

1 User Lands on Platform (ENTRY POINT)

What Happens

- User opens the web application
- Public landing page is shown

User Options

- Login
- Register

Why This Comes First

- Security
- Personal workspace
- Access control

📌 Modules Involved

- Frontend Auth UI
 - Backend Auth API
-

2 User Authentication (SECURITY GATE)

Flow

User → Login/Register → JWT Issued → Session Created

What Happens

- Credentials validated
- JWT token issued
- Token stored in browser
- Token attached to all future requests

📌 Important Rule

No user can access documents without authentication

3 User Dashboard (CONTROL CENTER)

What User Sees

- List of their documents
- Create new document button
- Recent activity

What Happens in Backend

- Fetch documents by `user_id`
- Activity logged

📌 Purpose

- Central navigation point
 - Ownership clarity
-

4 Document Creation / Selection (WORKSPACE SETUP)

Two Paths

A) Create New Document

- User enters title & category
- Document metadata saved

B) Open Existing Document

- Latest version fetched

📌 Key Point

Document content is loaded from the **latest saved version**

5 Join Real-Time Collaboration Session (CORE STEP)

Flow

```
User opens document
  ↓
Joins SignalR Group (doc_id)
  ↓
Real-time channel established
```

What Happens

- SignalR connection starts
- User added to document group
- Other users notified of presence

📌 Why This Is Critical

- Enables live collaboration
 - Isolates document sessions
-

6 Real-Time Editing (MAIN FUNCTIONALITY)

Flow

```
User edits content  
↓  
Editor generates delta  
↓  
SignalR Hub  
↓  
Broadcast to other users
```

What Happens

- Local editor updates instantly
- Other users see changes live
- Typing indicators shown

📌 Design Principle

No full document reload — only delta sync

7 Inline Commenting (COLLABORATION SUPPORT)

Flow

```
User selects text  
↓  
Adds inline comment  
↓  
Comment stored with offsets  
↓  
Visible to collaborators
```

Why This Exists

- Context-based discussion

- No external chat needed
-

8 Versioning (SAFETY NET)

Two Triggers

- Auto-save every 10 minutes
- Manual “Finalize Document”

Flow

```
Live document
  ↓
Snapshot saved
  ↓
New version created
```

📌 Explain to Team

Live edits are temporary; versions are permanent.

9 Version History & Revert (RECOVERY)

Flow

```
User opens version history
  ↓
Selects version
  ↓
Document restored
```

Important Rule

- Revert creates a **new version**, not overwrite
- 📌 Prevents data loss
-

10 Activity Logging (BACKGROUND PROCESS)

What Is Logged

- Login

- Document creation
- Edits
- Comments
- Version saves

Why

- Audit
 - Debugging
 - Admin tracking
-

Logout / Session End

What Happens

- JWT cleared
- SignalR disconnected
- User removed from document group