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Datalogical Modelling Sample

Relational Databases Basics

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Disclaimer (yes, its similar to the one you've seen recently)

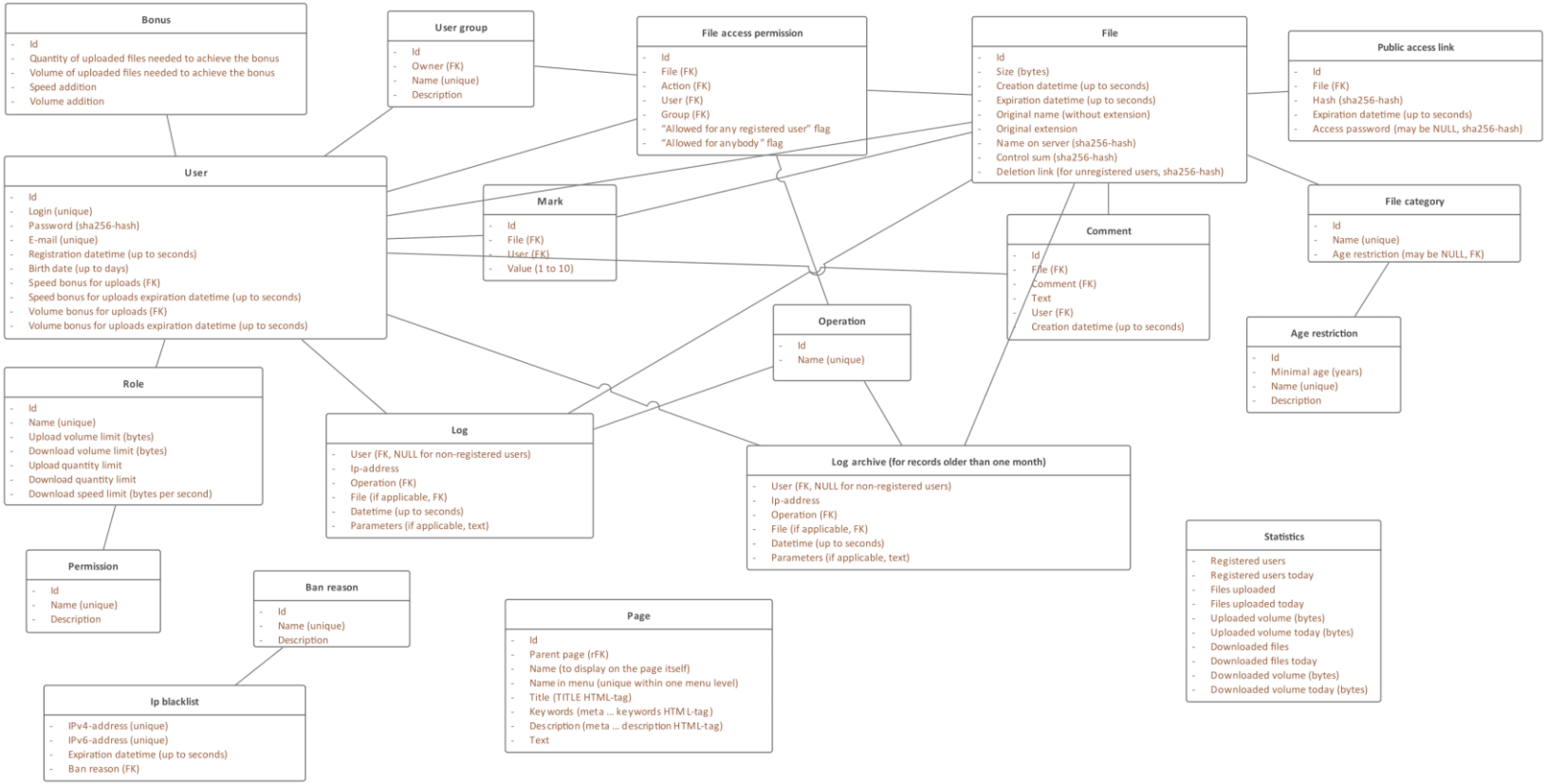
In real life this is a LONG iterative process. It may take days and months. And even here (with this extremely simplified sample) you'll have to spend a lot of time in order to comprehend all the information.

Just a quick reminder on the initial setup

We are working on the database for the “File Exchange” service. Here is the info from the customer:

1. The application may contain several pages (the quantity, the hierarchy, and the contents may vary).
2. Application users may create groups and join such groups.
3. Each user may have several roles with a set of permissions for each role.
4. Uses may upload and download files, share files with specific users, groups of users, and the whole world.
5. Users may comment files.
6. Each file has a rating.
7. There may be replies to comments (and other replies) – up to 10 levels of nesting depth.
8. Each file must belong to a category, which determine the set of permissions and limitations.
9. The application shall log all actions of all users.
10. There must be possibility to ban users, groups of users, and non-registered users (by ip address).
11. The application shall display (with minimum time delay) the following statistics: total users, total uploaded files quantity and volume, total downloaded files quantity and volume.

And that was the result of infological modelling



DBMS convention

1. DBMS type: relational.
2. Particular DBMS: MySQL (community edition).
3. Minimal DBMS version: 8.0.
4. DBMS infrastructure details: standalone server.

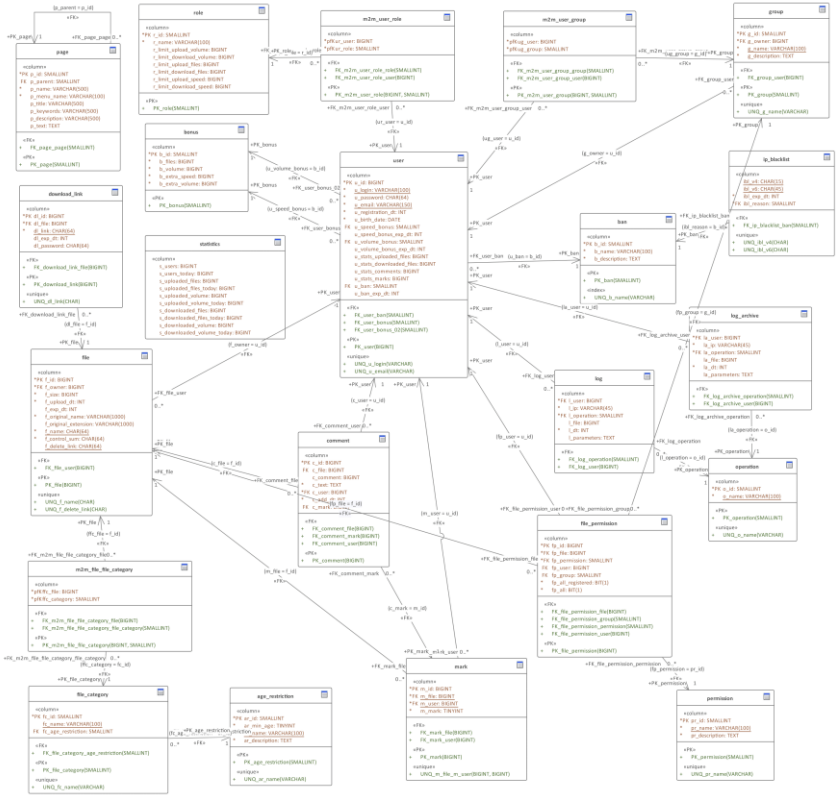
DB convention

1. Structures naming:
   a. All table and field names must be lowercase only.
   b. Word separator in table and field names must be “_” only.
   c. Nouns in table names must be in singular form only (e.g., “file”, NOT “files”). Nouns in field names may be un plural form (still its not recommended).
   d. Field names must have prefixes composed with beginning table name letters.
   e. All unique constraint names must have “UNQ_” prefix, and must contain all corresponding fields names.
   f. All trigger names must have “TRG_”, and must contain the table name and triggering event name.
2. SQL code formatting:
   a. All SQL keywords must be in uppercase.
   b. All structure names must be enclosed in “`” symbols.
3. Comments principles:
   a. All database structures mut have a comment.
4. Other specifics (like API, and so on):
   a. All datetime fields must be of INTEGER type and store UNIXTIME-values.
   b. All date fields must be of DATE type.
   c. All primary keys must be surrogate, auto-increment, unsigned.

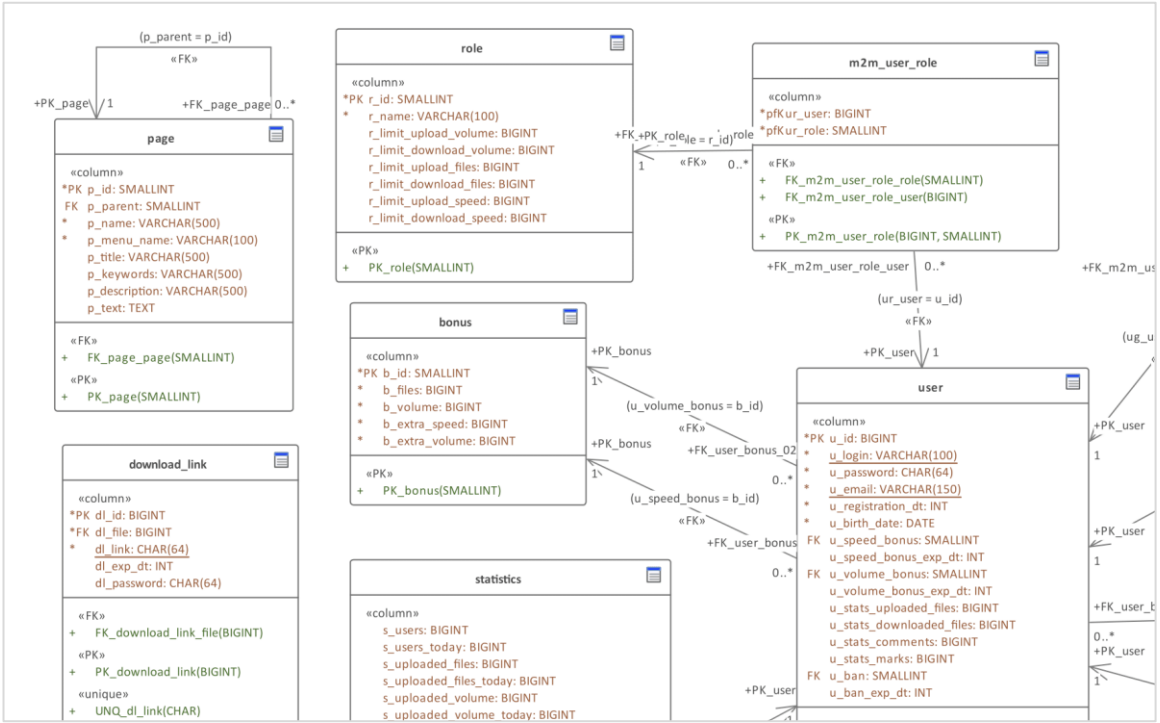
In rare cases we may have additional intermediate step

Table	Field	Data type	Comment
…			
Public access link	Id	INTEGER	PK
	File	INTEGER	FK
	Hash	CHAR64	Link value, SHA256-hash
	Expiration datetime	INTEGER	Up to seconds
	Access password	CHAR(64)	SHA256-hash, NULL if no password set
…			

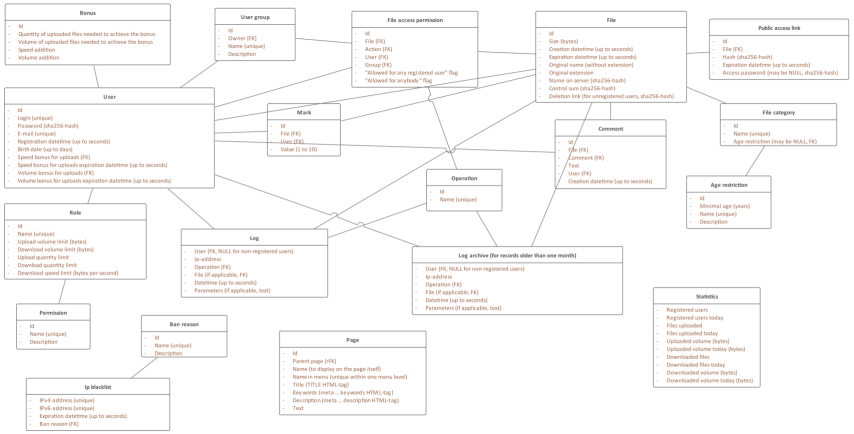
Finally, we have the following result



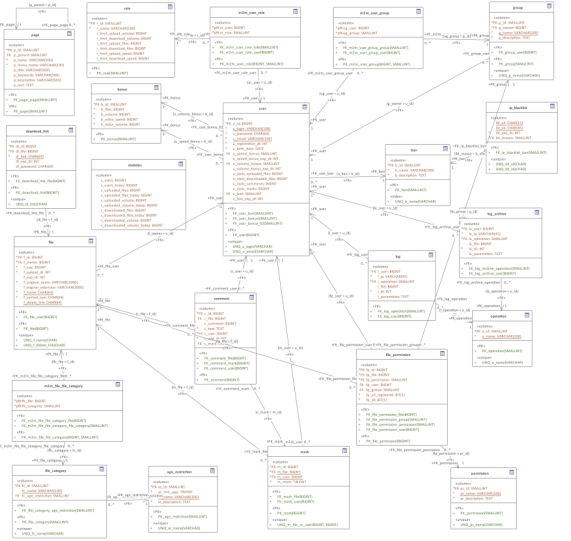
Enlarged fragment



Please, don’t!



Automatic



Quick live demo…

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