Project Plan: MongoDB

Database II (NoSQL) — DHBW Stuttgart

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February 2026

Abstract. This document defines the scope, structure, responsibilities, and timeline for the course project on MongoDB. The project delivers (i) a MongoDB implementation of a migrated chat-application schema, (ii) a recorded presentation / movie, and (iii) an eBook chapter for the course NoSQL eBook.

Contents

1 Project Overview

1.1 Project Title

MongoDB Implementation of a Chat Application Schema

1.2 Goal of the Project

This project explores MongoDB as a document-oriented NoSQL database solution. We migrate and analyze a chat application database schema originally designed for relational databases to demonstrate MongoDB's capabilities, advantages, and use cases.

1.3 Context

The course deliverables are:

- A recorded presentation / movie about MongoDB.
- An eBook chapter covering MongoDB concepts, design, installation, examples, and evaluation.
- A MongoDB implementation of the migrated schema (plus a relational baseline for comparison).

1.4 Scope and Deliverables

The project implements the database of a chat application with the following logical entities:

- **Users**: user accounts and authentication data
- **Groups**: chat groups / channels
- **Group Members**: relationship between users and groups
- **Chat Messages**: messages sent within groups
- **Files**: file attachments shared in conversations

1.5 Baseline and Target Data Model

Figure 1 shows the relational schema used as baseline. Figure 2 shows the derived MongoDB schema / collection design.

2 Planned Structure of the Deliverables

2.1 Presentation / Movie Structure

1. Type of Database & History
2. Improvements over Relational DB Design
3. DB Design (Advantages / Disadvantages)
4. Test Examples (Using Former SQL Project)
5. Query Performance & Indexing
6. API
7. Advantages and Disadvantages (ecosystem, usage tiers, ...)
8. CAP Theorem Analysis
9. Conclusion

2.2 eBook Chapter Structure

1. Type of Database & History
2. Improvements over Relational DB Design
3. DB Design (Advantages / Disadvantages)

4. Installation (process, requirements, challenges)
5. Test Examples (Using Former SQL Project)
6. Query Performance & Indexing
7. API
8. Advantages and Disadvantages (ecosystem, usage tiers, ...)
9. CAP Theorem Analysis
10. Conclusion
11. References (APA style)

3 Team and Responsibilities

Erik	• Creating the project structure and README
Simon	• Converting relational database schema to MongoDB
Ognjen	• Conducting general literature research
Kevin	• Creating the milestones / time plan for the project
To be determined	• Assignment of topics for the presentation / movie and eBook chapters • Organize filming the presentation / movie • Cutting and editing the raw material

4 Project Timeline and Milestones

Table 1 lists the agreed milestones and target dates.

Table 1: Milestones and due dates

#	Milestone	Due date	Key tasks
1	Create project structure	17.02.2026	• Take the example project structure and refine it with own ideas • Think about and discuss the topics in relation to our project
2	Define topics for the presentation / movie and eBook chapters	17.02.2026	• Select topics that are a better fit for the presentation / movie or eBook chapters
3	Convert relational database schema to MongoDB	18.02.2026	• Take a relational database schema from a former project and convert it
4	Assign topics for presentation / movie and eBook chapters to team members	20.02.2026	• Let team members choose topics based on their interests and expertise
5	Film raw material for presentation / movie	05.03.2026	• Plan and film the presentation / movie

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#	Milestone	Due date	Key tasks
6	Complete literature research	05.03.2026	• Search through the DHBW Stuttgart online library, google scholar and other databases and sources for scientific books and papers
7	Cut and edit raw material for presentation / movie	10.03.2026	• Take the raw material and create the final presentation / movie out of it
8	Create eBook chapters	26.03.2026	• Take the sources found in the literature research and write about the defined topics
9	Review eBook chapters	02.04.2026	• Every team member reviews the content, citation of sources and formatting of an eBook chapter of another team member • The team members can then discuss the eBook chapters

5 Schema Appendix

5.1 Relational Baseline Schema

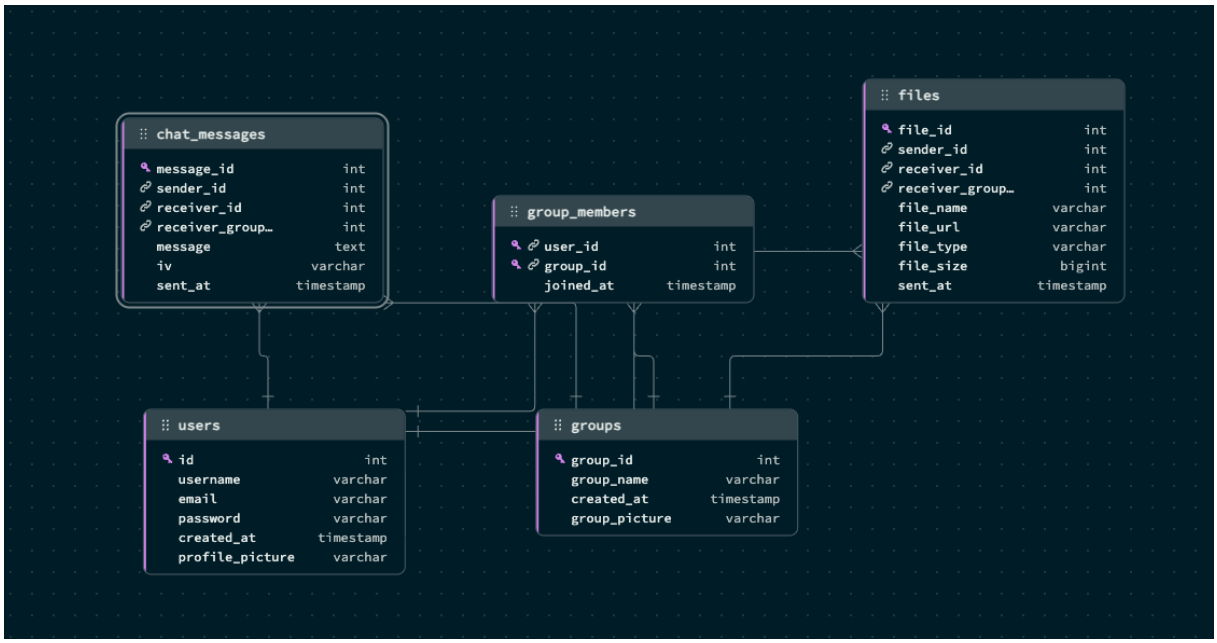

Figure 1: Relational schema used as baseline for the migration

5.2 MongoDB Collection Design

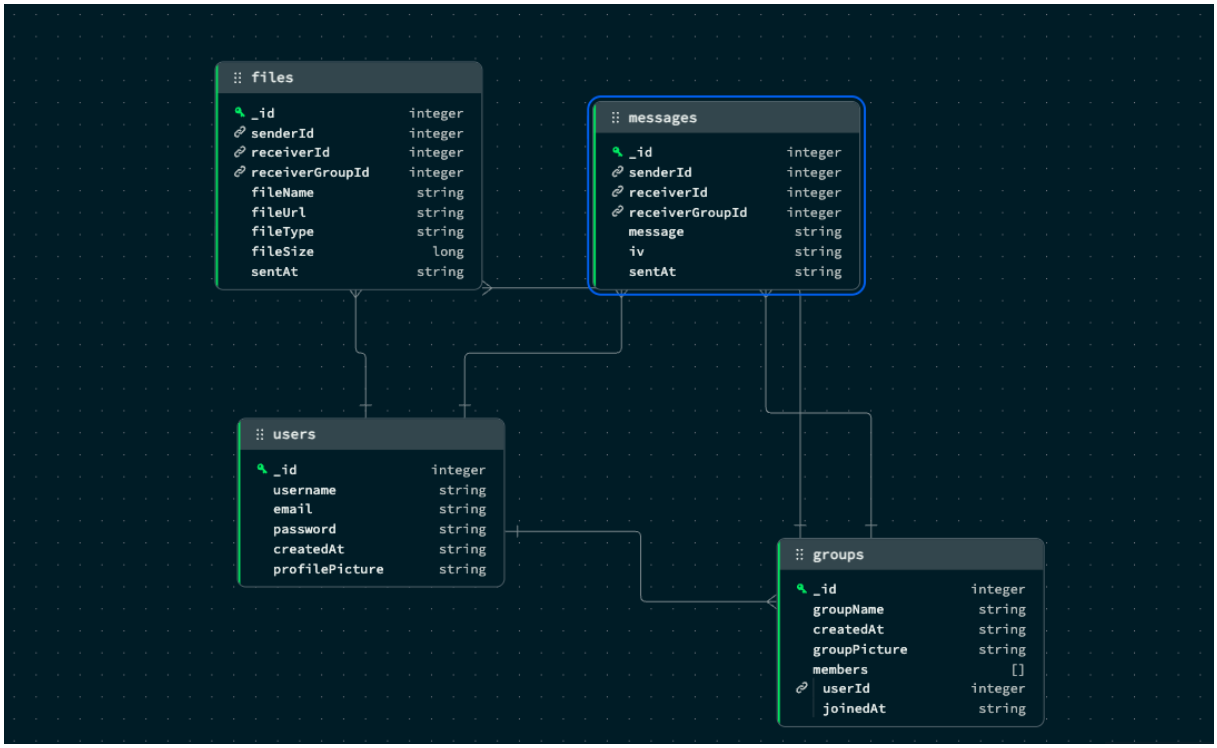

Figure 2: MongoDB schema / collection design derived from the relational baseline