SmartFin Organizational Income and Expense Tracking System

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Problem Statement

Organizations struggle with efficiently tracking income, expenses, employee roles, attendance, and managing financial activities across various projects. This manual process can result in financial mismanagement, reporting errors, and a lack of real-time insights into the organization's financial health.

1 Understanding of the Problem Statement

1.1 Explanation of the Problem Context

Organizations, especially large ones, often find it challenging to maintain an accurate and up-to-date view of their financial health. The intended users of this solution are organization managers, project operational managers (POMs), finance teams, and financial analysts. This platform will provide them with tools for efficient tracking, role-based access control, and actionable insights to enhance decision-making and streamline financial operations.

1.2 Key Requirements Identified

- Track income and expenses at an organizational and project level.
- Monitor project-specific financials, employee expenses, and attendance.
- Provide real-time financial analytics to support decision-making.
- Role-based access control for secure data handling.
- Streamlined financial reporting and compliance tracking.

2 Solution Overview

2.1 Solution Summary

The solution is a comprehensive financial management platform designed to track income, expenses, project costs, and employee-related expenses. It uses microservices for scalability, leverages real-time analytics, and offers role-based access to improve decision-making and operational efficiency.

2.2 Objective

This platform aims to improve financial tracking accuracy, enhance real-time decision-making, streamline reporting, and provide users with secure access tailored to their roles. The system is expected to reduce manual errors, improve data accuracy, and increase organizational transparency.

3 Features and Functionalities

3.1 Core Features

- Organization-level income and expense tracking.
- Project creation, budget management, and tracking.
- Employee details management, attendance tracking, and expense tracking.
- Real-time analytics with financial and attendance insights.
- Role-based access management.

3.2 Additional Features

- Flexible Reporting Formats (PDF, Excel, CSV).
- Role-Based Data Views with Fine-Grained Permissions.
- Audit Log for Financial Transactions and Changes.

3.3 User Flows

- **Income & Expense Entry:** Users enter income and expenses, categorized by project or general organization, and receive immediate financial summaries.
- **Project Setup & Budgeting:** POMs set up new projects, assign budgets, and can track expenses and budget utilization.
- **Employee Management & Attendance Tracking:** Admins manage employee details, assign roles, and track attendance, with expense reports updated automatically.
- **Reporting & Analytics:** Finance team and analysts generate reports, which provide insights into budgets, expenses, and overall financial health.

4 Architecture Diagram

4.1 System Architecture

A microservices-based architecture with the following components:

- Organization, Project, Employee, and Analytical microservices.
- Role Management service for access control.
- REST APIs for interaction between front-end and back-end.

4.2 Key Components

- **Organization Microservice:** Handle financial data, organization details, and global income/expense tracking.
- **Projects Microservice:** Manage project-specific budgets, expenses, and financial summaries.
- **Employee Microservice:** Track employee roles, attendance, expenses, and salaries.
- **Client Microservice:** Enable client creation and management, as well as linking clients to projects.
- **Finance Microservice:** Generate reports and analytics based on financial data.

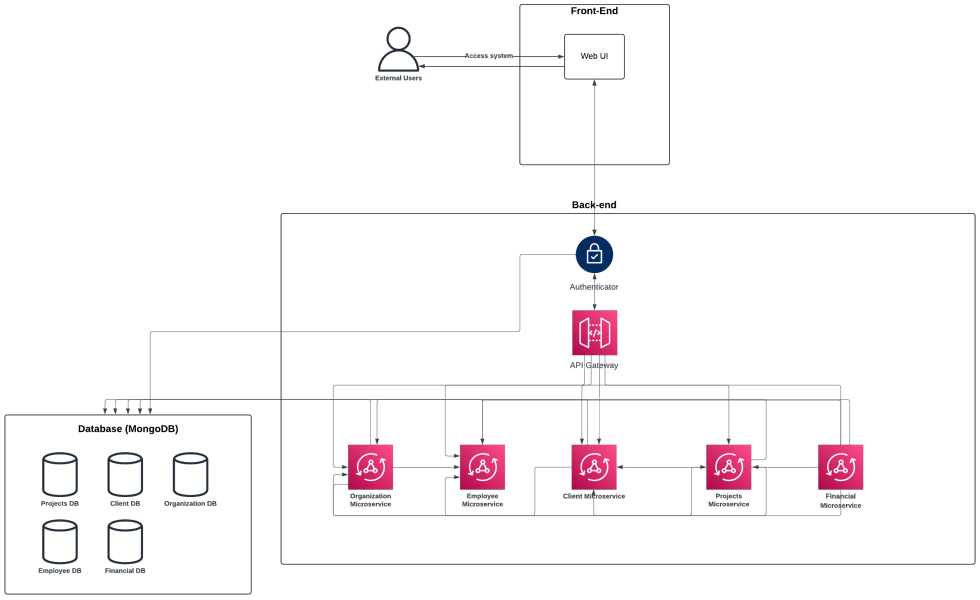

Figure 1: System Architecture Diagram

- **Authentication Microsrvice:** Provides secure user authentication and role-based access control.
- **Api Gateway:** Acts as a single entry point, routing requests and enforcing security across microservices.

5 Technical Stack

5.1 Frontend

React with TypeScript for a responsive user interface, utilizing reusable components for forms, dashboards, and reporting.

5.2 Backend

Node.js and TypeScript for handling server requests and providing RESTful APIs. Microservices architecture supports separation of concerns.

5.3 Database

MongoDB for managing non-relational data (financial and project details), ensuring scalability and flexibility in data storage.

5.4 Other Technologies and Tools

Chakra UI for frontend components, JWT for secure access, and Docker for containerization.

6 Prerequisites and Requirements

6.1 Technical Requirements

- Node.js environment for backend development.

- React development environment for frontend.
- Access to a MongoDB instance for data storage.

6.2 Data Requirements

- Sample financial data for testing.
- Employee, project, and attendance data for validation.

6.3 Access Permissions

- Git repository access for code collaboration.
- CI/CD pipeline setup for deployment.

6.4 Other Dependencies

Libraries for JWT (jsonwebtoken), Docker for containerization, and additional UI libraries.

7 Future Improvements

7.1 Planned Enhancements

- Real-time updates for budget thresholds, significant expenses, and attendance alerts.
- Facilitate secure payment processing for employee reimbursements and client payment
- Provide accurate currency conversions for international transactions.
- AI-driven expense categorization for smarter insights.

7.2 Scalability Considerations

- Cloud-based database scaling.
- Load balancing and microservices expansion to accommodate increased data and users.

8 Conclusion

8.1 Summary of Achievements

The solution successfully addresses key organizational financial challenges through efficient income and expense tracking, employee attendance management, and project budgeting. Real-time analytics improve decision-making accuracy and operational efficiency.

8.2 Value Provided

This system provides real-time financial insights, ensures budget adherence, and offers a secure, role-based platform for financial management, all of which are critical to achieving financial stability and operational excellence.

Attachments

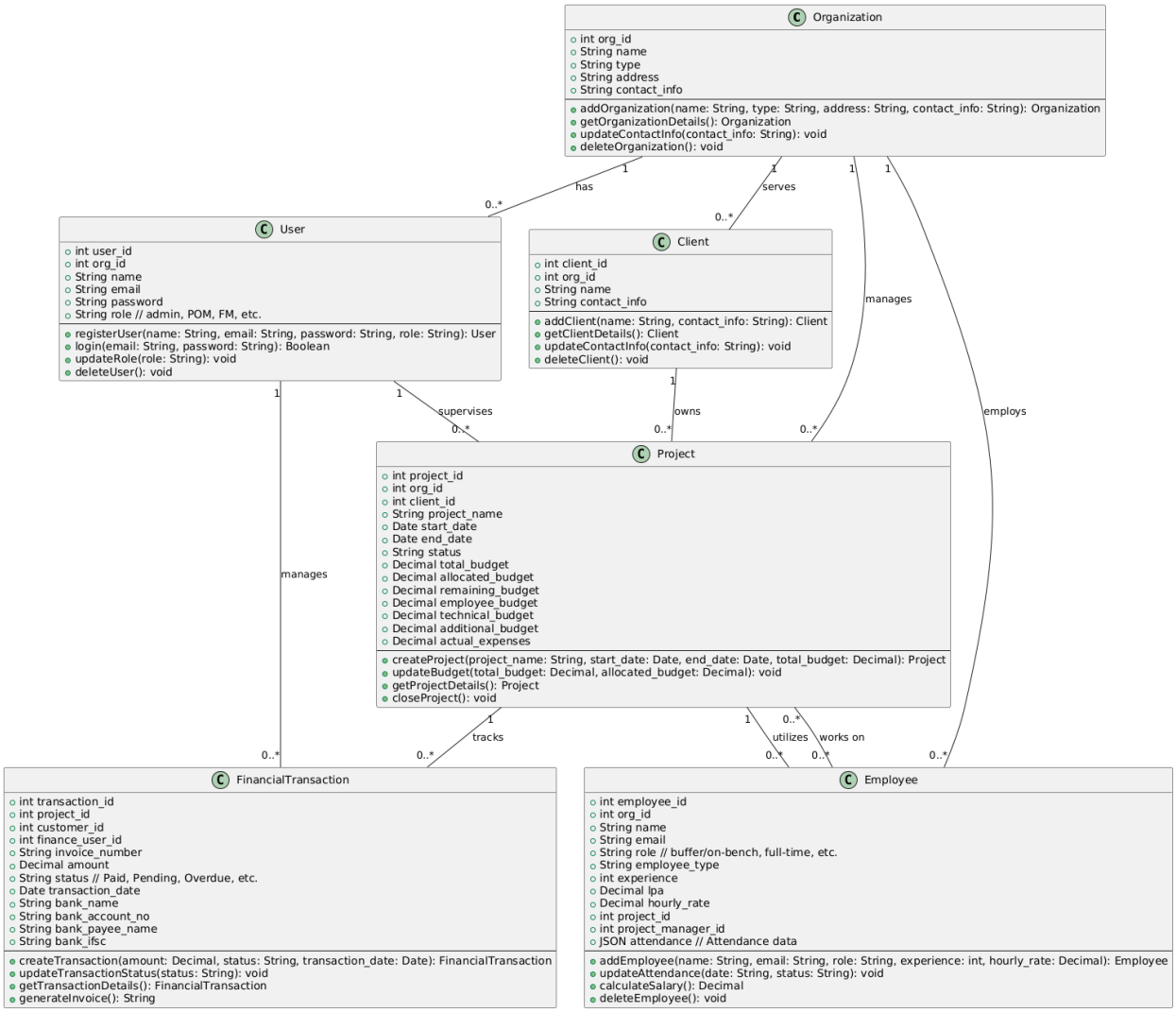

Figure 2: UML class diagram.

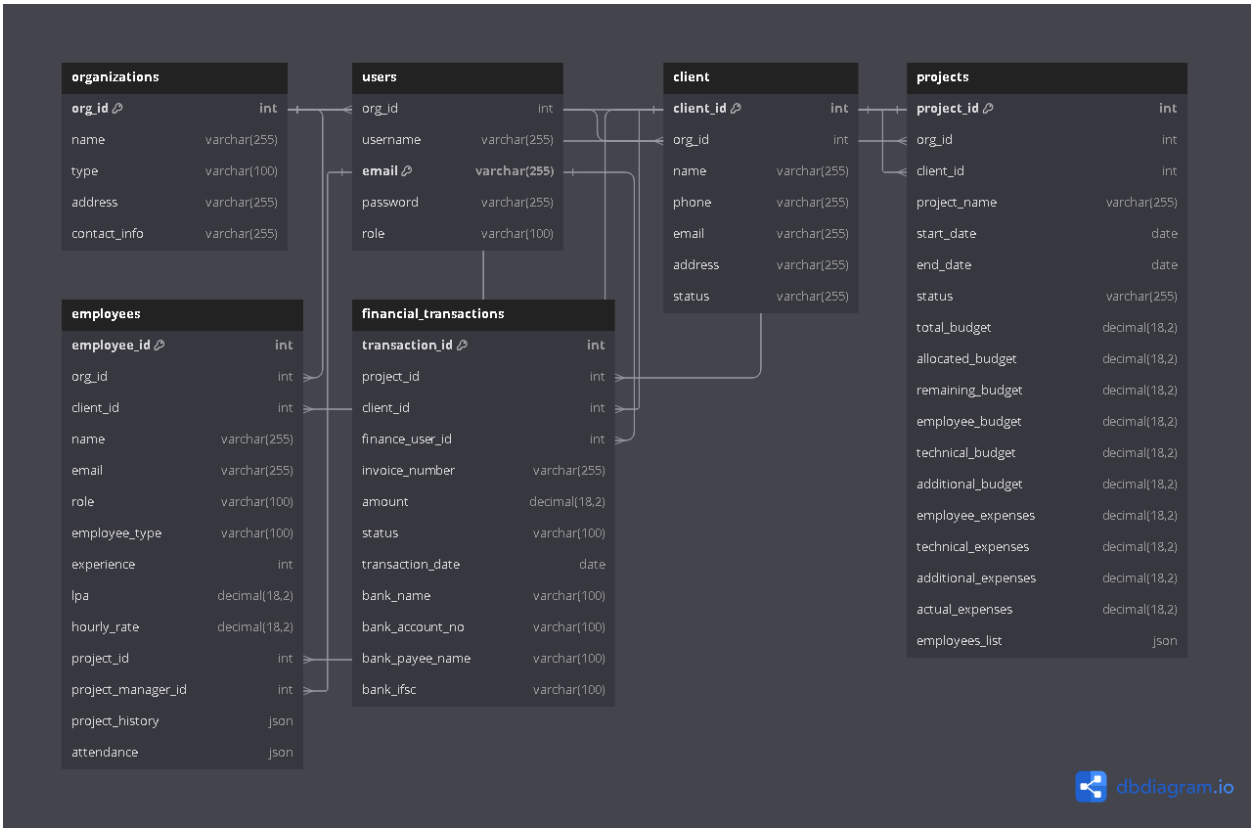

Figure 3: ER diagram.