THE CITY LIBRARY

CS 631

Data Management System Design

Deliverable 1

Project By:

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1. Goal for this phase of the project

To define the relationship between the various entities and the attributes which are used in the City library database using an Entity-Relationship model incorporating data and functional requirements.

2. Entity Relationship Diagram

- **Entity Type :**

- Regular entity Types: Branch, Library, Reader, Document, Publisher, and Chief Editor, Online Catalogue, Journal Issue
- Superclass/Subclasses: Document , Books, Journal Volume, Conference proceedings

- Relationship Types :

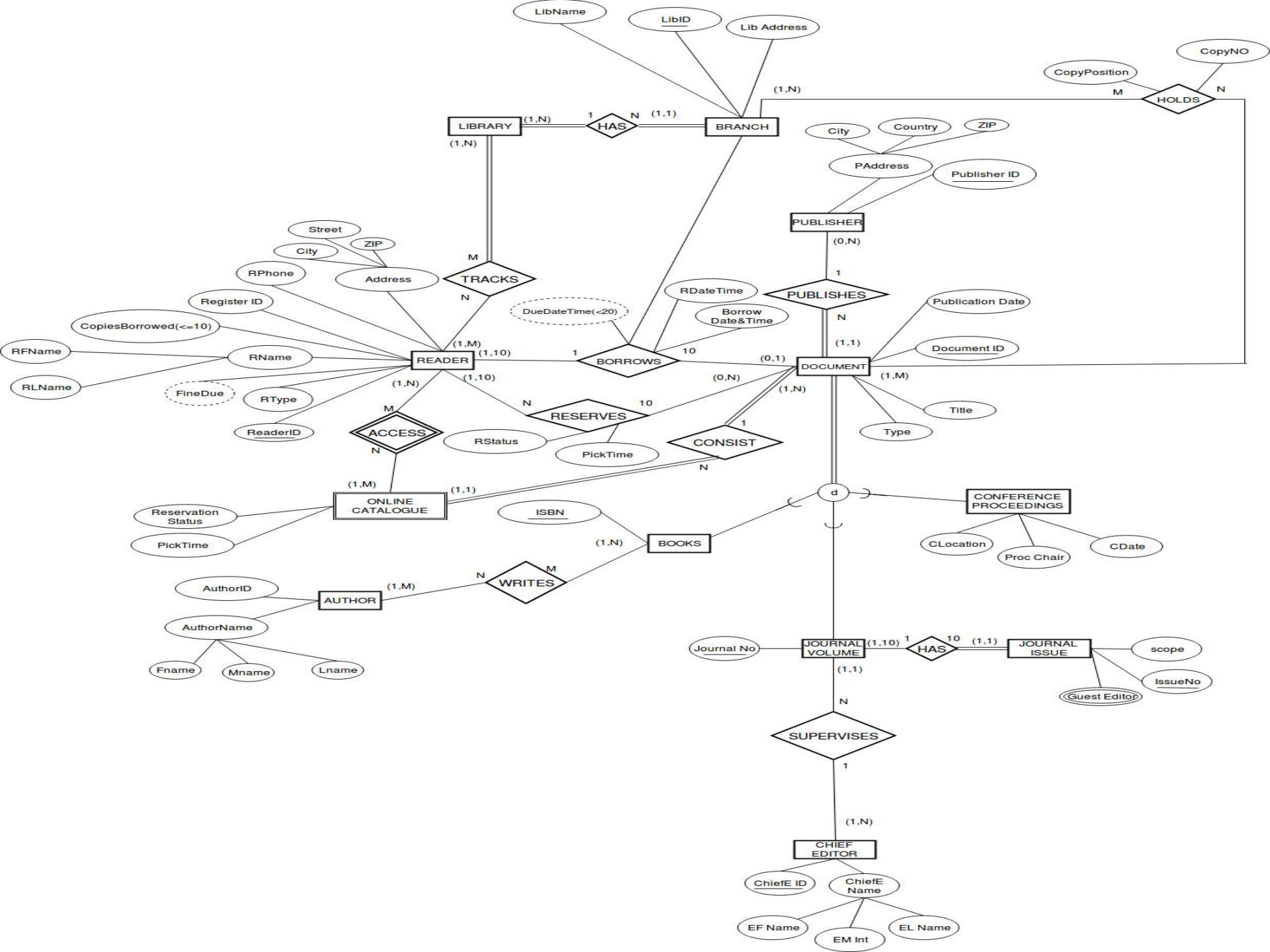
- Reader BORROWS Document from a Branch. (Ternary Relation).
- Reader RESERVES Document. (One-to-Many(10))
- Library HAS Branch (One-to-Many)
- Library Tracks Reader (Many-to-Many)
- Publisher PUBLISHES Document.(One-to-Many)
- Reader Access Online Catalogue.(Many-to-Many)
- Document Consists of Online Catalogue
- Journal Volume is supervised by Chief Editor.(One-to-Many)
- Journal Volume HAS Journal Issues. (One-to-Many(10))
- Branch Holds copies of Documents. . (Many-to-Many(10))

- **Composite attributes:**

- READER [{Name} – RF Name, RL Name]
- READER [{Address} – City, Country, Zip]
- BOOK [{Author Name} - Fname, Mname, Lname]
- CHIEF_EDITOR[{Chief Name} – EF Name, EM INT, EL Name]
- PUBLISHER [{PAddress} - City, Country, Zip]

- **Stored and Derived Attributes:**
- In the BORROWS relationship type, Borrow Date Time acts as a stored attribute and Due DateTime acts as a derived attribute which derives its value from Borrow Date Time.
- In the READER entity 'FineDue' is a derived attribute which derives its value from Borrow Date Time and Return Date Time.

- **Multivalued Attributes:**
- 'GuestEditor' in Journal_Issue entity is a multivalued attribute as one Journal Issue has more than one Guest Editors.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RName
RLName
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1
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CHIEF EDITOR
ChiefE ID
ChiefE Name
EF Name
EM Int
EL Name

3. Assumptions

1. The reader may or may not borrow the document from the library.

2. The reader may or may not reserve the document from the library.

3. **Composite Attributes** : Publisher and Reader Address, Chief Editor Name, Author Name, Reader Name,

4. **Primary Key** : Chief Id, Reader Id, ISBN, Issue Number, Document ID

4. Constraints And Additional Keys

- **Constraints**

- A journal volume can have journal issues up to 10.

- A reader cannot borrow more than10 documents.

- Document can be borrowed for maximum 20 days.

- **Required Primary Key**

- Chief Id, Reader ID, Lib ID, Publisher ID, Issue Number, ISBN, Journal Number, Document ID,

5. Difficulties :

During conceptual designing of City Library Database System, We faced difficulties in:

1) Deciding secondary entities(hidden in textual contents).

2) Defining relationships between few entities.

3) Defining structural constraints(Cardinalities and Participation Constraints).