RAG Front-End Design Document

# 1. Overview of the Application

## Purpose

The application provides an interface for a Retrieval-Augmented Generation (RAG) AI system. It allows users to upload, analyze, and retrieve insights from documents, chat with an AI assistant using context-aware queries, and manage organizational data like users and tenants.

## Key Features & User Goals

- Authentication via email/password and OAuth providers  
- Multi-tenant support with dynamic theming  
- File upload (local & cloud) and analysis  
- AI Chat interface with historical conversations  
- Admin panel for tenant and user management  
- Dashboard showing usage stats, credit consumption, and activity logs

# 2. Technology Stack

## Frameworks & Libraries

- React (UI framework) – Leaning towards Next instead  
- Redux Toolkit (State management)  
- React Router (Routing)  
- TailwindCSS (Styling)  
- Headless UI (Modal & transitions)  
- Heroicons (Icon set)  
- Recharts (Data visualization)

## Third-party APIs

- Google Drive / OneDrive for cloud file access  
- OAuth providers: Google, Microsoft, Apple

# 3. User Interface (UI) Design

## Page / Component Structure

- MainLayout: Base layout with header, sidebar, content  
- ChatLayout: Sidebar + Chat container  
- FileAnalysis: Connector, file list, and result viewer  
- Dashboard: Usage, credits, documents, activity  
- Auth: Login and Registration forms  
- Admin: Tenants and user management

## Component Responsibilities

- Auth Components: Handle user authentication and validation  
- File Components: Upload, list, analyze, and show results  
- Dashboard Components: Visualize platform usage  
- Chat Components: Conversation listing and messages  
- Common UI: Buttons, cards, loaders, empty states

## Styling & Responsiveness

- Fully styled using TailwindCSS  
- Dark/light theme toggle support via context  
- Mobile-responsive with breakpoints (sm, md, lg)  
- Accessibility support via semantic HTML and aria attributes

## UX Patterns

- Skeleton/loading states before data loads  
- Optimistic updates for UI responsiveness  
- Empty states with guidance for first-time users  
- Error messages shown inline for forms  
- Confirmation dialogs for destructive actions

# 4. Validation Plan

## Input Validation Rules

- Email: Required, valid email format  
- Password: Required, min 8 characters  
- Name: Required for registration  
- Confirm Password: Must match password

## Error Handling

- Form validation errors displayed inline  
- API errors handled via Redux rejected states  
- Global loading/error state per Redux slice

## Field Constraints

- Controlled components with internal state  
- Password fields hidden with autoComplete attributes  
- Cloud credential fields conditionally rendered by provider

# 5. UX Flow / User Journey

## Sequence of Screens

1. Login / Register  
2. Dashboard  
3. Chat or File Analysis  
4. Admin Panel (if applicable)

## Interaction Design

- Sidebar navigation  
- Chat selection opens thread  
- File selection opens results  
- Modals/dropdowns for tenant/cloud auth

## Feedback Mechanisms

- Loading spinners (LoadingIndicator)  
- Error messages from API  
- Visual indicators (e.g., colored icons for analysis status)

# 6. Reusability & Modularity

## Reusable Components

- <Card>, <Button>, <EmptyState>, <Avatar>  
- <PeriodSelector> for time range filters  
- Redux slices follow consistent async patterns

## Extending the System

- Add new chart types using Recharts  
- Expand cloud providers in CloudStorageConnector  
- Add new user roles in adminSlice

# 7. Assumptions & Limitations

## Assumptions

- User is always associated with a tenant  
- File analysis is asynchronous and may take time  
- API endpoints exist for all redux-thunk actions

## Limitations

- No offline support  
- Limited cloud provider support (Google, Microsoft only)  
- No support for custom branding beyond theme/colors

# 8. Screenshots or Wireframe Descriptions

## Sample Layouts

### Login Page

+-----------------------------+  
| Logo |  
| |  
| [ Full Name (if register) ]|  
| [ Email ] |  
| [ Password ] |  
| [ Confirm Password ] |  
| [ Login / Register Button ]|  
| [ Or Sign In with OAuth ] |  
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### Main Dashboard

+-- Sidebar --+----------------------------+  
| Dashboard | Usage Statistics |  
| Chat | Query Distribution Chart |  
| Files | Top Documents List |  
| Analytics | Recent Activity |  
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### Chat Layout

+-- Sidebar ----+--------------------------+  
| Chat Threads | Active Chat |  
| [ Chat 1 ] | [ AI ]: Hello! |  
| [ Chat 2 ] | [ User ]: Analyze file |  
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### File Analysis Page

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| Cloud Storage Connector |  
| [ Connect to Drive ] |  
| |  
| File List | Analysis |  
| ---------- | ----------- |  
| report.pdf | Summary |  
| budget.xls | Key Points |  
| ... | Entities |  
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