ASHESI

FutureNow Asset Management Database System

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Database Management Systems

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Case Study: FutureNow Asset Management

FutureNow is an asset management company that grows the wealth of its clients. They identify clients' financial goals and work to accomplish them via portfolio management—buying and managing stocks, bonds, and funds. The company has branches in Accra, Takoradi, Cape Coast and Kumasi and has managed the assets of over 700 individuals and companies since its inception in August 2021. The company mainly invests client funds in government bonds (because of the lower risk attached) but has client portfolios built on private-enterprise stocks and funds. Its activities are distributed among 2 main departments: the Advisor Services and the Administrative Department.

Operations

FutureNow Asset Management has two categories of clients: private clients and institutional clients. Clients within each category can either allow the company to manage their wealth or seek financial advice regarding their assets. For clients that seek only financial advice a flat fee is charged by the Advisor Services Department for consultation. For clients who request asset management, the Advisor Services conduct a risk profile of that client, after which the Administrative Department opens an account for them. The client is then required to make a deposit which would be used to purchase a particular investment based on their risk profile. Each transaction the client makes (whether a deposit or withdrawal) is tracked from then on, for use in generating a transactional statement. For each client, an investment portfolio records the number of investments made and the total value of the assets under management. Interests on investments are paid into clients' accounts on maturity dates (at maturity both interest and principal are paid into the client's account). An investment statement is issued at the end of a period indicating all the client's investments.

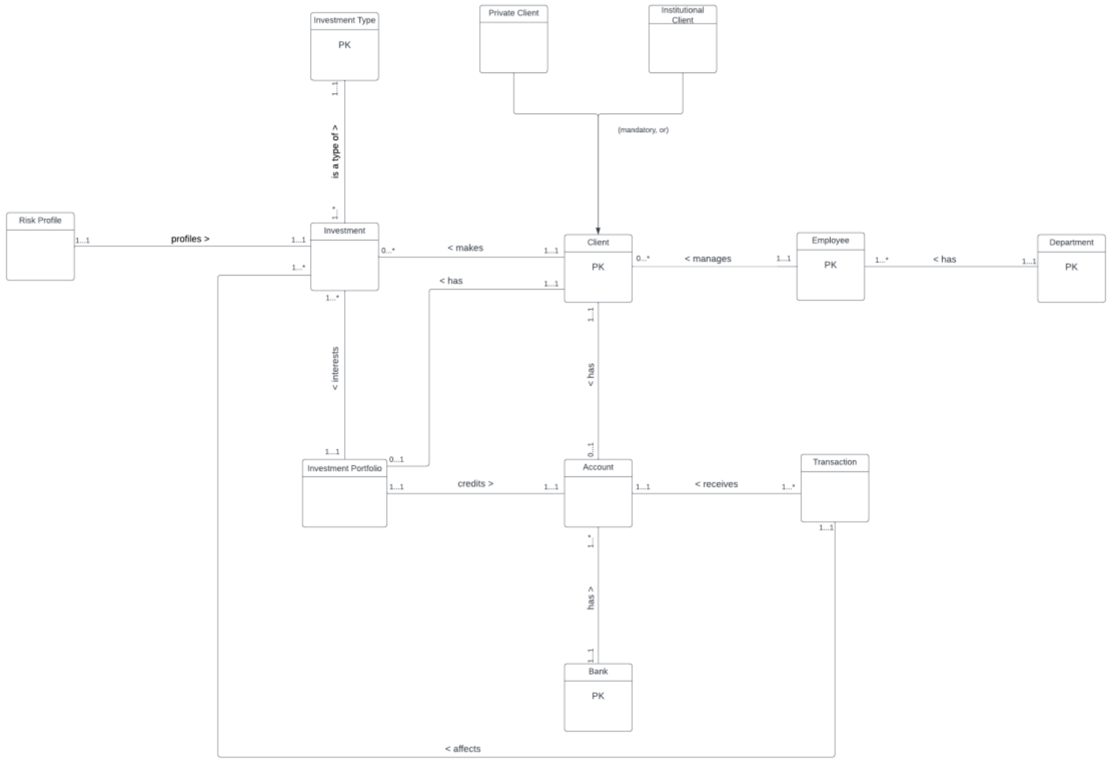
Reason For the Project

FutureNow manages the assets of many clients. Because assets are records of wealth in numbers, it is necessary to ensure the credibility of client data stored. The company finds it difficult to do this by relying on the traditional spreadsheet record system. Management would therefore like to have a system that allows for records to be kept and retrieved more effectively.

The design should enable:

- Management to view all mature investments to ensure they are credited into client accounts
- Management to view the most used investment type to help develop future investments strategies for clients
- Management to view number and the total value of the Assets Under Management (AUM) for each client
- Management to view the portfolio of each client
- Management to view clients' most profitable investments
- Management to view all transactions made by a client for issuing of a transactional statement

EER Diagram



Entities and Attributes

Strong Entities

1. **Departments:** Department Name
2. **Clients:** Email, Telephone, Address
3. **Banks:** Bank Name, Bank Location, Branch
4. **Investment Type:** Type Name, Risk Factor
5. **Employee:** First Name, Last Name, DOB, Email, Telephone, Employment Date

Weak Entities

1. **Risk Profile:** Amount, Reason for Investment, Risk Factor
2. **Account:** Balance, Date Created
3. **Transaction:** Transaction Date, Transaction Type, Amount
4. **Investment:** Investment Type, Investment Details, Principal, Rate, Maturity Date, Risk
5. **Investment Portfolio:** Number of Investments, Value of Assets Under Management

Enterprise Rules

1. - Each department has one or more employees
   - Each employee is under only one department

2. - Each employee manages zero or more clients
   - Each client is managed by only one employee

3. - A client can have zero or more accounts (client can seek only advisory services)
   - Each account belongs to only one client

4. - A client has only one investment portfolio
   - Each investment portfolio belongs to only one client

5. - Each bank has one or more accounts
   - An account is had by only one bank

6. - Each account receives one or more transactions
   - Each transaction is received by only one account

7. - Each transaction affects only one investment
   - Each investment is affected by only one transaction

8. - Each client can have zero or more investments (client can seek only advisory services)
   - Each investment belongs to only one client

9. - Each investment interests only one investment portfolio
   - Each investment portfolio is interested by one or more investments

10. - Each investment portfolio credits only one account
    - Each account is credited by only one investment portfolio

11. - Each investment is a type of only one investment type

- Each investment type is the type of one or more investments

12. - Each risk profile profiles only one investment
    - Each investment is profiled by only one profile

Assumptions:

1. Each client can only open one account
2. A client cannot seek both advisory and asset management services at the same time
3. No investment accumulates compound interest.
4. Each new investment needs a new risk profile, even if the client has made previous investments.

Table Derivation

1: * Binary Relationships:

- Departments (**department_id**, department_name)
- Employees (**employee_id**, *department_id*, first_name, last_name, date_of_birth, email, telephone, employment_date)

- Employees (**employee_id**, *department_id*, first_name, last_name, date_of_birth, email, telephone, employment_date)
- Clients (**telephone**, *employee_id*, email, address)

- Banks (**bank_id,** bank_name, bank_location)
- Accounts (**account_id**, *bank_id*, balance, date_created)

- Accounts (**<u>account_id</u>**, *bank_id*, balance, date_created)
- Transactions (**<u>transaction_id</u>**, *account_id*, amount, transaction_date)

- Investment Portfolio (**<u>portfolio_id</u>**, total_assets_under_management)
- Investments (**<u>investment_id</u>**, *portfolio_id*, investment_details, principal, rate, maturity_date)

- Transactions (**<u>transaction_id</u>**, amount, transaction_date, transaction_type)
- Investments (**<u>investment_id</u>**, *portfolio_id*, *transaction_id*, investment_details, principal, rate, maturity_date)

- Clients (**<u>telephone</u>**, *employee_id*, email, address)
- Investments (**<u>investment_id</u>**, *portfolio_id*, *transaction_id*, *telephone*, investment_details, principal, rate, maturity_date)

- Investment Type (**<u>investment_type_id</u>**, investment_type_name)
- Investments (**<u>investment_id</u>**, *portfolio_id*, *transaction_id*, *telephone*, *investment_type_id*, investment_details, principal, rate, maturity_date)

1:1 Relationships:

- Accounts (**<u>account_id</u>**, *bank_id*, balance, date_created)
- Investment Portfolio (**<u>portfolio_id</u>**, total_assets_under_management)
    - Accounts (**<u>account_id</u>**, *bank_id*, balance, date_created, portfolio_id, total_assets_under_management)

- Risk Profile (**<u>profile_id</u>**, *telephone,* amount, reason_for_investment, source_of_deposit)
- Investments (**<u>investment_id</u>**, *portfolio_id, transaction_id*, *telephone*, *investment_type_id*, investment_details, principal, rate, maturity_date)
    - Investments (**<u>investment_id</u>**, portfolio_id, *transaction_id*, *telephone*, *investment_type_id*, reason_for_investment, investment_details, source_of_deposit, principal, rate, maturity_date)

1:1 Mandatory Participation Relationships:

- Clients (**<u>telephone</u>**, *employee_id*, email, address)
- Accounts (**<u>account_id</u>**, *bank_id*, *telephone,* balance, date_created, portfolio_id, total_assets_under_management)

Superclass/Subclass Relationships:

- Clients (**<u>telephone</u>**, *employee_id*, email, address)
    - Private Clients (**<u>telephone</u>**, first_name, last_name, date_of_birth)
    - Institutional Clients (**<u>telephone</u>**, institution_name)

Logical Tables

- Accounts (**account_id**, *bank_id*, *telephone*, balance, date_created, portfolio_id, total_assets_under_management)
- Clients (**telephone**, *employee_id*, email, address)
- Private Clients (**telephone**, first_name, last_name, date_of_birth)
- Institutional Clients (**telephone**, institution_name)
- Investments (**investment_id**, portfolio_id, *transaction_id*, *telephone*, *investment_type_id*, reason_for_investment, investment_details, source_of_deposit, *principal*, rate, maturity_date)
- Investment Type (**investment_type_id**, investment_type_name)
- Transactions (**transaction_id**, *account_id*, amount, transaction_date)
- Banks (**bank_id,** bank_name, bank_location)
- Employees (**employee_id**, *department_id*, first_name, last_name, date_of_birth, email, telephone, employment_date)
- Departments (**department_id**, department_name)

Link to Presentation Video: https://youtu.be/qQU8hxDVOko