**Main Dashboard Design Document**

**Overview**

The Main Dashboard is the primary landing page for the Airiam RAG Service, providing users with an at-a-glance overview of system usage, analytics, and recent activity. This central hub presents key metrics, visualizations, and navigation points to other parts of the application, offering users immediate insight into the performance and utilization of the RAG service.

This document outlines the functionality, design elements, and implementation details for the Main Dashboard. It provides developers with a clear understanding of components, interactions, and expected user experience. Each UI element is described with its purpose, behavior, and technical implementation details.

The Main Dashboard is designed to be information-rich yet easily digestible, presenting complex data through well-designed charts and statistics. It serves as both an analytics platform and a jumping-off point to the application's core functionalities, making it a crucial component of the overall user experience.

**Dashboard Components and Functionality**

**1. Header Section**

**Title and Time Range Controls**

* **Title**: Displays "Dashboard" in a prominent font (text-2xl, font-semibold)
* **Time Range Selector**:
  + Located in the top-right corner
  + Button group with options: Today, This Week, This Month, This Year
  + Currently selected range has highlighted styling
  + Changing selection updates all dashboard data
* **Refresh Button**:
  + Located next to time range selector
  + Icon button with refresh/rotate arrow icon
  + When clicked, refreshes all dashboard data
  + Shows loading state during refresh

**2. Statistics Cards Section**

**Usage Statistics Cards**

* **Layout**: Row of 4 equal-width cards that respond to screen size
* **Card Design**:
  + White background with subtle shadow
  + Icon in a colored circle
  + Statistic in large font
  + Label in smaller font
  + Consistent padding and height
* **Total Queries Card**:
  + Icon: Chat/message bubble
  + Metric: Count of total queries in the selected time period
  + Label: "Total Queries"
* **Total Files Card**:
  + Icon: Document
  + Metric: Count of total indexed files
  + Label: "Total Files"
* **Tokens Consumed Card**:
  + Icon: Token/coin
  + Metric: Count of total tokens used (formatted with commas)
  + Label: "Tokens Consumed"
* **Avg Response Time Card**:
  + Icon: Clock/timer
  + Metric: Average response time in seconds
  + Label: "Avg Response Time"

**3. Analytics Charts Section**

**Credit Consumption Chart**

* **Container**: Card with header and content sections
* **Title**: "Credit Consumption"
* **Chart Type**: Line chart showing trend over time
* **X-Axis**: Dates within the selected time range
* **Y-Axis**: Credit amount
* **Interaction**: Hover tooltip showing exact values
* **Responsiveness**: Chart should resize with container

**Query Distribution Chart**

* **Container**: Card with header and content sections
* **Title**: "Query Distribution"
* **Chart Type**: Bar chart showing categories
* **X-Axis**: Query categories (e.g., Financial, Technical, Legal)
* **Y-Axis**: Query count
* **Interaction**: Hover tooltip showing exact values
* **Responsiveness**: Chart should resize with container

**4. Top Documents Section**

**Top Documents Card**

* **Container**: Card with header and content sections
* **Title**: "Top Documents"
* **Content**: Table of most accessed documents
* **Columns**:
  + Document (name with icon)
  + Type (file extension)
  + Access Count (number of times referenced)
* **Empty State**: Message when no documents have been accessed
* **Scrollable**: If more than 5-10 documents (depending on screen size)

**5. Recent Activity Section**

**Activity Log Card**

* **Container**: Card with header and content sections
* **Title**: "Recent Activity"
* **Content**: Timeline of user activities
* **Activity Types**:
  + file\_upload: When files are uploaded
  + file\_delete: When files are deleted
  + conversation\_create: When conversations are created
  + conversation\_message: When messages are sent
  + login: User login events
  + logout: User logout events
* **Activity Format**:
  + Icon representing activity type
  + Username who performed the action
  + Description of the action
  + Timestamp
  + Connector lines between activities
* **Empty State**: Message when no activity has been recorded

**6. Loading and Error States**

**Loading Indicators**

* **Initial Load**:
  + Skeleton loading state for each section
  + Progress indicators in appropriate locations
* **Refresh Load**:
  + Subtle loading indicators that don't block the UI
  + Spinner on the refresh button

**Error Handling**

* **Connection Errors**:
  + Error message when data can't be fetched
  + Retry button to attempt reload
  + Offline indicator if no connection
* **Data Errors**:
  + Fallback display when data is invalid
  + Error boundaries to prevent complete UI failure

**Testing Procedures**

**1. Header Section Testing**

**Title Display Test**

* Verify that "Dashboard" is displayed in the header with the correct styling

**Time Range Control Testing**

1. **Selection Test**:
   * Click each time range option (Today, This Week, This Month, This Year)
   * Verify the selected option is highlighted
   * Verify all dashboard data updates to reflect the selected time range
2. **Default Selection Test**:
   * Load the dashboard fresh
   * Verify "This Week" is selected by default (or the configured default)
3. **Persistence Test**:
   * Select a different time range
   * Navigate away from the dashboard and back
   * Verify the previously selected range remains active

**Refresh Button Testing**

1. **Click Response Test**:
   * Click the refresh button
   * Verify loading indicators appear
   * Verify data refreshes without requiring page reload
2. **Visual Feedback Test**:
   * Click the refresh button
   * Verify the button shows a loading state (spinner, disabled appearance)
   * Verify the button returns to normal state after refresh completes

**2. Statistics Cards Testing**

**Layout Testing**

1. **Responsive Layout Test**:
   * Resize browser window to different widths
   * Verify cards reflow appropriately:
     + Desktop: All 4 cards in one row
     + Tablet: 2x2 grid
     + Mobile: Stacked vertically
2. **Card Content Test**:
   * Verify each card displays the correct icon
   * Verify metric numbers match the expected format
   * Verify labels are displayed correctly

**Data Accuracy Testing**

1. **Time Range Impact Test**:
   * Change time range selection
   * Verify metrics update and reflect the correct time period
   * Look for significant outliers that may indicate calculation errors
2. **Data Format Test**:
   * Verify large numbers have appropriate formatting (commas, abbreviations)
   * Verify time values have correct units (seconds, ms)

**3. Analytics Charts Testing**

**Credit Consumption Chart Testing**

1. **Rendering Test**:
   * Verify the chart appears with correct axes and line
   * Verify the line color matches design specifications
   * Verify grid lines are visible but subtle
2. **Interaction Test**:
   * Hover over data points
   * Verify tooltip appears with date and value
   * Verify tooltip is correctly positioned
3. **Time Range Impact Test**:
   * Change time range selection
   * Verify chart updates with new date range on x-axis
   * Verify data points reflect the selected time period

**Query Distribution Chart Testing**

1. **Rendering Test**:
   * Verify the chart appears with correct axes and bars
   * Verify the bars have appropriate colors and spacing
   * Verify category labels are readable
2. **Interaction Test**:
   * Hover over bars
   * Verify tooltip appears with category and count
   * Verify tooltip is correctly positioned
3. **Empty State Test**:
   * If possible, test with no query data
   * Verify appropriate empty state is displayed

**4. Top Documents Testing**

**Table Content Testing**

1. **Data Display Test**:
   * Verify document names are displayed correctly
   * Verify document types match the actual file types
   * Verify access counts appear to be accurate
   * Verify sorting is by access count (descending)
2. **Row Limit Test**:
   * If pagination is implemented, test page navigation
   * If scrolling is implemented, test scroll behavior
3. **Empty State Test**:
   * If possible, test with no document access data
   * Verify appropriate empty state is displayed

**5. Recent Activity Testing**

**Timeline Testing**

1. **Activity Display Test**:
   * Verify activities are listed in chronological order (newest first)
   * Verify each activity shows correct icon, username, description, and time
   * Verify timeline connectors are displayed correctly
2. **Activity Types Test**:
   * Verify each activity type has the appropriate icon and color
   * Perform various actions (upload file, create conversation, etc.)
   * Verify new activities appear in the timeline
3. **Timestamp Format Test**:
   * Verify recent activities show relative time (e.g., "5 minutes ago")
   * Verify older activities show appropriate date format
4. **Empty State Test**:
   * If possible, test with no activity data
   * Verify appropriate empty state is displayed

**6. Loading and Error State Testing**

**Loading State Testing**

1. **Initial Load Test**:
   * Clear cache and reload the page
   * Verify skeleton loaders or loading indicators appear
   * Verify smooth transition from loading to loaded state
2. **Partial Load Test**:
   * Simulate slow network conditions
   * Verify sections load independently (if implemented)
   * Verify UI remains usable while parts are still loading

**Error Handling Testing**

1. **Network Error Test**:
   * Disconnect internet connection
   * Refresh the dashboard
   * Verify appropriate error messages appear
   * Reconnect and verify retry functionality works
2. **API Error Test**:
   * Modify API to return errors (in testing environment)
   * Verify error boundaries catch and display errors properly
   * Verify other parts of the dashboard still function
3. **Empty Data Test**:
   * Test with completely empty dataset
   * Verify all sections handle empty data gracefully