There are 4,964 active cards in circulation, indicating the bank's cardholder base.
- # Accounts Open per Year (1216):** 1,216 accounts were opened in the most recent year, reflecting growth and client acquisition.
- Total Transactions by Cards (511bn):** The total value of card transactions has reached 511 billion, showing high card usage for payments.
- Client Count (5000):** The bank serves 5,000 clients, aligning with the previous dashboard and reinforcing the customer base size.

### Closure Count and New Accounts Count by Month:

- Trends:** The grey line shows new account openings, while the blue line shows closures.
  - New Accounts:** Relatively steady across the year, peaking in November (129).

- **Closures:** Lower than new accounts, indicating positive net growth, but there are occasional spikes, like in April.

#### ② Accounts Count by Type:

- **Savings Accounts (4.7K):** Savings accounts dominate, making up the majority of the accounts.
- **Current Accounts (2.3K):** Current accounts are fewer, suggesting clients are more focused on saving.

#### ③ Accounts Percentage by Type:

- Savings accounts represent **66.76%**, while current accounts make up **33.24%** of total accounts. This matches the count data and reinforces the focus on savings products.

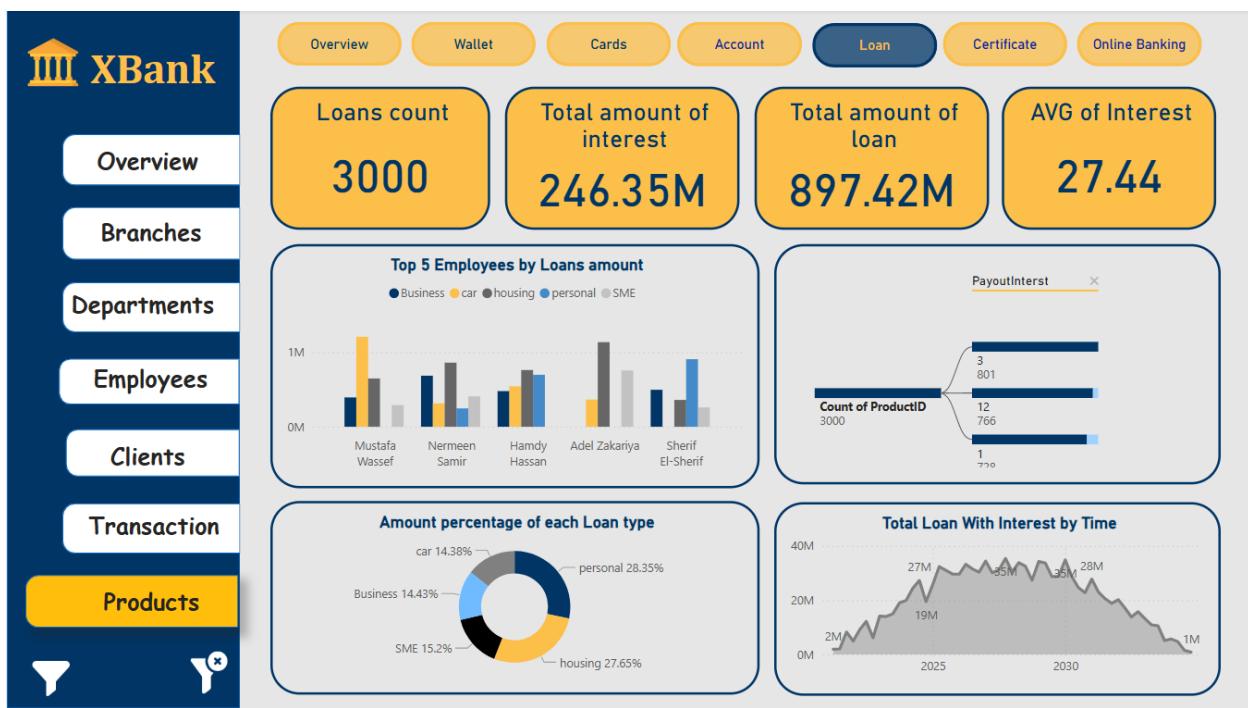
#### ④ Account Status:

- **Active Accounts (70.91%):** Most accounts are active, which is healthy.
- **Inactive Accounts (19.23%):** A notable percentage is inactive, representing opportunities for re-engagement.
- **Closed Accounts (9.86%):** A smaller portion has been closed, suggesting stable customer retention overall.

#### ⑤ Number of Accounts Opened Over the Years:

- There's been consistent growth, with noticeable acceleration in recent years, peaking at **872 accounts** opened in the most recent year. This indicates increasing customer acquisition.
-

## Loan dashboard



### Key Metrics Overview:

- Loans Count (3,000):** Shows the total number of loans issued, reflecting the bank's lending reach.
- Total Amount of Interest (246.35M):** Highlights the bank's earnings from loans through interest, a crucial profit indicator.
- Total Amount of Loan (897.42M):** Represents the cumulative loan amount, showcasing the bank's credit exposure.
- Average Interest (27.44):** Indicates the average interest rate applied — relatively high, suggesting either high-risk lending or focus on high-interest products.

### Top 5 Employees by Loan Amount:

- Adel Zakariya:** Leads with the highest loan disbursements, particularly in SME and housing sectors.
- Mustafa Wassef:** Strong performance in housing loans, indicating specialization in that area.
- Nermeen Samir and Hamdy Hassan:** Balanced contributions across different loan types.
- Sherif El-Sherif:** Notable focus on business loans.

### Amount Percentage of Each Loan Type:

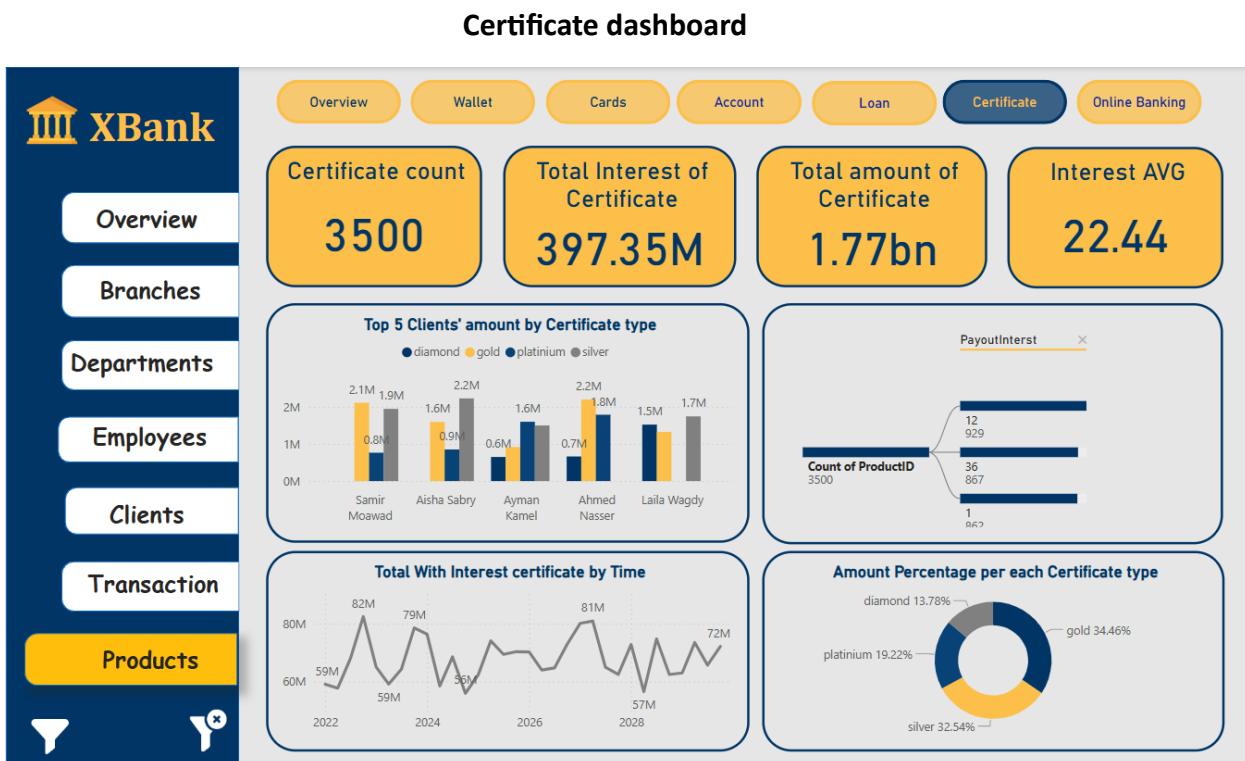
- **Personal Loans (28.35%)**: Largest share, implying high demand or ease of approval.
- **Housing Loans (27.65%)**: Close second, likely driven by real estate market conditions.
- **SME Loans (15.2%)**: Significant portion, supporting small and medium-sized enterprises.
- **Business Loans (14.43%) and Car Loans (14.38%)**: Nearly equal, indicating moderate demand for both sectors.

#### ② Payout Interest:

- Three distinct product IDs seem to represent different loan products, each with varying payout interest levels, possibly reflecting product segmentation.

#### ③ Total Loan with Interest by Time:

- The trend shows peak disbursement between 2025 and 2030, followed by a decline. This could indicate tightening credit policies or economic factors reducing demand.



#### ④ Key Metrics Overview:

- **Certificate Count (3,500)**: Reflects the total number of certificates issued.
- **Total Interest of Certificate (397.35M)**: Indicates the accumulated interest earned from all certificates.

- **Total Amount of Certificate (1.77bn):** Shows the total value of issued certificates, representing a significant portion of the bank's investment products.
- **Interest Average (22.44):** Provides insight into the average interest rate across all certificate types.

#### ② Top 5 Clients' Amount by Certificate Type:

- **Samir Moawad:** Holds a high value across all certificate types, particularly in gold and silver.
- **Aisha Sabry and Ahmed Nasser:** Both have notable investments, with Ahmed showing a balanced spread.
- **Ayman Kamel and Laila Wagdy:** Have a slightly lower total but still represent significant contributions.

#### ③ Payout Interest:

- Three product IDs appear, each with different payout interest levels, potentially representing varying certificate products.

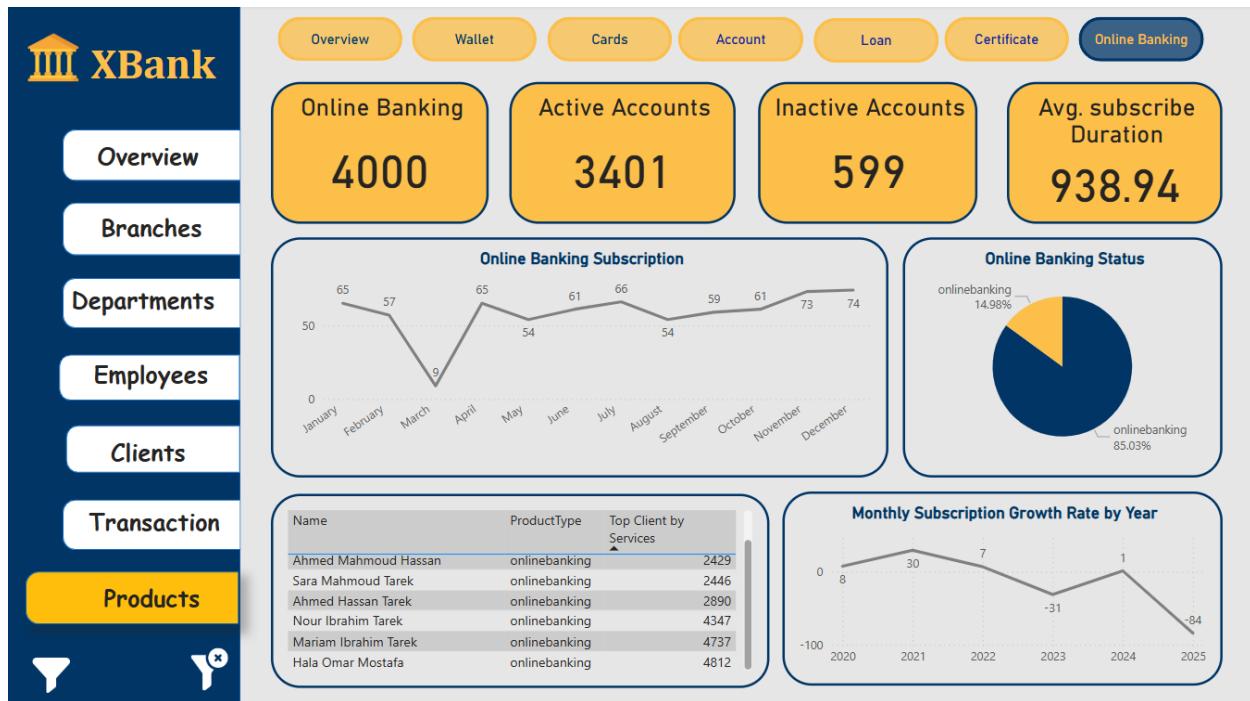
#### ④ Total with Interest Certificate by Time:

- Peaks in 2024 (82M) and 2028 (81M), followed by fluctuations, suggesting market-driven or policy-driven changes in certificate issuance and payouts.

#### ⑤ Amount Percentage per Each Certificate Type:

- **Gold (34.46%):** The most popular certificate type, potentially due to perceived stability.
  - **Silver (32.54%):** Close second, indicating diversified preferences.
  - **Platinum (19.22%) and Diamond (13.78%):** Have smaller shares, possibly due to different interest rates or eligibility criteria.
-

## Online Banking Dashboard



### Key Metrics Overview:

- Online Banking Accounts (4,000):** Represents the total number of online banking subscribers.
- Active Accounts (3,401):** Shows a high activity rate, with ~85% of accounts being active.
- Inactive Accounts (599):** Indicates a relatively low inactivity rate, but worth investigating.
- Average Subscription Duration (938.94):** Suggests long-term engagement, possibly measured in days.

### Online Banking Subscription Trend:

- Subscription numbers fluctuate monthly. March shows a noticeable drop to 9, while other months average around 60 subscriptions. Investigating March's dip could reveal insights for improvement.

### Online Banking Status:

- The majority of accounts (85.03%) are active, reflecting positive user engagement. Inactive accounts make up 14.98%, which could be a focus area for re-engagement campaigns.

### Top Clients by Services:

- Leading clients like Hala Omar Mostafa (4,812 services) and Mariam Ibrahim Tarek (4,737 services) demonstrate high engagement. Understanding their behavior can help replicate it across other users.

#### ⌚ Monthly Subscription Growth Rate by Year:

- Growth peaked in 2021 but steadily declined after, with a sharp drop in 2025 (-84). Strategies to reignite growth could involve new features, marketing, or improved user experiences.
-