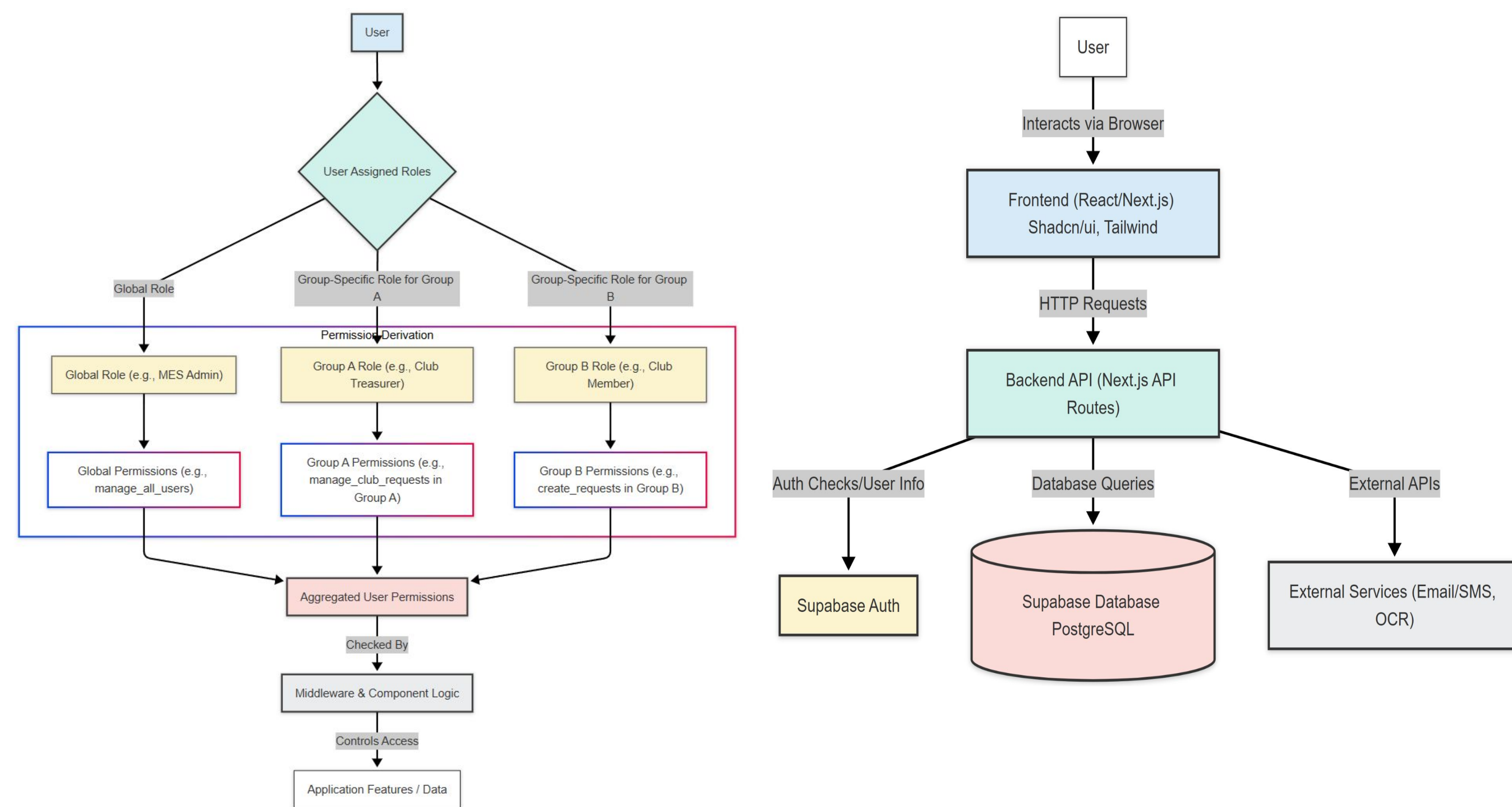


## Motivation

Student clubs within the McMaster Engineering Society (MES) face significant challenges in managing reimbursements, tracking budgets, and maintaining transparency due to outdated, manual processes involving spreadsheets and email chains. MES-ERP was developed in response to these inefficiencies, streamlining financial operations through a centralized web platform. Our system simplifies reimbursement workflows, enforces role-based access control, and provides real-time budget visibility, empowering clubs to operate independently yet cohesively. Designed with input from actual MES stakeholders, MES-ERP reflects the unique needs of student organizations and scales to support over 60 groups while maintaining security, usability, and transparency.

## Engineering Overview

### Component Diagrams



### User-Centric Design & Validation:

- **Real-World User Testing:** Incorporated insights gathered from external user testing sessions and a POC/Rev0 demonstration.
- **Feedback-Driven Features:** User testing directly led to key enhancements:
  - ◆ **OCR Receipt Scanning:** Added to eliminate tedious manual data entry from receipts.
  - ◆ **Analytics Dashboard:** Developed to provide visual spending reports for better budget management.
  - ◆ **Real-Time Input Validation:** Implemented to catch form errors proactively before submission.
- **Technical Validation:** Ensured code quality and component reliability through comprehensive unit testing using the Jest framework.

Professor: Dr. Spencer Smith

## Key Features

### Requests

Payment Requests

Budget Requests

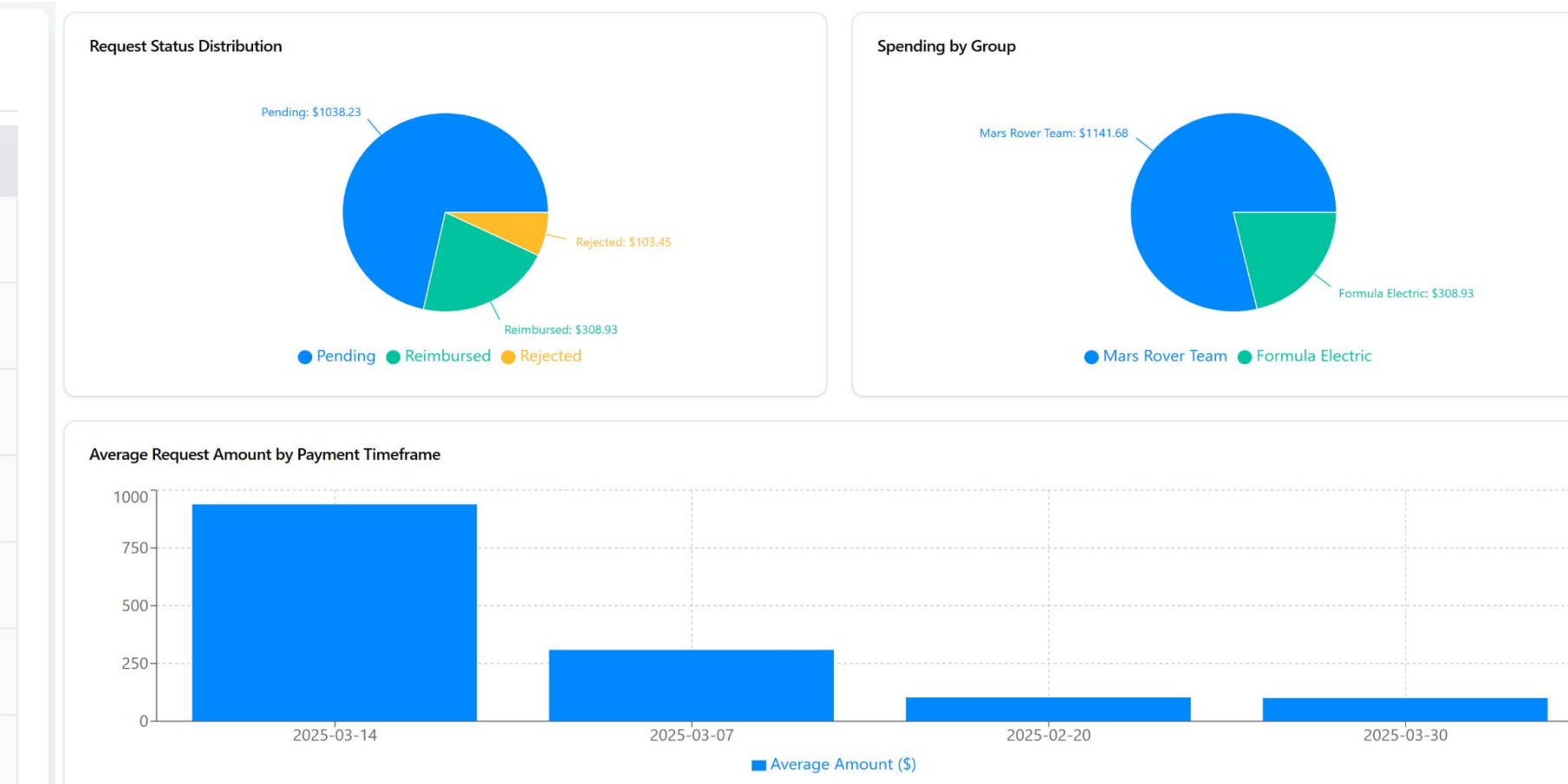
Create New Payment Request

Name	Role	Amount	Group	Timeframe	Type	Date	Status
Housam	MES Position	100	Mars Rover Team	2025-03-30	Reimbursement	30/03/2025, 14:51:50	Submitted
Noah Patel	Student Projects and New Club Seed Funding	103.45	Mars Rover Team	2025-02-20	Reimbursement	29/03/2025, 21:53:13	Rejected
Emily Fraser	Ratified Club, Team, or Program	308.93	Formula Electric	2025-03-07	Reimbursement	29/03/2025, 21:47:22	Reimbursed
Ethan Clarke	Ratified Club, Team, or Program	938.23	Mars Rover Team	2025-03-14	Reimbursement	29/03/2025, 21:44:42	Submitted

### Operating Budget

Mars Rover Team Total: 32000			
Label	Amount	Type	Actions
Clubs, Teams, and Program Societies Funding	5000	Income	Remove
MES Funding	11000	Income	Remove
Chassis Materials	5000	Expense	Remove
Electrical Components	6500	Expense	Remove
Sensors	2500	Expense	Remove
Travel Expenses	2000	Expense	Remove
+ Add Line			

### Analytics



### Users

User Management		
Email	Assigned Roles	Add Role
admin@mcmaster.ca	admin (Global)	No group (Glob) Select role + Add
pateln@mcmaster.ca	Budget & Reimbursements Officer in Mars Rover Team	No group (Glob) Select role + Add
fraser@mcmaster.ca	Treasurer in Formula Electric	No group (Glob) Select role + Add
clarke@mcmaster.ca	Reimbursement Coordinator in Mars Rover Team	No group (Glob) Select role + Add

### Groups

Group Management		
Create New Group		
Group Name	Members	Actions
Mars Rover Team	2	Remove
EcoCar	0	Remove
Formula Electric	2	Remove

### Roles

Role Management			
Create and manage roles with full permissions			
Create New Role			
Existing Roles			
Role Name	Scope	Groups	Actions
admin	Global	All groups	Remove Edit Add
Treasurer	Group Specific	Formula Electric	Remove Edit Add
Reimbursement Coordinator	Group Specific	Mars Rover Team	Remove Edit Add
Budget & Reimbursements Officer	Group Specific	Mars Rover Team	Remove Edit Add
Lead	Group Specific	EcoCar	Remove Edit Add

## Key Benefits

- **Streamlined Reimbursement Workflow:** Faster, error-reduced submission & tracking from initial request to final payment approval. (Addresses manual delays, lack of standard workflow)
- **Secure & Granular Access Control:** Role-based permissions (unique per group membership) ensure users only access relevant data and actions. (Addresses access control issues, security)
- **Real-Time Budget Management:** Instantly view group budget allocations and track spending against them via the integrated budget tool. (Addresses lack of visibility, budget tracking)
- **Actionable Financial Insights:** Analytics dashboard visualizes spending trends, request statuses, and budget utilization for informed decision-making. (Adds value beyond basic tracking)
- **Effortless Receipt Capture:** OCR automatically extracts key details from uploaded receipts, saving significant manual entry time. (Highlights a specific user-friendly feature)
- **Centralized Operations:** One reliable platform for all MES club financial requests, approvals, budget records, and user management. (Addresses fragmentation, record-keeping)

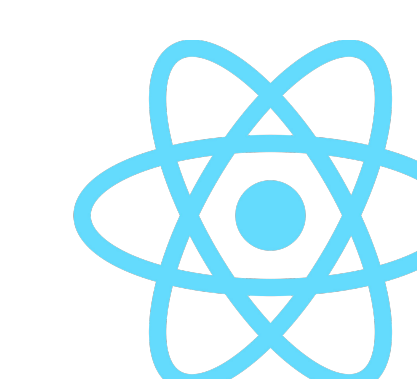
## Advanced Role-Based Access Control

- **Multi-Group Membership with Unique Roles:** Users can belong to multiple clubs/groups, holding distinct roles (Treasurer, Member) with different permissions within each group.
- **Granular, Role-Based Permissions:** Access to specific features and data (viewing requests, approving budgets, managing users) is strictly controlled by permissions assigned to roles (manage\_club\_requests, view\_all\_requests).

## Our Team

Housam Alamour, Software Engineering  
Omar Muhammad, Software Engineering  
Sufyan Motala, Software Engineering  
Taaha Atif, Software Engineering  
Rachid Khneisser, Software Engineering  
Access our site at: [macengsociety.ca/erp](https://macengsociety.ca/erp)

## Tools Used



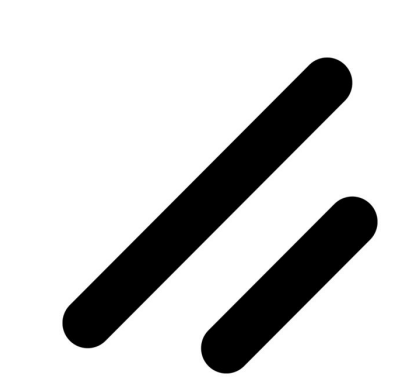
React



Next.js



Tailwind



Shadcn



Supabase

Supervisor: Luke Schuurman