

# Look Inna Book - Project Report

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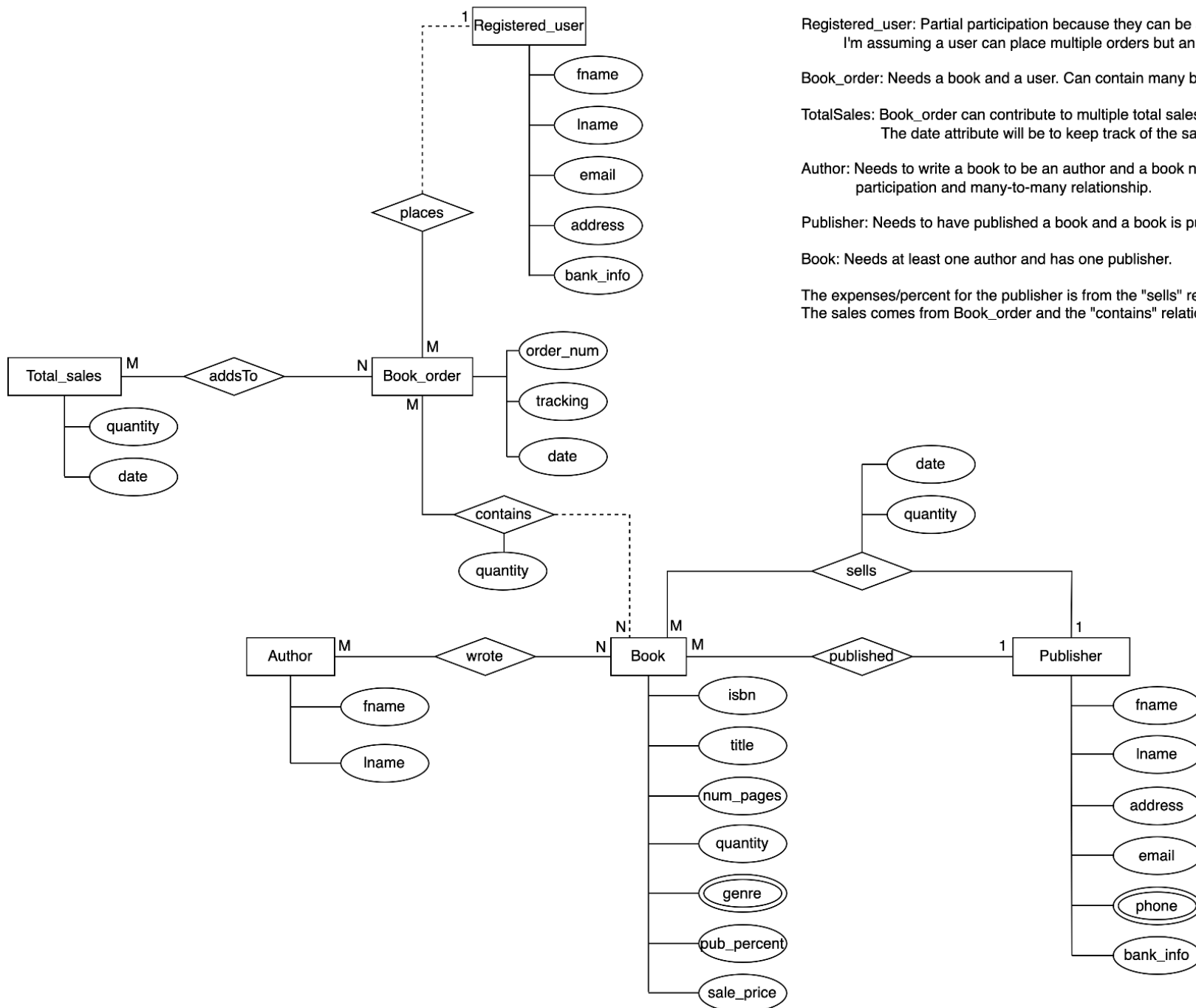
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# Conceptual Design



**Registered\_user:** Partial participation because they can be a user and not have an order placed.  
I'm assuming a user can place multiple orders but an order belongs to only one user.

**Book\_order:** Needs a book and a user. Can contain many books.

**TotalSales:** Book\_order can contribute to multiple total sales since there can be multiple books in an order.  
The date attribute will be to keep track of the sales by month and year.

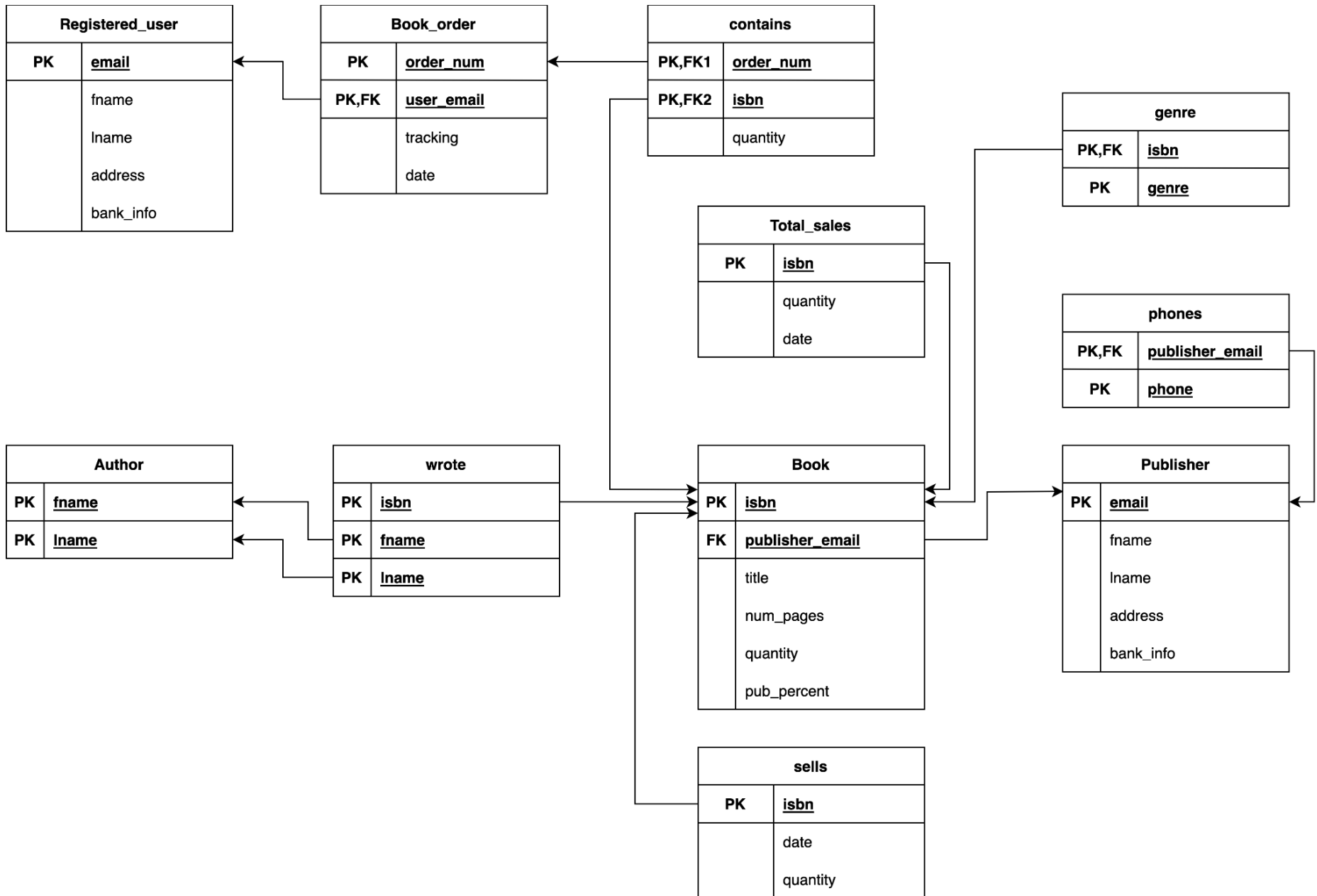
**Author:** Needs to write a book to be an author and a book needs at least 1 author so they are a full participation and many-to-many relationship.

**Publisher:** Needs to have published a book and a book is published by only one publisher.

**Book:** Needs at least one author and has one publisher.

The expenses/percent for the publisher is from the "sells" relationship  
The sales comes from Book\_order and the "contains" relationship

# Relation Schemas



## Normalization of Relation Schemas

I will be using the BCNF simplified test because all of my functional dependencies contain all of the attributes for their relations so they are not decompositions.

### **Relations with only trivial dependencies:**

- Author
  - $R = (\text{fname}, \text{lname})$
  - $F = \{ \text{fname}, \text{lname} \rightarrow \text{fname}, \text{lname} \}$
- wrote
  - $R = (\text{isbn}, \text{fname}, \text{lname})$
  - $F = \{ \text{isbn}, \text{fname}, \text{lname} \rightarrow \text{isbn}, \text{fname}, \text{lname} \}$
- genre
  - $R = (\text{isbn}, \text{genre})$
  - $F = \{ \text{isbn}, \text{genre} \rightarrow \text{isbn}, \text{genre} \}$
- phones
  - $R = (\text{publisher\_email}, \text{phone})$
  - $F = \{ \text{publisher\_email}, \text{phone} \rightarrow \text{publisher\_email}, \text{phone} \}$

All of these relations would pass since they are trivial/superkeys

### **Book Relation:**

$R = (\text{isbn}, \text{publisher\_email}, \text{title}, \text{num\_pages}, \text{quantity}, \text{pub\_percent}, \text{sale\_price})$

$F = \{ \text{isbn} \rightarrow \text{publisher\_email}, \text{title}, \text{num\_pages}, \text{quantity}, \text{pub\_percent}, \text{sale\_price}$   
 $\text{isbn}, \text{publisher\_email} \rightarrow \text{title}, \text{num\_pages}, \text{quantity}, \text{pub\_percent}, \text{sale\_price} \}$

$(\text{isbn})^+$

result = isbn

$\text{isbn} \rightarrow \text{publisher\_email}, \text{title}, \text{num\_pages}, \text{quantity}, \text{pub\_percent}, \text{sale\_price}$ : result = isbn, publisher\_email, title, num\_pages, quantity, pub\_percent, sale\_price

$\text{isbn}, \text{publisher\_email} \rightarrow \text{title}, \text{num\_pages}, \text{quantity}, \text{pub\_percent}, \text{sale\_price}$ : result = isbn, publisher\_email, title, num\_pages, quantity, pub\_percent, sale\_price

$(\text{isbn})^+$  contains all of the attributes so it passes the test

$(\text{isbn}, \text{publisher\_email})^+$

result = isbn, publisher\_email

$\text{isbn} \rightarrow \text{publisher\_email}, \text{title}, \text{num\_pages}, \text{quantity}, \text{pub\_percent}, \text{sale\_price}$ : result = isbn, publisher\_email, title, num\_pages, quantity, pub\_percent, sale\_price

$\text{isbn}, \text{publisher\_email} \rightarrow \text{title}, \text{num\_pages}, \text{quantity}, \text{pub\_percent}, \text{sale\_price}$ : result = isbn, publisher\_email, title, num\_pages, quantity, pub\_percent, sale\_price

$(\text{isbn}, \text{publisher\_email})^+$  contains all of the attributes so it passes the test as well  
Therefore, the Book relation is in normal form.

### **Publisher Relation:**

$R = (\text{email}, \text{fname}, \text{lname}, \text{address}, \text{bank\_info})$

$F = \{ \text{email} \rightarrow \text{fname}, \text{lname}, \text{address}, \text{bank\_info}$   
 $\text{bank\_info} \rightarrow \text{email}, \text{fname}, \text{lname}, \text{address} \}$

$(\text{email})^+$

result = email

$\text{email} \rightarrow \text{fname}, \text{lname}, \text{address}, \text{bank\_info}$ : result = email, fname, lname, address, bank\_info

$\text{bank\_info} \rightarrow \text{email}, \text{fname}, \text{lname}, \text{address}$ : result = email, fname, lname, address, bank\_info

$(\text{email})^+$  contains all of the attributes so it passes the test

$(\text{bank\_info})^+$

result = bank\_info

$\text{email} \rightarrow \text{fname}, \text{lname}, \text{address}, \text{bank\_info}$ : result = bank\_info

$\text{bank\_info} \rightarrow \text{email}, \text{fname}, \text{lname}, \text{address}$ : result = email, fname, lname, address, bank\_info

$(\text{bank\_info})^+$  contains all of the attributes so it passes the test

Therefore, the Publisher relation is in normal form.

### **Registered\_user Relation:**

$R = (\text{email}, \text{fname}, \text{lname}, \text{address}, \text{bank\_info})$

$F = \{ \text{email} \rightarrow \text{fname}, \text{lname}, \text{address}, \text{bank\_info}$   
 $\text{bank\_info} \rightarrow \text{email}, \text{fname}, \text{lname}, \text{address} \}$

$(\text{email})^+$

result = email

$\text{email} \rightarrow \text{fname}, \text{lname}, \text{address}, \text{bank\_info}$ : result = fname, lname, address, bank\_info

$\text{bank\_info} \rightarrow \text{email}, \text{fname}, \text{lname}, \text{address}$ : result = fname, lname, address, bank\_info, email

$(\text{email})^+$  contains all of the attributes so it passes the test

$(\text{bank\_info})^+$

result = bank\_info

$\text{email} \rightarrow \text{fname}, \text{lname}, \text{address}, \text{bank\_info}$ : result = bank\_info

$\text{bank\_info} \rightarrow \text{email}, \text{fname}, \text{lname}, \text{address}$ : result = bank\_info, email, fname, lname, address

$(\text{bank\_info})^+$  contains all of the attributes so it passes the test

Therefore, the Registered\_user relation is in normal form.

**Book\_order Relation:**

$R = (\text{order\_num}, \text{user\_email}, \text{tracking}, \text{date})$

$F = \{ \text{order\_num} \rightarrow \text{user\_email}, \text{tracking}, \text{date} \\ \text{order\_num}, \text{user\_email} \rightarrow \text{tracking}, \text{date} \}$

$(\text{order\_num})^+$

result = order\_num

$\text{order\_num} \rightarrow \text{user\_email}, \text{tracking}, \text{date}$ : result = order\_num, user\_email, tracking, date

$\text{order\_num}, \text{user\_email} \rightarrow \text{tracking}, \text{date}$ : result = order\_num, user\_email, tracking, date

$(\text{order\_num})^+$  contains all of the attributes so it passes the test

$(\text{order\_num}, \text{user\_email})^+$

result = order\_num, user\_email

$\text{order\_num} \rightarrow \text{user\_email}, \text{tracking}, \text{date}$ : result = order\_num, user\_email, tracking, date

$\text{order\_num}, \text{user\_email} \rightarrow \text{tracking}, \text{date}$ : result = order\_num, user\_email, tracking, date

$(\text{order\_num}, \text{user\_email})^+$  contains all of the attributes so it passes the test

Therefore, the Book\_order relation is in normal form.

**Contains Relation:**

$R = (\text{order\_num}, \text{isbn}, \text{quantity})$

$F = \{ \text{order\_num}, \text{isbn} \rightarrow \text{quantity} \}$

$(\text{order\_num}, \text{isbn})^+$

result = order\_num, isbn

$\text{order\_num}, \text{isbn} \rightarrow \text{quantity}$ : result = order\_num, isbn, quantity

$(\text{order\_num}, \text{isbn})^+$  contains all of the attributes so it passes the test

Therefore, the contains relation is in normal form.

**Total\_sales Relation:**

$R = (\text{isbn}, \text{quantity}, \text{date})$

$F = \{ \text{isbn}, \text{date} \rightarrow \text{quantity} \}$

$(\text{isbn}, \text{date})^+$

result = isbn, date

$\text{isbn}, \text{date} \rightarrow \text{quantity}$ : result = isbn, date, quantity

$(\text{isbn}, \text{date})^+$  contains all of the attributes so it passes the test

Therefore, the total\_sales relation is in normal form.

The sells relation is the same as the total\_sales for this test (They represent different things but their attribute names and their functional dependencies are the same)

## **Implementation**

# **Github Repository**

[https://github.com/maykalasalinas-roy/comp3005\\_finalProject](https://github.com/maykalasalinas-roy/comp3005_finalProject)