NovaBank Currency Transfer System

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PL/SQL Final Practical Project

Introduction to NovaBank

NovaBank is a peer-to-peer web-based financial system designed to allow users to manage their funds with full control. It supports four currencies — FRW, USD, EUR, and KES — and offers core functionalities including manual deposit, withdrawal, money transfer, and transaction monitoring. The system ensures secure, real-time updates to user balances and performs currency conversions where necessary.

Description

NovaBank provides a seamless, real-time currency exchange and transaction system that enables users to transfer, withdraw, and monitor transactions efficiently.

Multi-Currency

Supports FRW, USD, EUR, KES transactions

Core Functionalities

- Deposits
- Withdrawals
- Transfers with conversion
- Track transactions

Security

Tracked and secured via procedures, triggers and packages

Problem Definition

Managing peer-to-peer transactions across different currencies is challenging. Users often struggle with manual conversions, high transfer fees, and delays in traditional banking systems.

Manual Conversion Issues

Users face delays and errors

Lack of Transparency

No real-time logs in traditional systems

Complex Cross-Currency Logic

Need for automated, auditable operations

Methodology – Tools & Technology

Oracle SQL Developer

PL/SQL, Triggers, Sequences

Entity-Relationship Modeling

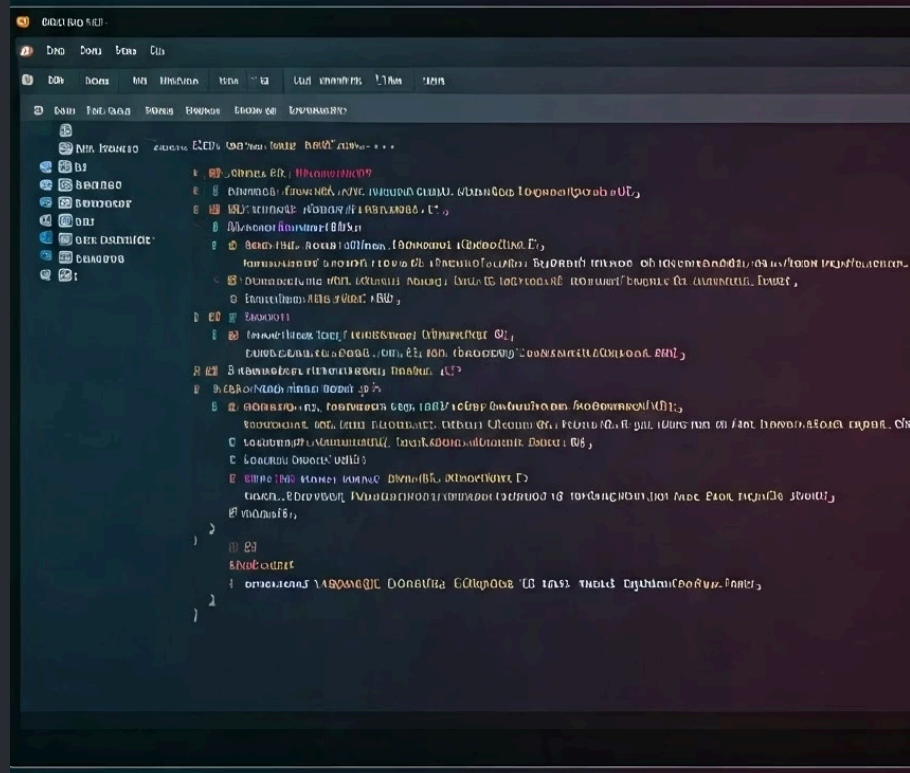
Conceptual and logical diagrams

Version Control

GitHub for code and docs

draw.io

System diagrams and flowcharts



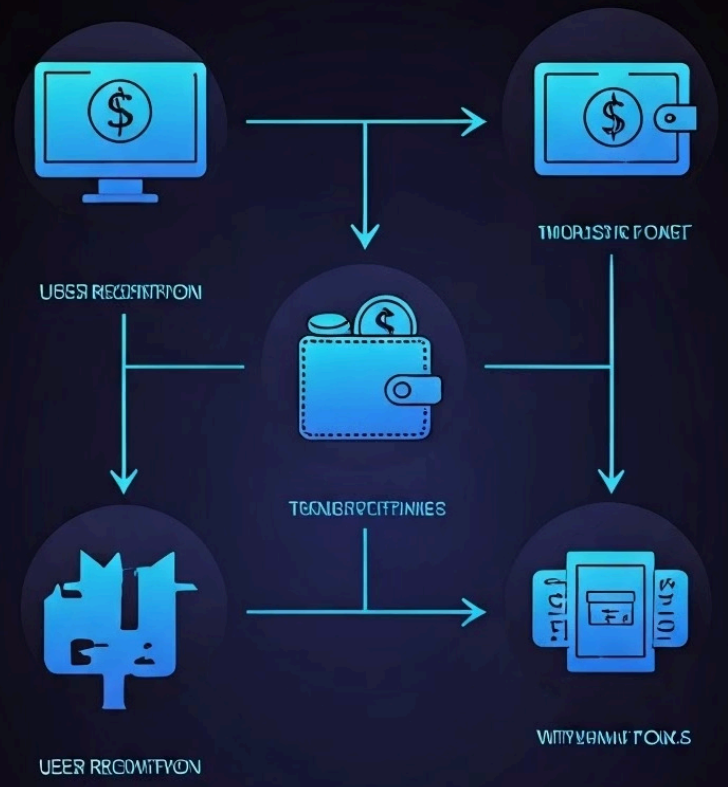
System Design – ERD Overview

Core Tables

- USERS
- ACCOUNTS
- TRANSACTIONS
- CURRENCIES
- EXCHANGERATE
- ACCOUNTS_LOG

Relations

- 1:N USERS to ACCOUNTS
- 1:N ACCOUNTS to TRANSACTIONS
- Auto-increment keys



System Flow and Processes

1

User Registration

Auto account creation via procedure

2

Deposits & Withdrawals

Balance update with logging

3

Transfers

Currency conversion, dual logging

4

Account Logging

Triggers capture all changes

Key Features

- **Real-Time Currency Conversion**

  Managed through EXCHANGERATES table

- **Full Transaction History**

  Stored in TRANSACTIONS table

- **Audit Logs**

  Account changes tracked with triggers

- **Validation**

  Prevents overdrafts, invalid inputs

Results & Validation

Working Backend

The project models a peer-to-peer financial system called PeerFlow that enables users to deposit, withdraw, and transfer money between accounts while supporting multiple currencies (FRW, USD, EUR, KES). The process involves user registration, account management, and secure transactions. Users can view a full transaction history, and currency conversion h

Procedure Testing

- Deposit
- Withdraw
- Transfer
- User profile display

Triggers

Accurately capture all balance updates

Packages

User account creation

Conclusion & Recommendations

Simple PL/SQL Solution

Effective for currency transfers and audits

Use Cases

- Student projects
- Training environments
- Startup MVPs

Future Work

- Add React or Flutter frontend
- Integrate real currency APIs
- Implement authentication/login

Thank You / Q&A

Questions?

Thank you for your attention!