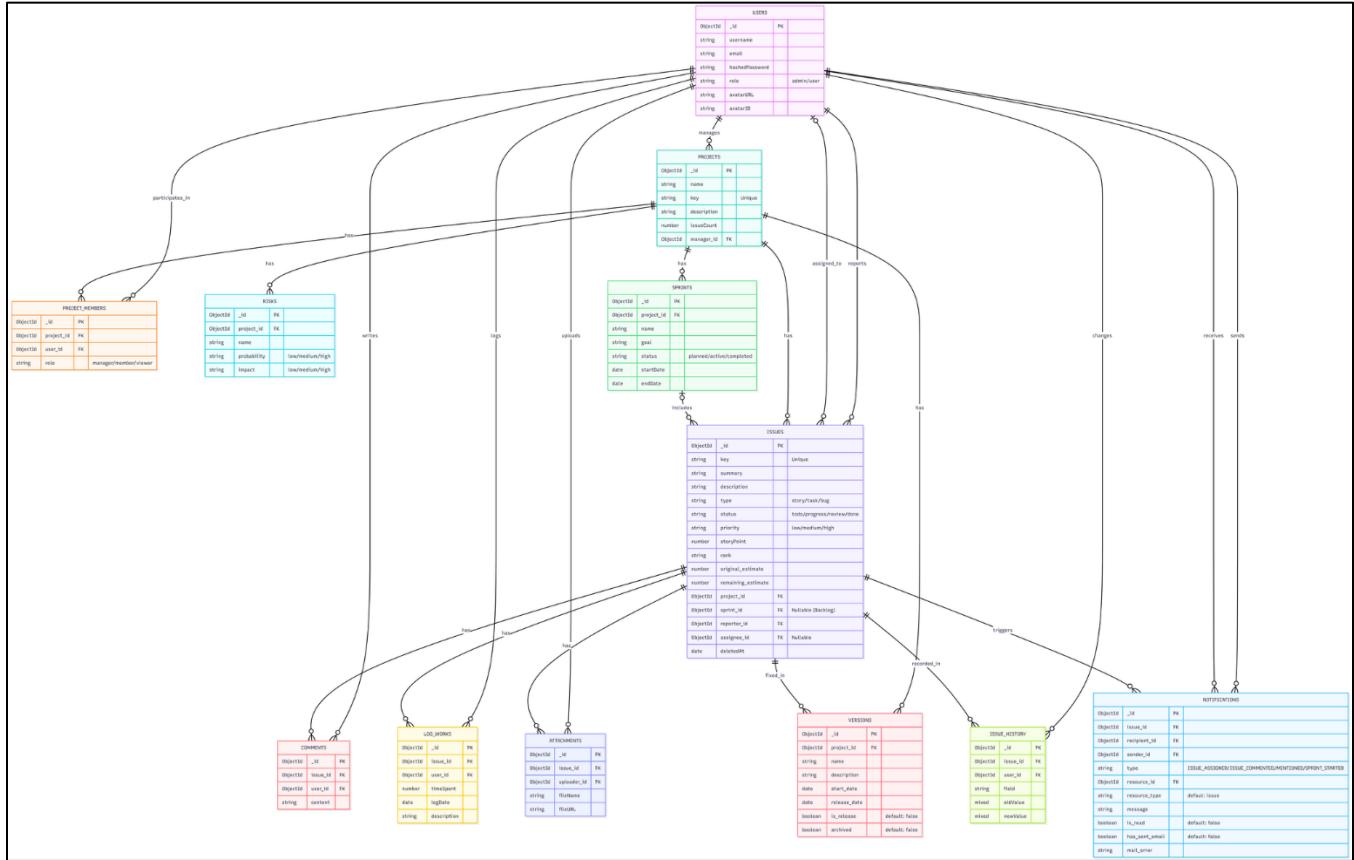


# 4 Data Design

## 4.1 Data Diagram



Picture: Data Diagram

## 4.2 Data Specification

### USERS

Attribute	Type	Constraint	Description
<b>_id</b>	ObjectId	Primary Key	User ID
<b>username</b>	String	required, unique, lowercase, trim	Account
<b>hashedPassword</b>	String	required	Hash password

<b>email</b>	String	required, unique, lowercase, trim	Email user
<b>avatarURL</b>	String	optional	Avatar URL
<b>avatarID</b>	String	optional	Avatar ID
<b>role</b>	String	enum("user", "admin"), default="user"	User role
<b>createdAt</b>	Date	auto	Creation date
<b>updatedAt</b>	Date	auto	Update date

## PROJECTS

Attribute	Type	Constraint	Description
<b>_id</b>	ObjectId	PK	
<b>name</b>	String	required	Project name
<b>key</b>	String	required, unique	Project key
<b>description</b>	String	optional	
<b>manager</b>	ObjectId	required, <i>FK → Users._id</i>	Manager
<b>issueCount</b>	Number	default: 0	Number of issue
<b>createdAt</b>	Date	auto	
<b>updatedAt</b>	Date	auto	

### PROJECT\_MEMBERS

Attribute	Type	Constraint	Description
<b>_id</b>	ObjectId	PK	
<b>project</b>	ObjectId	required, <i>FK → Projects._id</i>	
<b>user</b>	ObjectId	required, <i>FK → Users._id</i>	
<b>role</b>	String	enum("manager", "member", "viewer")	Role in project
<b>createdAt</b>	Date		
<b>updatedAt</b>	Date		

### RISKS

Attribute	Type	Constraint
<b>_id</b>	ObjectId	PK
<b>project</b>	ObjectId	required, <i>FK → Projects._id</i>
<b>name</b>	String	required
<b>probability</b>	String	enum("low", "medium", "high")
<b>impact</b>	String	enum("low", "medium", "high")
<b>createdAt</b>	Date	
<b>updatedAt</b>	Date	

## SPRINTS

Attribute	Type	Constraint
<code>_id</code>	ObjectId	PK
<code>project</code>	ObjectId	required, $FK \rightarrow Projects._id$
<code>name</code>	String	required
<code>goal</code>	String	optional
<code>startDate</code>	Date	optional
<code>endDate</code>	Date	optional
<code>completedAt</code>	Date	optional
<code>status</code>	String	enum("planned", "active", "completed")
<code>createdAt</code>	Date	
<code>updatedAt</code>	Date	

## ISSUES

Attribute	Type	Constraint	Description
<code>_id</code>	ObjectId	PK	
<code>project</code>	ObjectId	$FK \rightarrow Projects._id$	
<code>summary</code>	String	required	Title
<code>key</code>	String	required, unique	Key issue (JIRA-123)
<code>description</code>	String		
<code>type</code>	String	enum("story", "task", "bug")	
<code>status</code>	String	enum("todo", "in_progress", "review",	

		"done")	
<b>priority</b>	String	enum("low","medium","high")	
<b>storyPoint</b>	Number	default: 0	
<b>rank</b>	String	optional	
<b>reporter</b>	ObjectId	<i>FK → Users._id</i>	
<b>assignee</b>	ObjectId	<i>FK → Users._id</i> , optional	
<b>originalEstimate</b>	Number	default 0	
<b>remainingEstimate</b>	Number	default 0	
<b>sprint</b>	ObjectId	<i>FK → Sprints._id</i> , optional	
<b>fixVersion</b>	ObjectId	<i>FK → Versions._id</i>	
<b>deletedAt</b>	Date	soft delete	
<b>createdAt</b>	Date		
<b>updatedAt</b>	Date		

### COMMENTS

Attribute	Type	Constraint
<b>_id</b>	ObjectId	PK
<b>issue</b>	ObjectId	required, <i>FK → Issues._id</i>
<b>user</b>	ObjectId	required, <i>FK → Users._id</i>
<b>content</b>	String	required
<b>createdAt</b>	Date	
<b>updatedAt</b>	Date	

**LOG\_WORKS**

Attribute	Type	Constraint
<b>_id</b>	ObjectId	PK
<b>issue</b>	ObjectId	required, <i>FK → Issues._id</i>
<b>user</b>	ObjectId	required, <i>FK → Users._id</i>
<b>timeSpent</b>	Number	required
<b>logDate</b>	Date	default: now
<b>description</b>	String	optional
<b>createdAt</b>	Date	
<b>updatedAt</b>	Date	

**ATTACHMENTS**

Attribute	Type	Constraint
<b>_id</b>	ObjectId	PK
<b>issue</b>	ObjectId	required, <i>FK → Issues._id</i>
<b>fileName</b>	String	required
<b>fileURL</b>	String	required
<b>uploader</b>	ObjectId	<i>FK → Users._id</i>
<b>createdAt</b>	Date	
<b>updatedAt</b>	Date	

## ISSUE\_HISTORY

Attribute	Type	Constraint
<code>_id</code>	ObjectId	PK
<code>issue</code>	ObjectId	required, $FK \rightarrow Issues._id$
<code>user</code>	ObjectId	required, $FK \rightarrow Users._id$
<code>field</code>	String	required
<code>oldValue</code>	Mixed	
<code>newValue</code>	Mixed	
<code>createdAt</code>	Date	
<code>updatedAt</code>	Date	

## NOTIFICATIONS

Attribute	Type	Constraint
<code>_id</code>	ObjectId	PK
<code>recipient</code>	ObjectId	$FK \rightarrow Users._id$
<code>sender</code>	ObjectId	$FK \rightarrow Users._id$
<code>type</code>	String	enum("ISSUE_ASSIGNED", "ISSUE_COMMENTED", "MENTIONED", "SPRINT_STARTED")
<code>resourceId</code>	ObjectId	required
<code>resourceType</code>	String	default "issue"
<code>message</code>	String	
<code>isRead</code>	Boolean	default false
<code>hasSentEmail</code>	Boolean	default false

<b>mailError</b>	String	optional
<b>createdAt</b>	Date	TTL index 30 days
<b>updatedAt</b>	Date	

## VERSIONS

Attribute	Type	Constraint
<b>_id</b>	ObjectId	PK
<b>project</b>	ObjectId	required, <i>FK → Projects._id</i>
<b>name</b>	String	required
<b>description</b>	String	
<b>startDate</b>	Date	
<b>releaseDate</b>	Date	
<b>isReleased</b>	Boolean	default false
<b>archived</b>	Boolean	default false
<b>createdAt</b>	Date	
<b>updatedAt</b>	Date	