**Project 13:**

**Digital E-Signature Platform - Data Modelling**

# What is Data Modelling?

In MongoDB, data modeling means designing collections and documents in a way that supports your app’s logic, query needs, and performance. For a Digital E-Signature Platform, this includes users, documents, signatures, audit trails, etc.

# Project Context: Digital E-Signature Platform

## Identify Collections

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| --- | --- |
| **Collection** | **Purpose** |
| **users** | All registered users: Admins, Signatories, Document Owners |
| **documents** | Stores uploaded documents with metadata and version control |
| **signatures** | Stores signature data for users per document |
| **audit\_logs** | Tracks every document-related action for traceability |
| **notifications** | Manages email alerts, reminders, and system messages |
| **templates** | Predefined document templates like NDAs, contracts |
| **sessions** | 2FA sessions or biometric/IP authentication metadata |

## Define Relationships

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **#** | **Relationship** | **Type** | **Description** | **Field Reference / Modeling** | **Justification** |
| **1** | User ↔ Documents | One-to-Many | One user can upload many documents | documents.ownerId → users.\_id | Reference: Large documents, avoid embedding |
| **2** | Document ↔ Signatures | One-to-Many | Each document can have many signature entries (multi-sign) | signatures.documentId → documents.\_id | Reference: Needed for tracking signature flow |
| **3** | User ↔ Signatures | One-to-Many | A user can sign multiple documents | signatures.userId → users.\_id | Reference: Efficient to query per user |
| **4** | Document ↔ Audit Logs | One-to-Many | Every action on a document is recorded | audit\_logs.documentId → documents.\_id | Reference: Logs may grow large |
| **5** | Document ↔ Notifications | One-to-Many | Each document may have many alerts and reminders | notifications.documentId → documents.\_id | Reference: Decouples alerts |
| **6** | User ↔ Notifications | One-to-Many | Users receive alerts | notifications.userId → users.\_id | Reference |
| **7** | Document ↔ Templates | Many-to-One | Document may be based on a template | documents.templateId → templates.\_id | Reference |
| **8** | User ↔ Sessions | One-to-One/Many | 2FA or biometric/IP validation metadata | sessions.userId → users.\_id | Reference or Embed if session is short-lived |

## Embed vs Reference

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| --- | --- |
| **Use Case** | Recommended Modeling |
| **Audit logs for document actions** | Reference |
| **Signature data** | Reference |
| **Document metadata & versions** | Embed versioning |
| **Session/2FA details** | Embed or reference |
| **Notifications per document/user** | Reference |