**Requirements Document**

**RAG AI Service Enhancement – File Integration, Tagging & Analysis**

**1. Overview**

This document outlines requirements for enhancing the AI Retrieval-Augmented Generation (RAG) service to support file uploads and cloud-based file mapping. Users will be able to select files from various storage providers, assign tags and categories (manually or with AI suggestions), and engage in contextual chat with the contents. It includes robust validation, a flexible GUI, Role-Based Access Control (RBAC), and collaborative tagging workflows.

**2. Goals**

* Upload or map external files (Google Drive, Dropbox, OneDrive, SharePoint)
* Authenticate securely via OAuth
* Enable file filtering and selection through the GUI
* Index content as snippets and metadata (default) or full text (optional)
* Support AI-assisted tagging, categorization, and searchability
* Allow chat interactions scoped to selected files
* Support file selection and querying from both chat interfaces
* Implement RBAC and multi-user collaboration on tagging and categorization

**3. Functional Requirements**

**3.1 File Integration UI ("File Analysis" Dashboard Menu)**

* **Location**: Available via the main navigation dashboard
* **Purpose**: File integration, tagging, categorization, contextual chat

**3.1.1 Cloud Storage Support**

* Providers:
  + Google Drive
  + **Dropbox**
  + Microsoft OneDrive (Azure)
  + Microsoft SharePoint (Azure)

**3.1.2 Secure Authentication via OAuth 2.0**

* Token handling using industry standards
* Permissions: Read-only access to user-specified files
* Secure token storage with refresh and expiration handling

**3.1.3 File Selection & Filtering**

* Folder and file browsing with:
  + Multi-select checkboxes
  + File-type filtering (e.g., PDF, DOCX, TXT, XLSX)
  + File metadata display (name, size, date modified)
  + Search and select-all options

**3.1.4 Upload vs. Map Modes**

* **Upload**: File content is stored in the internal knowledge base
* **Map**: File remains in external source and is re-indexed periodically
* Optional checkbox: “Store full content in vector DB for faster access”

**3.2 Tagging, Categorization, and Classification**

**3.2.1 Manual Tagging and Categorization**

* Users can assign:
  + **Tags** (e.g., invoice, policy, R&D)
  + **Categories** (e.g., Financial, HR, Legal, Technical)
* Tags and categories appear visually in the UI (color-coded pills or labels)
* Available as part of both upload and post-upload workflows

**3.2.2 AI-Suggested Tagging**

* Upon upload or mapping:
  + AI proposes tags based on file content, format, named entities, topics, etc.
  + Suggestions include confidence scores
  + Users can accept, reject, or modify AI-generated tags

**3.2.3 Multi-User Tagging Workflows**

* Multiple users can collaborate on file tagging
* Features:
  + Tag suggestions with audit trails
  + Review/approval queue for tags
  + Shared view of tags and categories with role restrictions

**3.3 Vector Database Indexing**

* Default: Index snippets + metadata
* Optional: Index full file content
* Indexed metadata includes:
  + File name
  + File type
  + Tags
  + Categories
  + Source system
  + Last modified date
  + Content location and snippet references

**3.4 Contextual Chat Integration**

**3.4.1 File Analysis Chat Page**

* Chat interface on the File Analysis screen
* Users can select files and engage in context-aware conversations
* Context is limited to selected files
* UI highlights sources for each chat response

**3.4.2 Main Dashboard Chat Integration**

* Typing a special command (e.g., @files) triggers:
  + File selector modal
  + Ability to include/exclude specific files
  + Persistent or session-based file context
* Slash commands:
  + /listfiles
  + /addfile [filename]
  + /removefile [filename]
  + /clearfiles

**4. Access Control (RBAC)**

* Role-Based Access Control system governs:
  + Who can upload, map, or remove files
  + Who can view, edit, or approve tags
  + Who can use AI-suggested tagging
  + Visibility of files across users and teams
* Role types (examples):
  + **Admin** – Full access
  + **Contributor** – Can upload, tag, and chat with files
  + **Reviewer** – Can approve/reject tags
  + **Viewer** – Read-only access to file metadata and chat

**5. Validation Plan**

| **Component** | **Validation Actions** |
| --- | --- |
| OAuth Integration | Secure, successful auth with token expiry handling |
| File Mapping | Directory listing with filtering and search |
| Upload & Storage Mode | File content handled based on user toggle |
| Snippet Indexing | Parsed accurately with proper metadata |
| AI Tagging | Relevant suggestions with confidence scoring |
| Chat with File Context | Responses cite correct file snippets |
| RBAC Permissions | Users restricted to allowed actions |

**6. UI/UX Considerations**

* Modern responsive interface (Tailwind or equivalent)
* File filters, dropdowns, modals, and tag visualizations
* Notifications:
  + Success/failure toasts
  + Tag suggestion alerts
* Consistency across dashboards and pages
* Tooltips and help text for onboarding

**7. Recommendations & Optional Features**

* **Webhook & Scheduled Sync**: For mapped files, keep content updated via webhook triggers or periodic re-scanning
* **Version History & Change Tracking**: Retain file revision metadata and reindex only changed portions
* **Audit Logs**: Track upload, tagging, chat, and access events
* **Admin Dashboard**:
  + View all mapped/uploaded files
  + Manage tags, categories, and user access
* **Tag Management System**:
  + Auto-merge duplicates
  + Global tag search
  + Suggested synonyms
* **AI Summary & Entity Extraction**:
  + On upload, generate file summary and identify entities (e.g., companies, products, people)
* **RBAC Management Panel**:
  + Assign roles to users
  + View permission breakdown
* **Language Support**:
  + NLP-driven translation at ingestion or retrieval time

**8. Future Enhancements**

* Integration with additional providers (e.g., Box, Dropbox Teams, NAS)
* AI-powered document clustering and topic modeling
* Full document analytics and dashboard reporting
* Chat memory to track references across sessions