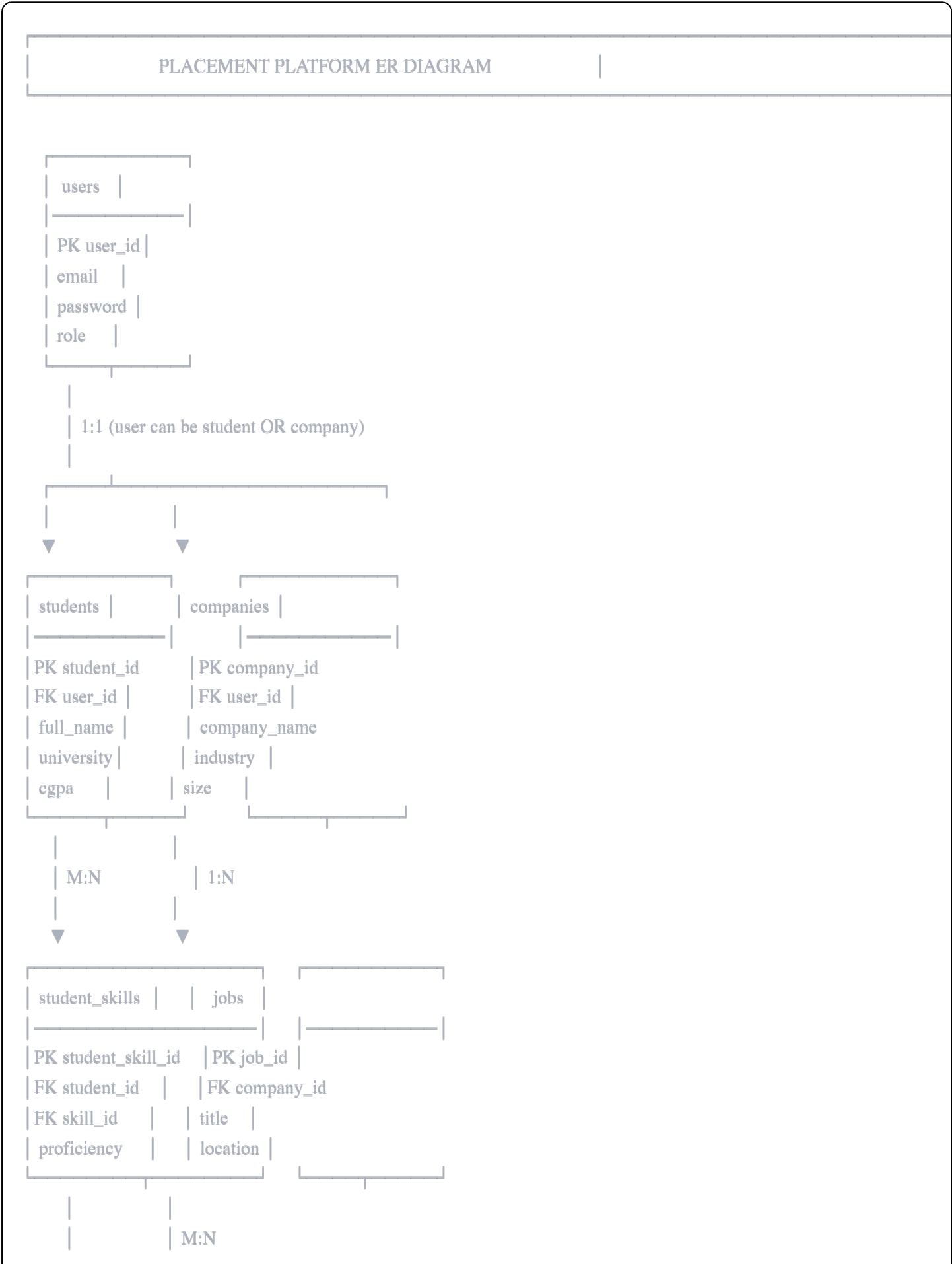
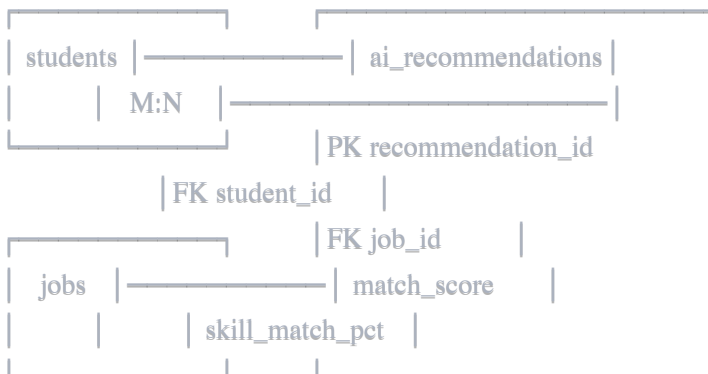
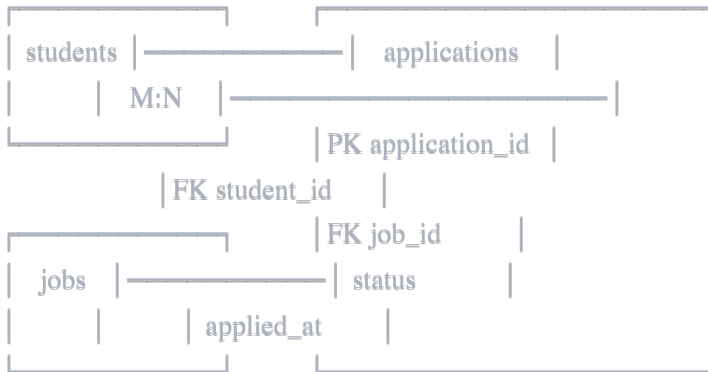
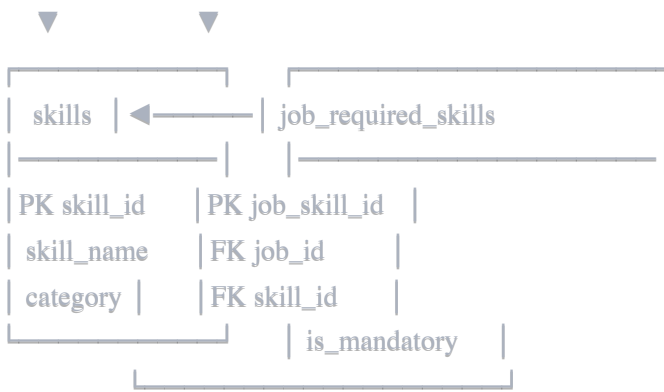


Entity-Relationship Diagram Documentation

Tables and Relationships





Relationship Summary

Relationship	Type	Description
users → students	1:1	One user can have one student profile
users → companies	1:1	One user can have one company profile
companies → jobs	1:N	One company posts many jobs
students ↔ skills	M:N	Via student_skills junction table
jobs ↔ skills	M:N	Via job_required_skills junction table
students ↔ jobs (applications)	M:N	Via applications junction table
students ↔ jobs (recommendations)	M:N	Via ai_recommendations table

Normalization Proof

First Normal Form (1NF) ✓

- All columns contain atomic values
- No repeating groups (skills are in separate table, not comma-separated)
- Each table has a primary key

Second Normal Form (2NF) ✓

- Already in 1NF
- No partial dependencies (all non-key columns depend on entire primary key)
- Junction tables only contain FKs and relationship-specific attributes

Third Normal Form (3NF) ✓

- Already in 2NF
- No transitive dependencies
- Example: company_name is in companies, not duplicated in jobs

Key Design Decisions

1. **Separate users table:** Authentication concerns are isolated
2. **Skills as master table:** Enables normalization and analytics
3. **Junction tables with attributes:** student_skills has proficiency, job_required_skills has is_mandatory
4. **MongoDB references:** resume_mongo_id and jd_mongo_id link to document store
5. **AI recommendations in SQL:** Structured output from AI is stored relationally for querying