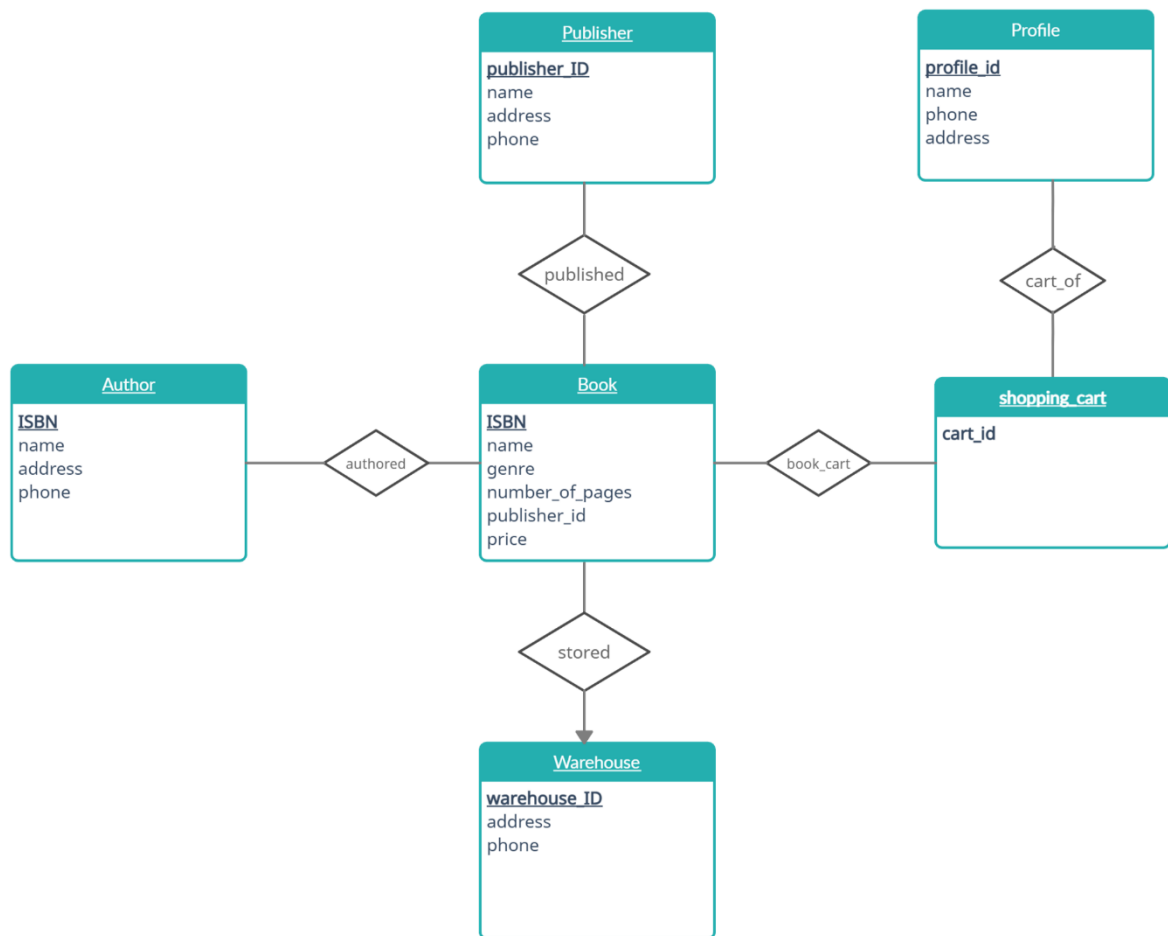


COMP 3005 Final Project Report
Online Bookstore

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Conceptual Design



Our conceptual design is based entirely on the information provided in the problem statement. The main assumption needed to run the database is that there is only one warehouse, as detailed in the problem statement. Otherwise, the design is solely based on the requirements in the problem statement with no other assumptions added to it.

Reduction to Relation Schemas

Publisher(publisher_id, name, address, phone)
Published(published_id, book ISBN)
Author(author_ID, name, address, phone)
By(author_ID, book ISBN)
Book(ISBN, name, genre, number_of_pages, price)
Stored(book ISBN, warehouse_ID)
Warehouse(warehouse_ID, address, phone)
Profile (profile_id, name, address, phone)
Cart_of(user_id)
Has(book ISBN)
Shopping cart(cart_id)

Normalization of Relation Schemas

//author

author(author_id, name, address, phone);

F = {

Author_ID -> name, address, phone

}

The relation is in good normal form in BCNF because the author_id is a superkey.

Author_ID is in BCNF because [Author_ID]⁺ = Author_ID, name, address, phone

//publisher

publisher(publisher_id, name, address, phone);

F = {

Publisher_ID -> name, address, phone

}

The relation is in good normal form in BCNF because the publisher_id is a superkey.

Publisher_ID is in BCNF because [Publisher_ID]⁺ = Publisher_ID, name, address, phone

//Book

book(isbn, name, genre, number_of_pages, price);

F = {

ISBN -> name, genre, number_of_pages, price

}

The relation is in good normal form in BCNF because the ISBN is a superkey

ISBN is in BCNF because [ISBN]⁺ = ISBN, name, genre, number_of_pages, price

//Warehouse

warehouse(warehouse_id, address, phone)

F = {

Warehouse_id -> address, phone

}

The relation is in good normal form in BCNF because the Warehouse_id is a superkey

Warehouse_id is in BCNF because [Warehouse_id]⁺ = Warehouse_id, address, phone

//User

user(user_id, name, address, phone)

F = {

User_id -> name, address, phone

}

The relation is in good normal form in BCNF because the User_id is a superkey

User_id is in BCNF because [User_id]⁺ = User_id, name, address, phone

//Authored

Authored(author_id, ISBN)

F = {

author_id, ISBN -> ISBN

}

The relation is in good normal form in BCNF because it has one functional dependency which is trivial. ie. ISBN is a subset of author_id and ISBN

```
//Published
Published(published_id, ISBN)
F= {
published_id, ISBN -> ISBN
}
```

The relation is in good normal form in BCNF because it has one functional dependency which is trivial. ie. ISBN is a subset of publisher_id and ISBN

```
//stored
stored(ISBN, warehouse_id)
F = {
ISBN -> warehouse_id
}
```

The relation is in good normal form in BCNF because the ISBN is a superkey
ISBN is in BCNF because [ISBN]⁺ = ISBN, Warehouse_id

```
//Book_Cart
Book_Cart( ISBN)
F= {
ISBN -> ISBN
}
```

The relation is in good normal form in BCNF because it has one functional dependency which is trivial. ie. ISBN is a subset of ISBN

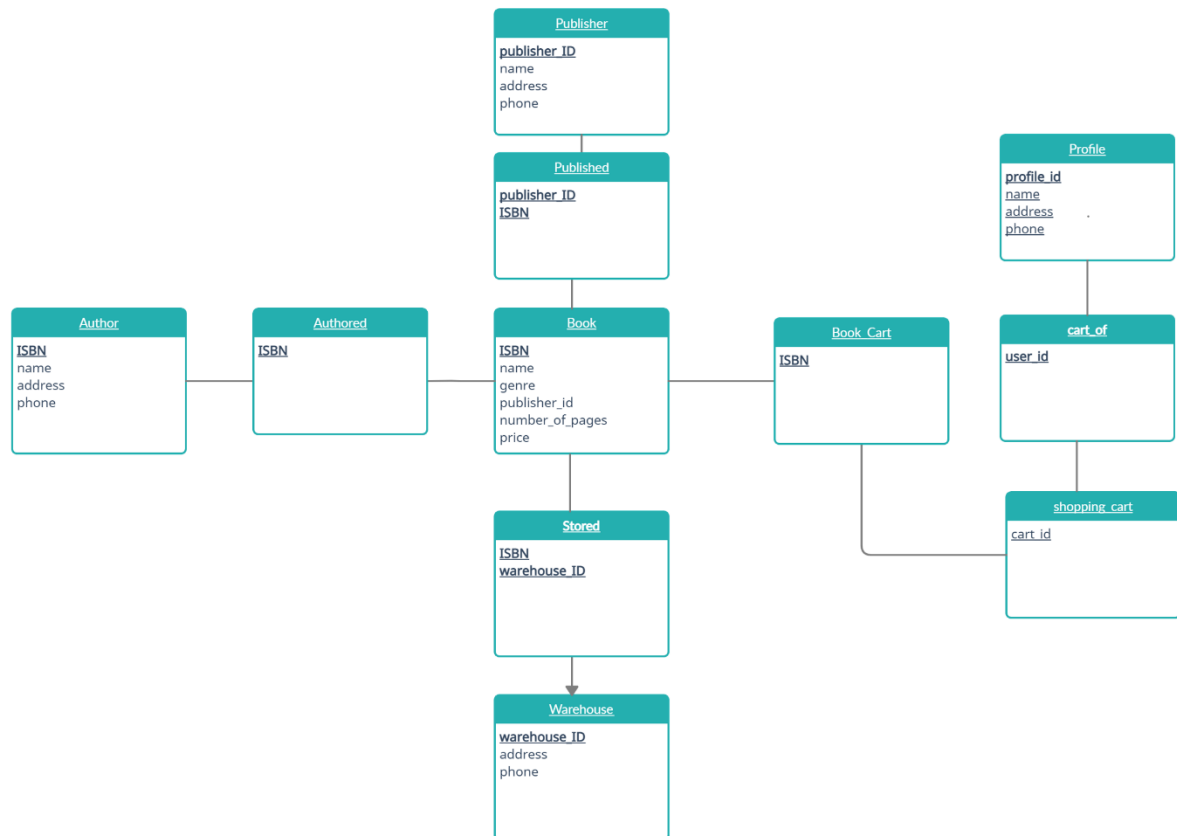
```
//Cart_of
Cart_of(user_id)
F= {
user_id -> user_id
}
```

The relation is in good normal form in BCNF because it has one functional dependency which is trivial. ie. user_id is a subset of user_id

```
//shopping_cart
shopping_cart(cart_id)
F= {
cart_id -> cart_id
}
```

The relation is in good normal form in BCNF because it has one functional dependency which is trivial. ie. cart_id is a subset of cart_id

Database Schema Diagram



Implementation

Appendix

Time availability:

- 11:00am
- 12:00pm
- 01:00pm