University of Bahrain

College of Information System

Department of Information

2023-2024 1nd Semester

ITIS416– Database System Development

Library Database Management System

Knowledge Corner Library

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1.Introduction:

Many customers visit us to create memberships and purchase books. Therefore, we at the Knowledge Corner Library need to develop our services and solve the problems that the library suffers from by creating a database system that helps accurately store all information related to each customer and maintain the security of the information. This makes it easier for employees to use and faster than the manual system, which led to many problems with customer information, such as data duplication. Therefore, in this report we aim to improve our services by fixing these issues that lead to significant losses to our library.

1.1. Background:

A library system is a comprehensive structure that includes processes, technologies, and resources used to manage and facilitate library operations. It includes various components such as cataloguing, distribution, acquisition, user management and resource management. Traditionally, library systems have relied on manual processes and paper documentation. However, as technology has advanced, computerized library systems have emerged. Often implemented through integrated library systems (ILS) or library management software, these systems automate tasks such as cataloguing materials, tracking circulation, managing purchases, and maintaining patron records. They also provide online catalogs and databases so users can browse and access library resources. Modern library systems have evolved with the development of digital libraries and electronic resources. Libraries are currently faced with the challenge of managing physical and digital collections and ensuring continuous access to e-books, online journals, and multimedia resources. Overall, library systems have transformed libraries into efficient and technologically advanced institutions, allowing librarians to streamline their operations, improve services, and provide library users with greater access to information.

1.2. Problem description:

The manual system currently used in the library results in duplicate data, inconsistent customer information, and slow performance. A lot of customer data is captured in various manual records, leading to inefficiencies and errors. Inconsistent data formats and content make it difficult to effectively serve library users. Manual processes for retrieving and updating customer data slow down processes and reduce productivity. Additionally, storing redundant data in different datasets wastes valuable space. To solve these problems, implementing a new database system is crucial. This system would centralize customer data, eliminate duplication of effort, and ensure data consistency. By simplifying data entry and validation processes, the new system would increase accuracy. This would also enable quick retrieval and updating of customer data, improving the speed and efficiency of operations. Additionally, the database system optimizes disk space utilization by eliminating unnecessary data storage and implementing efficient data compression techniques. Overall, the new system would improve data management, streamline operations, and provide a more effective and efficient library experience for both staff and patrons.

1.3. Project Objectives:

The main goal of this project is to enhance the system by replacing the old system with a new one that allows for the store of all customer information while keeping the information secure. The employee can use the system, where it will be easy to use, useful to reduce data redundancy, and fast data access.

1.4. Data Collection:

Our proposed system for the given problem scenario comprises nine entities, namely:

- Member Entity
- Book Entity
- Branch Entity
- Author Entity
- Publisher Entity
- Staff Entity
- Payment Entity
- Delivery Entity
- Orders Entity

To adhere to privacy regulations and protect the confidentiality of the center's clients, we will be utilizing raw data from the internet to showcase the system, as we are not authorized to access the clients' personal information directly.

2. Data Dictionary:

2.1. Member Entity

Name	Datatype	Length/Size	PK	FK	Not Null	Description
Member_ID	Varchar2	5	YES	-	YES	Uniquely member identifier
M_First_Name	Varchar2	20	-	-	-	Member First Name
M_Last_Name	Varchar2	20	-	-	-	Member Last Name
M_Email	Varchar2	30	-	-	-	Member Email
M_Username	Varchar2	10	-	-	-	Member Username
M_Password	Varchar2	10	-	-	-	Member Password
M_Address	Varchar2	30	-	-	-	Member House Address
M_Number	Number	8	-	-	-	Member phone number

2.2. Book Entity

Name	Datatype	Length/Size	PK	FK	Not Null	Description
Book_ID	Varchar2	5	YES	-	YES	Uniquely Book identifier
Book_Title	Varchar2	20	-	-	-	Book title
Category	Varchar2	40	-	-	-	Category of the book
Stock	Varchar2	10	-	-	-	Book stock
Price	Number	10,3	-	-	-	Book Price
Book_Publication_Date	Date	-	-	-	-	Date that the book has been published
Book_Description	Varchar2	30	-	-	-	Book description
Publisher_ID	Varchar2	5	-	YES	-	Uniquely Publisher identifier
Author_ID	Varchar2	5	-	YES	-	Uniquely Author identifier

2.3. Branch Entity

Name	Datatype	Length/Size	PK	FK	Not Null	Description
Branch_NO	Number	8	YES	-	YES	Uniquely Branch identifier
Location	Varchar2	30	-	-	-	Branch Location

2.4. Author Entity

Name	Datatype	Length/Size	PK	FK	Not Null	Description
Author_ID	Varchar2	5	YES	-	YES	Uniquely Author identifier
A_First_Name	Varchar2	20	-	-	-	Author First Name
A_Last_Name	Varchar2	20	-	-	-	Author Last Name

2.5. Publisher Entity

Name	Datatype	Length/Size	PK	FK	Not Null	Description
Publisher_ID	Varchar2	5	YES	-	YES	Uniquely Publisher identifier
Publisher_Name	Varchar2	20	-	-	-	Publisher Name
Publisher_Location	Varchar2	30	-	-	-	Publisher Location

2.6. Staff Entity

Name	Datatype	Length/Size	PK	FK	Not Null	Description
Staff_ID	Varchar2	5	YES	-	YES	Uniquely Staff identifier
S_First_Name	Varchar2	20	-	-	-	Staff First Name
S_Last_Name	Varchar2	20	-	-	-	Staff Last Name
Staff_Position	Varchar2	20	-	-	-	Staff Position
S_Email	Varchar2	30	-	-	-	Staff Email
Staff_Number	Number	8	-	-	-	Staff Phone Number
S_Username	Varchar2	10	-	-	-	Staff Username
S_Password	Varchar2	10	-	-	-	Staff Password
Branch_No	Number	8	-	YES	-	Uniquely Branch identifier

2.7. Orders Entity

Name	Datatype	Length/Size	PK	FK	Not Null	Description
Order_ID	Varchar2	5	YES	-	YES	Uniquely Order identifier
Delivery_Date	Date	-	-	-	-	The estimated date the order will arrived
Order_Total	Number	10,3	-	-	-	Total amount of the order
Order_Status	Varchar2	10	-	-	-	Order current status
Comments	Varchar2	50	-	-	-	Comments from the buyer for the order
Book_ID	Varchar2	5	-	YES	-	Uniquely Book identifier
Member_ID	Varchar2	5	-	YES	-	Uniquely Member identifier

2.8. Delivery Entity

Name	Datatype	Length/Size	PK	FK	Not Null	Description
Delivery_ID	Varchar2	5	YES	-	YES	Uniquely Delivery identifier
Delivery_Type	Varchar2	20	-	-	-	Delivery Type
Delivery_Fees	Number	10,3	-	-	-	Delivery fees for each order
Order_ID	Varchar2	5	-	YES	-	Uniquely Order identifier

2.9. Payment Entity

Name	Datatype	Length/Size	PK	FK	Not Null	Description
Payment_ID	Varchar2	5	YES	-	YES	Uniquely Payment identifier
Payment_Method	Varchar2	20	-	-	-	Payment method that the member used to pay
Payment_Status	Varchar2	20	-	-	-	Payment Status
Delivery_ID	Varchar2	5	-	YES	-	Uniquely Delivery identifier
Order_ID	Varchar2	5	-	YES	-	Uniquely Order identifier

3. Diagrams:

3.1. Entity Relationship Model (ER Model)

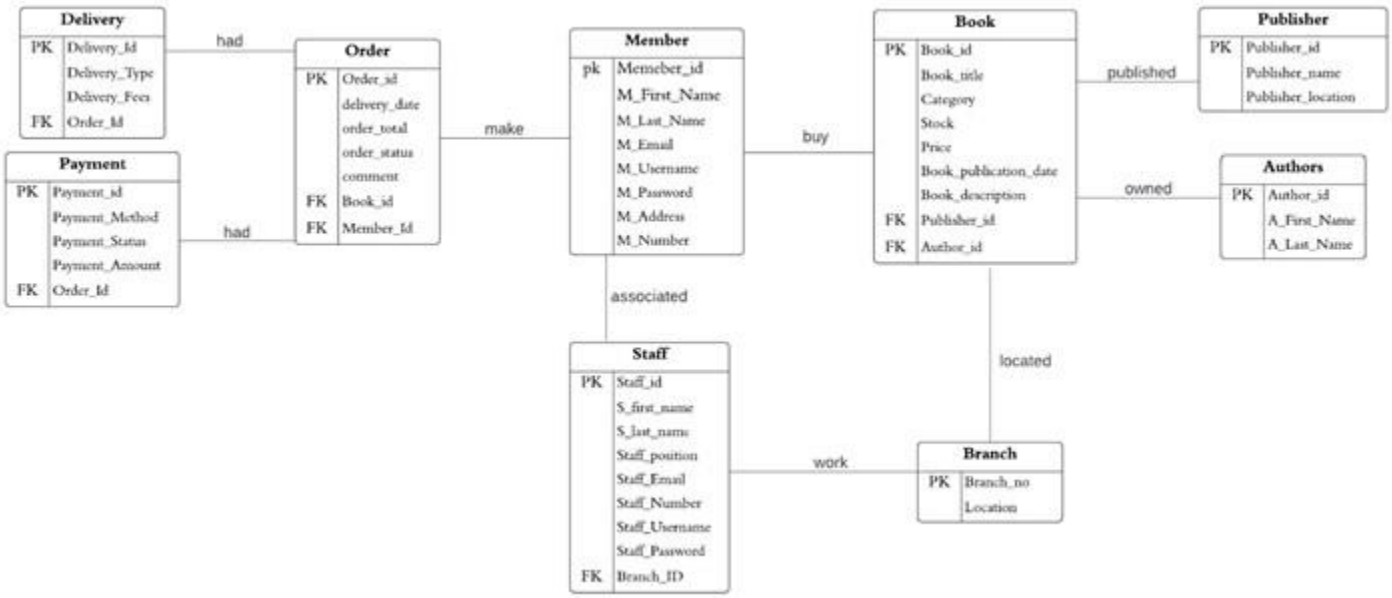

Figure 1. Entity Relationship Model

3.2. Extended Entity Relationship Model (EER Model)

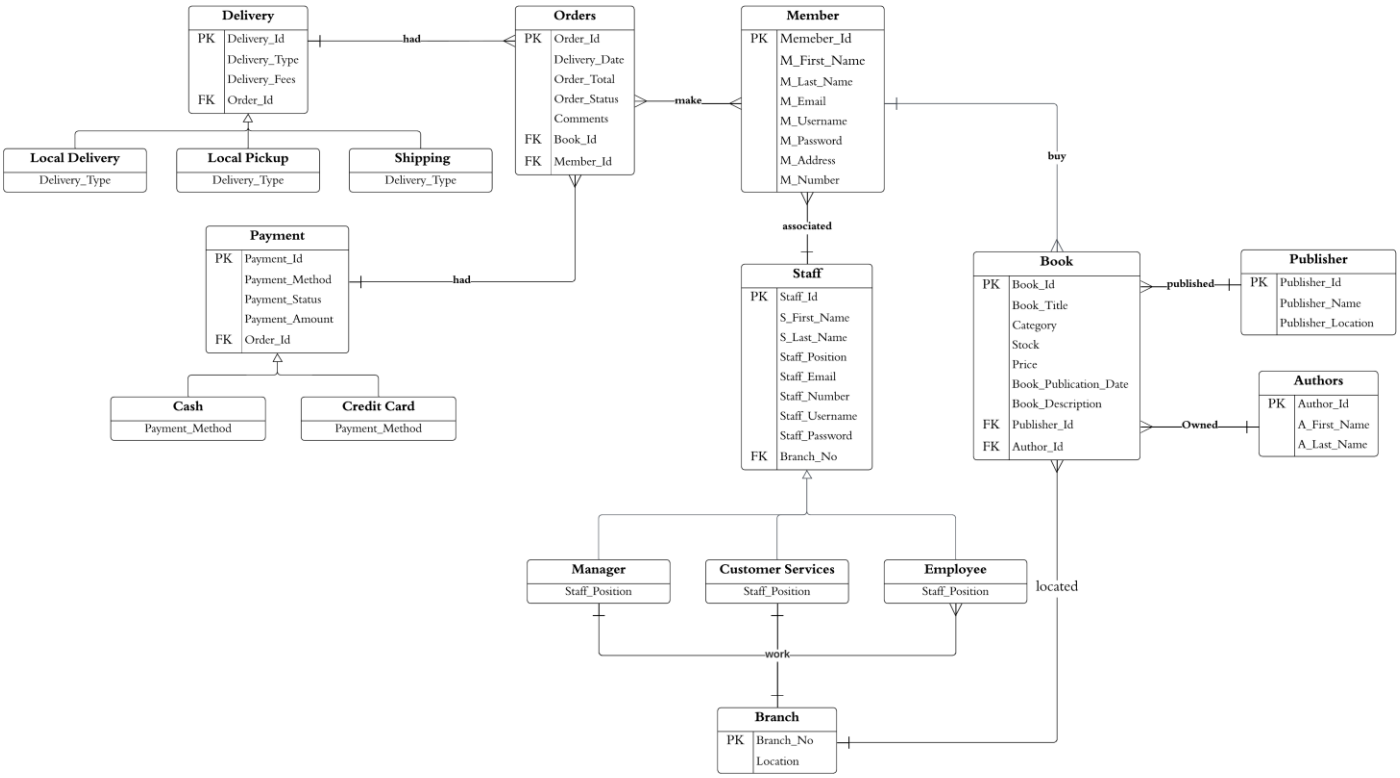

Figure 2. Extended Entity Relationship Model

4. Normalization:

Normalization is a technique used to reduce data duplication by organizing data inside the table and it has 3 stages: First Normal Form (1NF), Second Normal Form (2NF), and Third Normal Form (3NF).

4.1. The tables are in 1NF because:

- ✓ There are no repeating groups.
- ✓ Each table is uniquely identified by its own primary key.

4.2. The Entities are in 2NF because:

- ✓ It's in 1NF.
- ✓ It has no partial dependency and partial dependency means that some attributes depend on part of the primary key. This problem only occurs when there's a composite key within tables and since each entity in the library database has only one primary key the tables are automatically in 2NF.

4.3. The Entities are in 3NF because:

- ✓ It's in 2NF.
- ✓ It has no transitive dependency and transitive dependency means that an attribute is depending on a non-primary key attribute within the table.

- MEMBER (Member_iD, M_First_Name, M_Last_Name, M_Email, M_Username, M_Password, M_address, M_number)
- BOOK (Book_ID, Book_Title, Category, Stock, Price, Book_Publication_Date, Book_Description, Publisher_ID, Author_ ID)
- BRANCH (Branch_NO, Location)
- AUTHOR (Author_ID, A_First_Name, A_Last_Name)
- PUBLISHER (Publisher_ID, Publisher_Name, Publisher_Location)
- STAFF (Staff_ID, S_First_Name, S_Last_Name, Staff_Position, Staff_Email, Staff_Number, Staff_Username, Staff_Password, Branch_ID)
- PAYMENT (Payment_ID, Payment_Method, Payment_Status, Delivery_ID, Order_ID)
- DELIVERY (Delivery_ID, Delivery_Type, Delivery_Fees, Order_ID)
- ORDER (Order_ID, Delivery_Date, Order_Total, Order_Status, Comment, Book_ID, Member_ ID)

5. Table's Values:

5.1. Member Entity

Member_ID	M_First_Name	M_Last_Name	M_Email	M_Username	M_Password	M_address	M_number
M001	Sara	Ali	Sara9@gmail.com	Sara22	23456	Manama, house 277	38929494
M002	Ahmed	Mohammed	Ahmed55@gmail.com	Ahmed7	86955	Saar house no 337	38595969
M003	Ali	Hasan	Ali34@gmail.com	Ali77	88484	Muharraq house no 755	36729848
M004	Walaa	Saher	Walaa22@gmail.com	Walaa99	78484	Hid house no 454	74837748
M005	Manar	Ahmed	Manar2@gmail.com	Manar364	78676	Hamad town house no 342	37585758

5.2. Book Entity

Book_ID	Book_title	Category	Stock	Price	Book_Publication_Date	Book_ Description	Publisher_ID	Author_ID
B001	What to eat?	Cooking	3	4.6	10/11/2022	-	P001	A002
B002	How to paint	Drawing and painting	5	2.5	10/10/2020	-	P001	A004
B003	Sky	Games	9	3.5	01/10/2019	-	P003	A001
B004	Still house lake	Thriller	11	8.5	12/19/2015	-	P002	A003
B005	The dark vault	Horror	15	4.5	03/07/2010	-	P005	A005

5.3. Branch Entity

Branch_NO	Location
1	Manama
2	Saar
3	Sanabis
4	Muharraq
5	Isa Town

5.4. Author Entity

Author_ID	A_First_Name	A_Last_Name
A001	Sara	Miller
A002	Cristena	Jone
A003	Kylee	Sam
A004	George	Orwell
A005	Kurt	Vonnegut

5.5. Publisher Entity

Publisher_ID	Publisher_Name	Publisher_Location
P001	Hachette	India
P002	LB Books	New York
P003	Basic Books	Boulder
P004	Tor Books	New York
P005	Arkham House	Sauk City

5.6. Staff Entity

Staff_ID	S_First_Name	S_Last_Name	Staff_Position	S_Email	Staff_Number	S_Username	S_Password	Branch_NO
S001	Ali	Hasan	Manager	ali@gmai.com	35266366	Ali22	362636	1
S002	Qasim	Mohammed	Employee	qasim@gmail.com	36473838	Qasim4	757747	5
S003	Zainab	Ahmed	Customer Service	zainab@gmail.com	77474737	Zainab2	758484	3
S004	Basma	Salim	Manager	basma@gmail.com	36263647	Basma88	536626	2
S005	Fatema	Khalid	Employee	fatema@gmail.com	63728738	Fatema37	637727	4

5.7. Orders Entity

Order_ID	Delivery_Date	Order_total	Order_Status	Comments	Book_ID	Member_ID
O001	02/11/2023	4.600	Pending	-	B001	M001
O002	04/11/2023	4.500	Rejected	-	B002	M002
O003	11/19/2023	13.500	Completed	-	B003	M003
O004	02/05/2022	18.500	Completed	-	B004	M004
O005	09/12/2022	6.500	Rejected	-	B005	M005

5.8. Delivery Entity

Delivery_ID	Delivery_Type	Delivery_Fees	Order_ID
D001	Local Pickup	0.000	O001
D002	Local delivery	2.000	O002
D003	Shipping	10.00	O003
D004	Shipping	10.00	O004
D005	Local delivery	2.000	O005

5.9. Payment Entity

Payment_ID	Payment_Method	Payment_Status	Delivery_ID	Order_ID
P001	Cash	Completed	D001	O001
P002	Credit Card	Declined	D002	O002
P003	Credit Card	Completed	D003	O003
P004	Cash	Completed	D004	O004
P005	Credit Card	Declined	D005	O005

6.SQL Statements (Tables):

6.1. Member Table

```
CREATE TABLE MEMBER
  (         MEMBER_ID VARCHAR2(5 CHAR) NOT NULL,
            M_FIRST_NAME VARCHAR2(20 CHAR),
            M_LAST_NAME VARCHAR2(20 CHAR),
            M_EMAIL VARCHAR2(30 CHAR),
            M_USERNAME VARCHAR2(10 CHAR),
            M_PASSWORD VARCHAR2(10 CHAR),
            M_ADDRESS VARCHAR2(30 CHAR),
            M_NUMBER NUMBER (8,0),
             CONSTRAINT MEMBER_PK PRIMARY KEY (MEMBER_ID)
  ) ;
```

6.2. Book Table

```
  CREATE TABLE BOOK
  (         BOOK_ID VARCHAR2(5 CHAR) NOT NULL,
            BOOK_TITLE VARCHAR2(20 CHAR),
            CATEGORY VARCHAR2(40 CHAR),
            STOCK VARCHAR2(10 CHAR),
            PRICE NUMBER (10,3),
            BOOK_PUBLICATION_DATE DATE,
            BOOK_DESCRIPTION VARCHAR2(30 CHAR),
            PUBLISHER_ID VARCHAR2(5 CHAR) CONSTRAINT PUBLISHER_FK
REFERENCES MEMBER (PUBLISHER_ID),
            AUTHOR_ID VARCHAR2(5 CHAR) CONSTRAINT AUTHOR_FK
REFERENCES MEMBER (AUTHOR_ID),
            CONSTRAINT BOOK_PK PRIMARY KEY (BOOK_ID)
);
```

6.3. Branch Table

```
CREATE TABLE BRANCH
  (        BRANCH_NO NUMBER (8,0) NOT NULL,
           LOCATION VARCHAR2(30 CHAR),
            CONSTRAINT BRANCH_PK PRIMARY KEY (BRANCH_NO)
  ) ;
```

6.4. Author Table

```
CREATE TABLE AUTHOR
  (        AUTHOR_ID VARCHAR2(5 CHAR) NOT NULL,
           A_FIRST_NAME VARCHAR2(20 CHAR),
           A_LAST_NAME VARCHAR2(20 CHAR),
            CONSTRAINT AUTHOR_PK PRIMARY KEY (AUTHOR_ID)
  ) ;
```

6.5. Publisher Table

```
CREATE TABLE PUBLISHER
  (        PUBLISHER_ID VARCHAR2(5 CHAR) NOT NULL,
           PUBLISHER_NAME VARCHAR2(20 CHAR),
           PUBLISHER_LOCATION VARCHAR2(30 CHAR),
            CONSTRAINT PUBLISHER_PK PRIMARY KEY (PUBLISHER_ID)
  ) ;
```

6.6. Staff Table

```
CREATE TABLE STAFF
(
   STAFF_ID VARCHAR2(5 CHAR) NOT NULL,
   S_FIRST_NAME VARCHAR2(20 CHAR),
   S_LAST_NAME VARCHAR2(20 CHAR),
   STAFF_POSITION VARCHAR2(20 CHAR),
   S_EMAIL VARCHAR2(30 CHAR),
   STAFF_NUMBER  NUMBER(8),
   S_USERNAME VARCHAR2(10 CHAR),
   S_PASSWORD VARCHAR2(10 CHAR),
   BRANCH_NO NUMBER (8) CONSTRAINT BRANCH_FK REFERENCES BRANCH
(BRANCH_NO),
   CONSTRAINT STAFF_PK PRIMARY KEY (STAFF_ID)
);
```

6.7. Orders Table

```
CREATE TABLE ORDERS
(
   ORDER_ID VARCHAR2(5 CHAR) NOT NULL,
   DELIVERY_DATE DATE,
   ORDER_TOTAL NUMBER (10,3),
   ORDER_STATUS VARCHAR2(10 CHAR),
   COMMENTS VARCHAR2(50 CHAR),
   BOOK_ID VARCHAR2(5 CHAR) CONSTRAINT BOOK_FK REFERENCES BOOK
(BOOK_ID),
   MEMBER_ID VARCHAR2(5 CHAR) CONSTRAINT MEMBER_FK REFERENCES
MEMBER (MEMBER_ID),
   CONSTRAINT ORDERS_PK PRIMARY KEY (ORDER_ID)
);
```

6.8. Delivery Table

```
CREATE TABLE DELIVERY
 (
   DELIVERY_ID VARCHAR2(5 CHAR) NOT NULL,
   DELIVERY_TYPE VARCHAR2(10 CHAR),
   DELIVERY_FEES NUMBER (10,3),
   ORDER_ID VARCHAR2(5 CHAR) CONSTRAINT ORDER_FK REFERENCES
ORDERS (ORDER_ID),
   CONSTRAINT DELIVER_PK PRIMARY KEY (DELIVERY_ID)
);
```

6.9. Payment Table

```
CREATE TABLE PAYMENT
(
   PAYMENT_ID VARCHAR2(5 CHAR) NOT NULL,
   PAYMENT_METHOD VARCHAR2(20 CHAR),
   PAYMENT_STATUS VARCHAR2(20 CHAR),
   DELIVERY_ID VARCHAR2(5 CHAR) CONSTRAINT DELIVERY_FK REFERENCES
DELIVERY (DELIVERY_ID),
   ORDER_ID VARCHAR2(5 CHAR) CONSTRAINT ORDER1_FK REFERENCES
ORDERS (ORDER_ID),
   CONSTRAINT PAYMENT_PK PRIMARY KEY (PAYMENT_ID)
);
```

7. Queries

7.1. List all member in the library.

```
select * from member;
```

Results | Explain | Describe | Saved SQL | History

MEMBER_ID	M_FIRST_NAME	M_LAST_NAME	M_EMAIL	M_USERNAME	M_PASSWORD	M_ADDRESS	M_NUMBER
M003	Ali	Hasan	Ali34@gmail.com	Ali77	88484	Muharraq house no 755	36729848
M004	Walaa	Saher	Walaa22@gmail.com	Walaa99	78484	Hid house no 454	74837748
M005	Manar	Ahmed	Manar2@gmail.com	Manar364	78676	Hamad town house no 342	37585758
M001	Sara	Ali	Sara9@gmail.com	Sara22	23456	Manama, house 277	38929494
M002	Ahmed	Mohammed	Ahmed55@gmail.com	Ahmed7	86955	Saar house no 337	38595969

5 rows returned in 0.00 seconds Download

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7.2. Find the information of publisher name where end to 'e'.

```
select Publisher_ID, Publisher_Name from Publisher
where Publisher_Name like '%e';
```

Results | Explain | Describe | Saved SQL | History

PUBLISHER_ID	PUBLISHER_NAME
P001	Hachette
P005	Arkham House

2 rows returned in 0.03 seconds Download

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7.3. Display the staff where work in Employee position.

```
SELECT S_First_Name, S_Last_Name, Staff_Position FROM staff
WHERE Staff_Position IN 'Employee';
```

Results | Explain | Describe | Saved SQL | History

S_FIRST_NAME	S_LAST_NAME	STAFF_POSITION
Qasim	Mohammed	Employee
Fatema	Khalid	Employee

2 rows returned in 0.00 seconds Download

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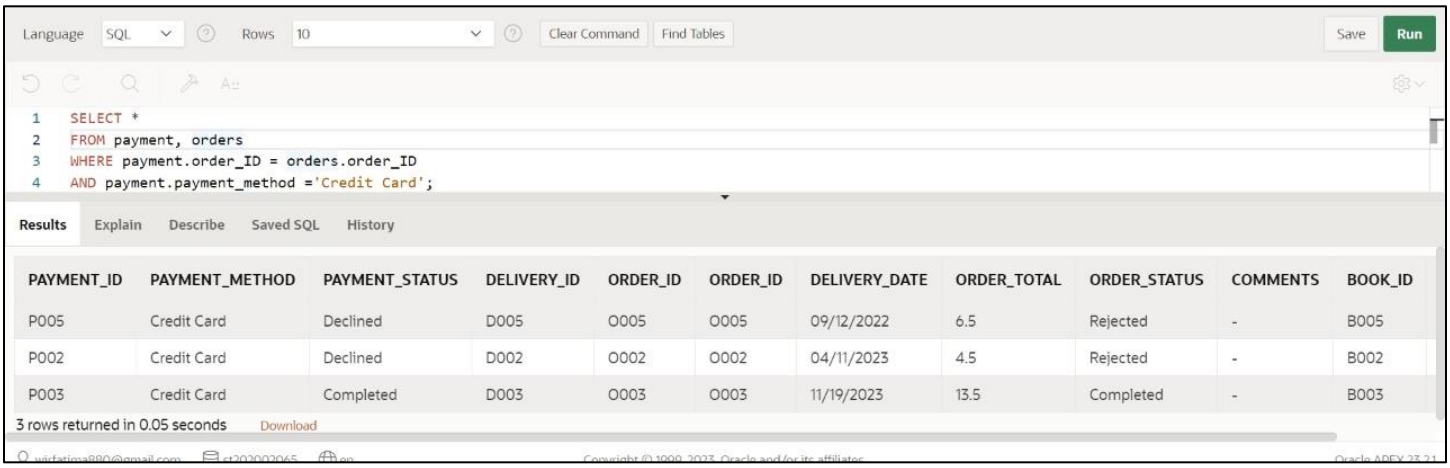
7.4. Find the Order details which is Payment by Credit Card.



```
SELECT *
FROM payment, orders
WHERE payment.order_ID = orders.order_ID
AND payment.payment_method ='Credit Card';
```

Results | Explain | Describe | Saved SQL | History

PAYMENT_ID	PAYMENT_METHOD	PAYMENT_STATUS	DELIVERY_ID	ORDER_ID	ORDER_ID	DELIVERY_DATE	ORDER_TOTAL	ORDER_STATUS	COMMENTS	BOOK_ID
P005	Credit Card	Declined	D005	O005	O005	09/12/2022	6.5	Rejected	-	B005
P002	Credit Card	Declined	D002	O002	O002	04/11/2023	4.5	Rejected	-	B002
P003	Credit Card	Completed	D003	O003	O003	11/19/2023	13.5	Completed	-	B003

3 rows returned in 0.05 seconds Download

7.5. Modify the delivery fees to 2.500 whose delivery type is Local Delivery.

```
UPDATE Delivery
SET Delivery_Fees = 2.500
WHERE Delivery_Type = 'Local delivery';
```

Results | Explain | Describe | Saved SQL | History

2 row(s) updated.

0.03 seconds

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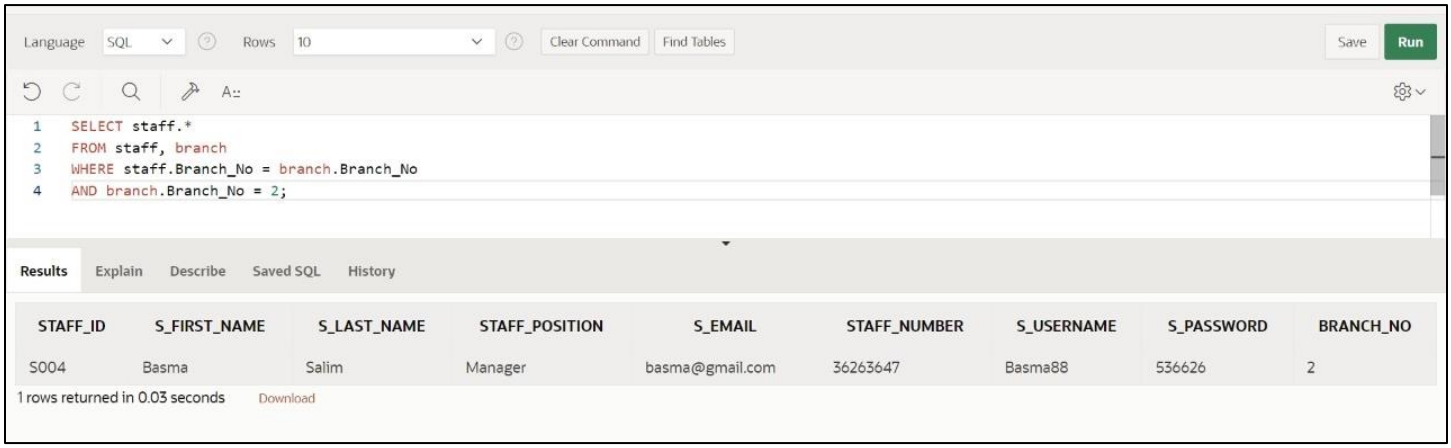
7.6. List the Staff whose work in branch number 2.



```
SELECT staff.*
FROM staff, branch
WHERE staff.Branch_No = branch.Branch_No
AND branch.Branch_No = 2;
```

Results | Explain | Describe | Saved SQL | History

STAFF_ID	S_FIRST_NAME	S_LAST_NAME	STAFF_POSITION	S_EMAIL	STAFF_NUMBER	S_USERNAME	S_PASSWORD	BRANCH_NO
S004	Basma	Salim	Manager	basma@gmail.com	36263647	Basma88	536626	2

1 rows returned in 0.03 seconds Download

7.7. Find the maximum and minimum of order where is completed order.

```
1  SELECT MAX(Order_Total) AS Maximum_Order_Total, MIN(Order_Total) AS Minimum_Order_Total
2  FROM Orders
3  WHERE Order_Status = 'Completed';
```

Results | Explain | Describe | Saved SQL | History

MAXIMUM_ORDER_TOTAL	MINIMUM_ORDER_TOTAL
18.5	13.5

1 rows returned in 0.00 seconds Download

7.8. Display all Payments that have the order date in year '2023' ascending order.

```
1  SELECT *
2  FROM orders
3  WHERE EXTRACT(YEAR FROM Delivery_Date) = 2023
4  ORDER BY Delivery_Date ASC;
```

Results | Explain | Describe | Saved SQL | History

ORDER_ID	DELIVERY_DATE	ORDER_TOTAL	ORDER_STATUS	COMMENTS	BOOK_ID	MEMBER_ID
O001	02/11/2023	4.6	Pending	-	B001	M001
O002	04/11/2023	4.5	Rejected	-	B002	M002
O003	11/19/2023	13.5	Completed	-	B003	M003

3 rows returned in 0.01 seconds Download

7.9. Calculate the total stock of all books in the library.

```
1  select SUM(stock) as total_stock from BOOK;
```

Results | Explain | Describe | Saved SQL | History

TOTAL_STOCK
43

1 rows returned in 0.01 seconds Download

7.10. Display all books that have price between 2 and 5 BD

```
1  SELECT Book_ID, Book_Title , price FROM book
2  WHERE price >=2 AND Price <=5;
```

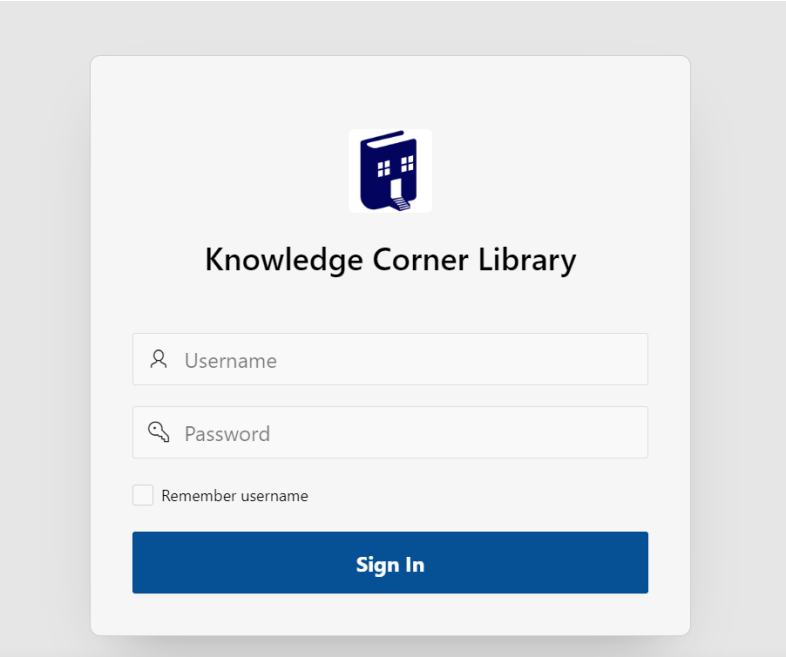
Results | Explain | Describe | Saved SQL | History

BOOK_ID	BOOK_TITLE	PRICE
B002	How to paint	2.5
B003	Sky	3.5
B001	What to eat?	4.6
B005	The dark vault	4.5

4 rows returned in 0.01 seconds Download

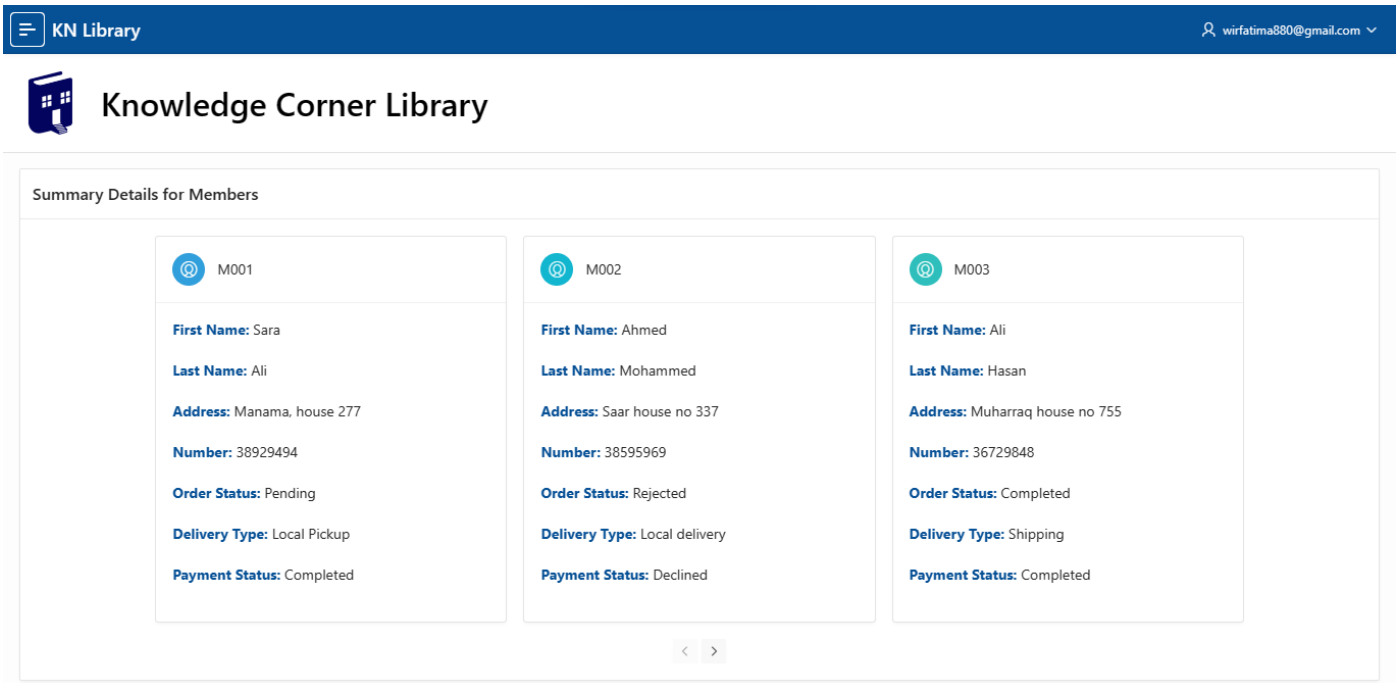
8. Application

8.1. Login page



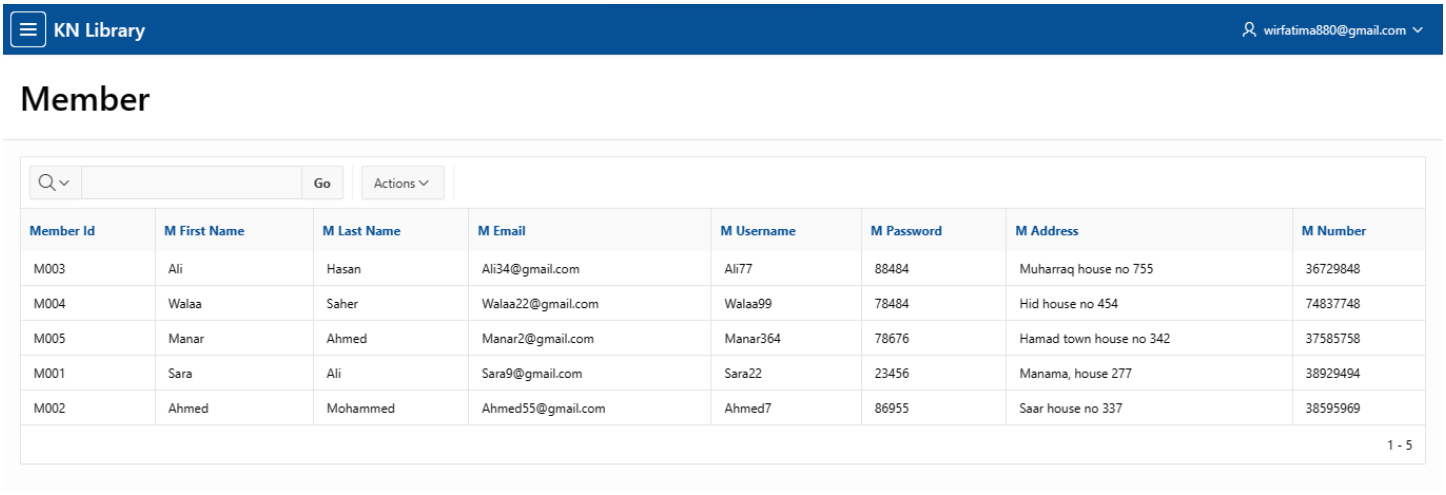
- This page designed specifically to enables employees access the system.

8.2. Home Page



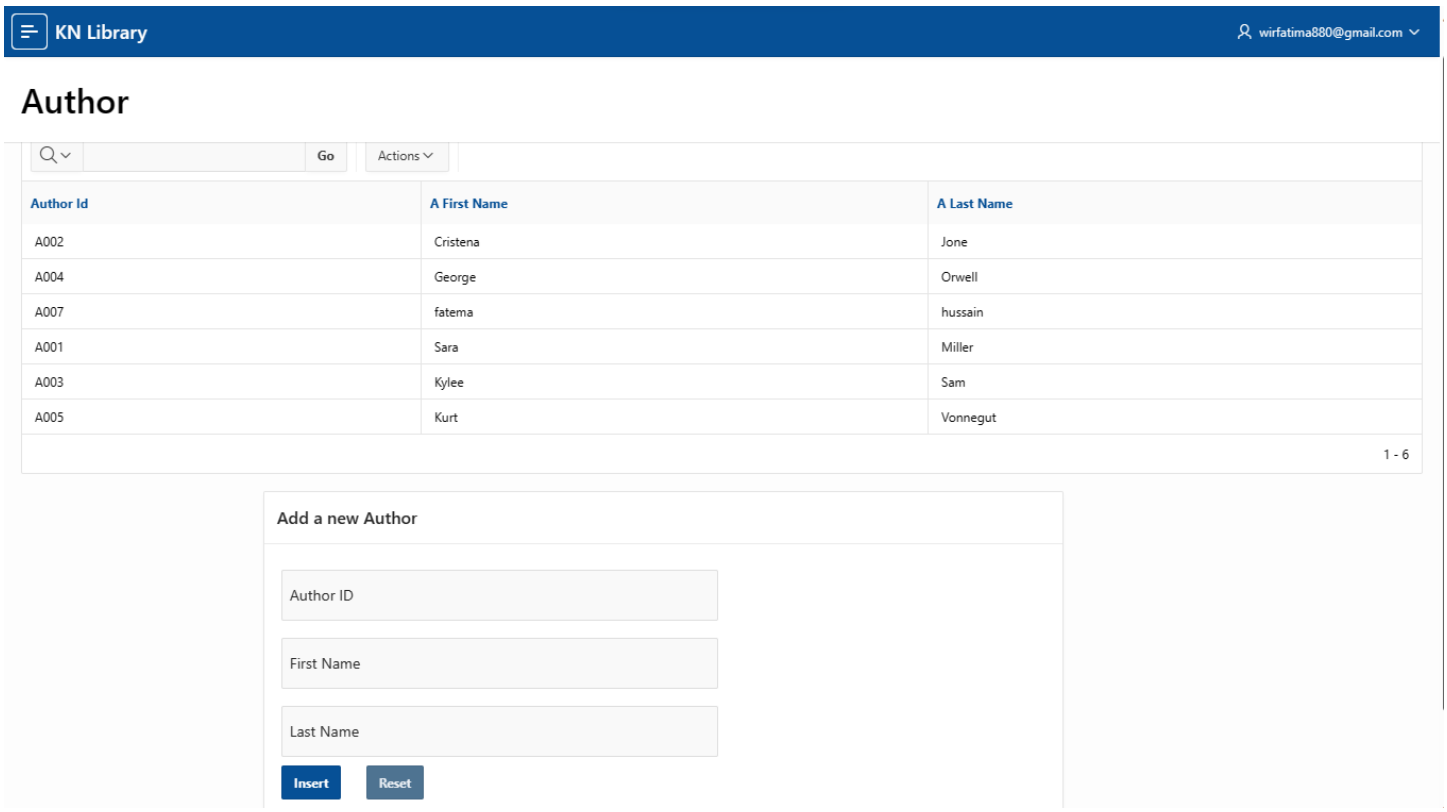
- In the home page, allows employees to view summary information for members. Also, we only display 3 cards per page, so we have M004 and M005 on the second page.

8.3. Member Page



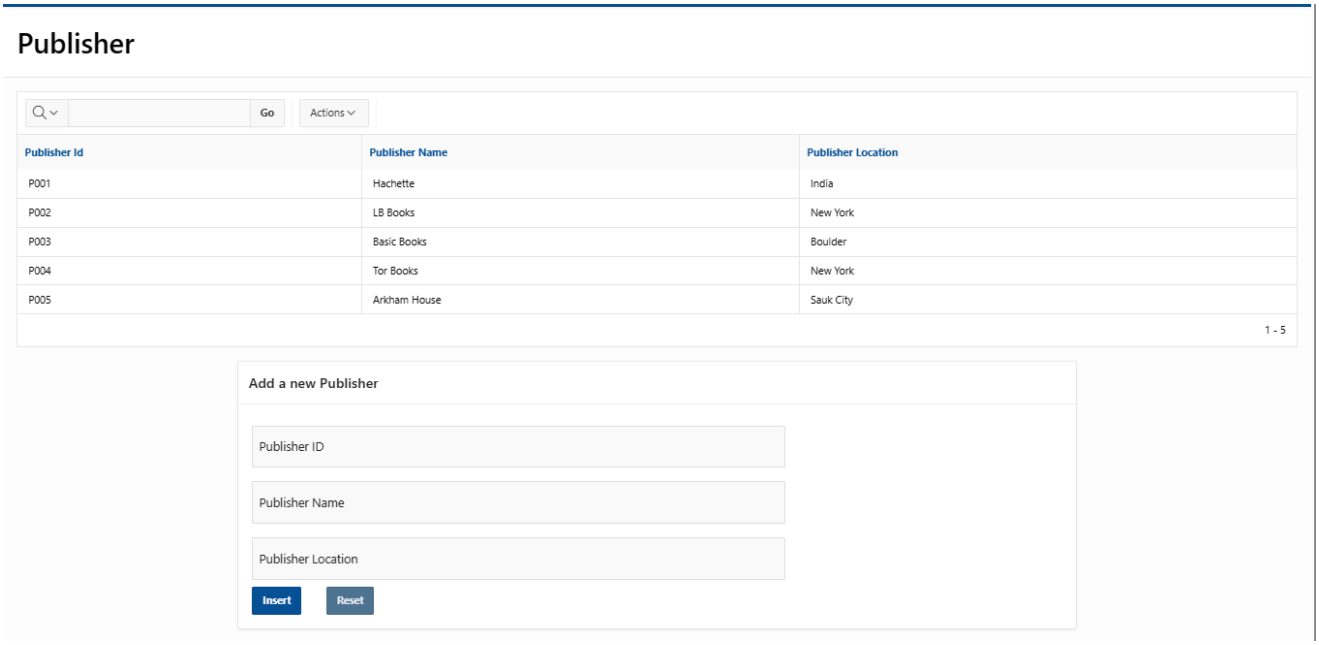
- Member page, this interface enables the employees of the library to display the members information of the library.

8.4. Author Page



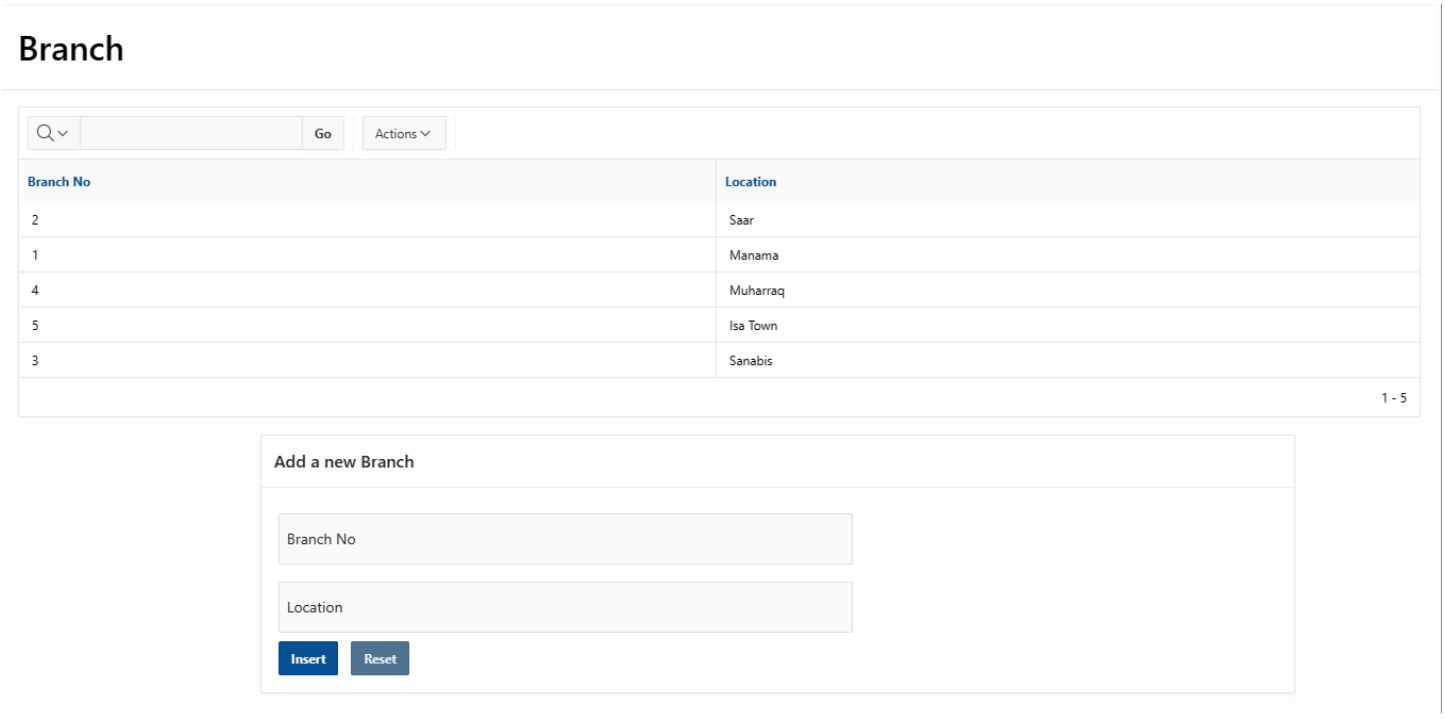
- This page displays the authors at the library, and the managers can add a new author or click Reset button to clear all information enter in the fields.

8.5. Publisher Page



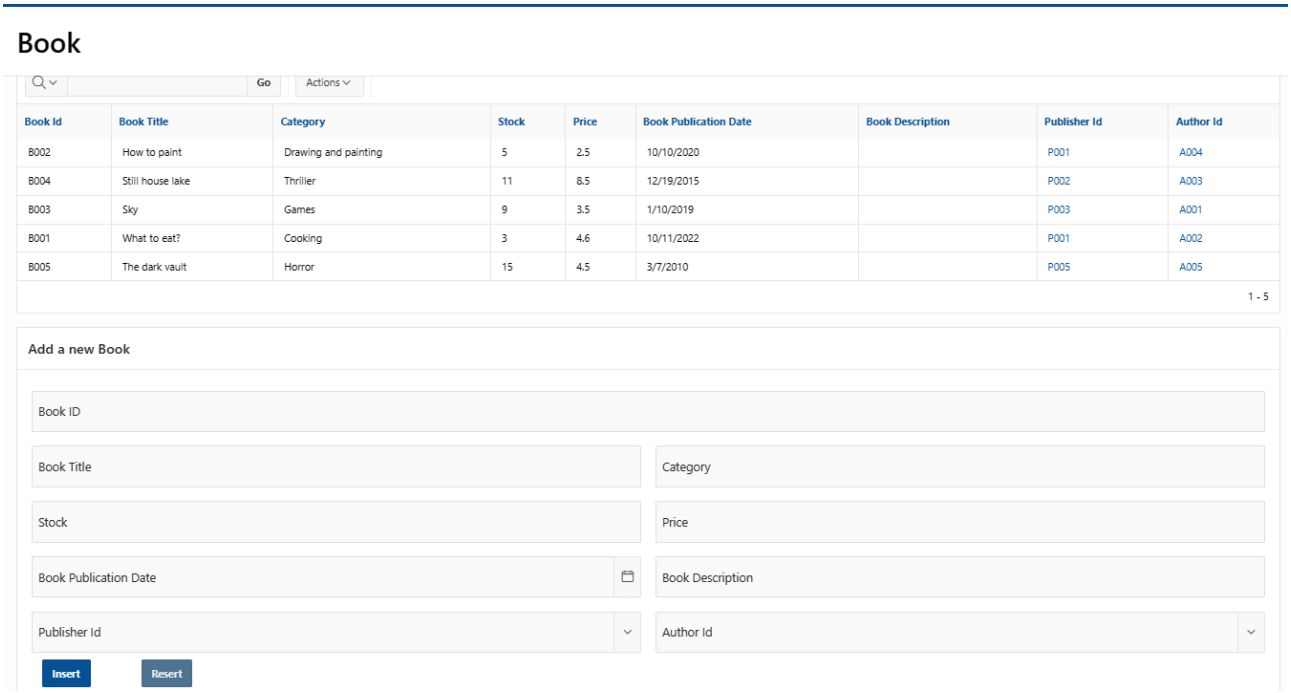
- This page created to displays the full information of the publisher, and the managers can add a new publisher or can manager clear all information in the fields when press Reset button.

8.6. Branch Page



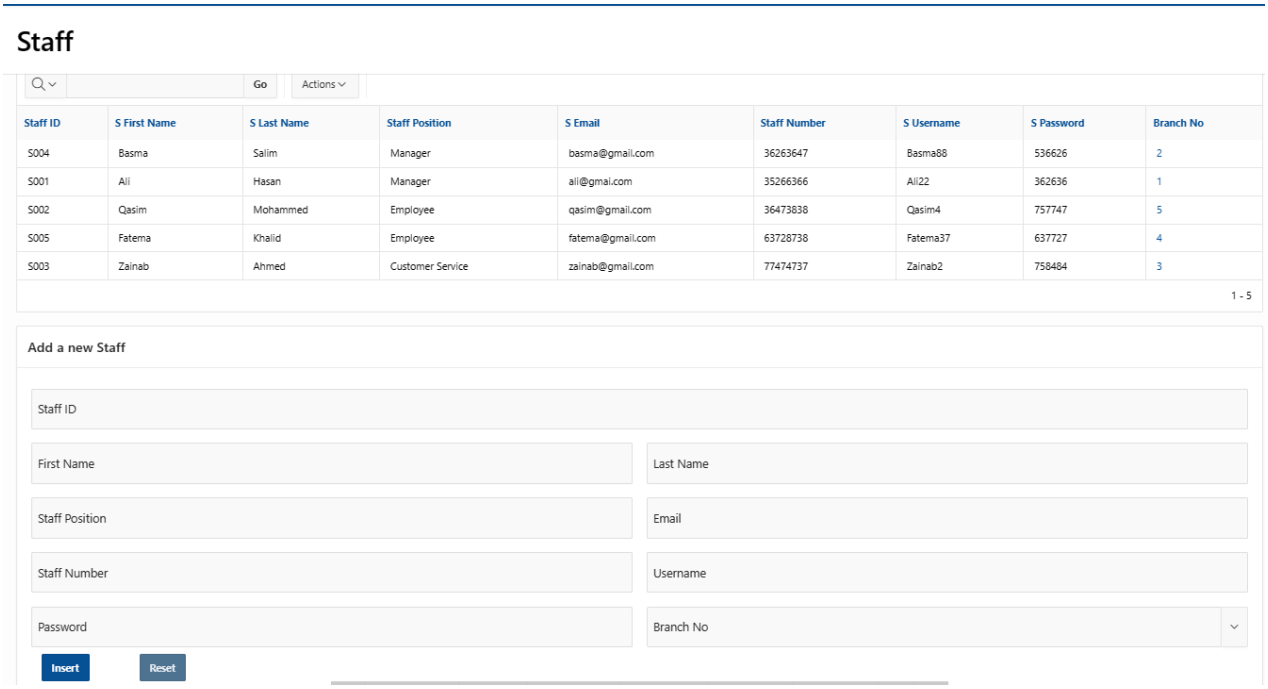
- This page created to show the available library branches that distributed across multiple locations, and the managers can add a new library branch or click to another button "Reset" to clear all information in the fields.

8.7. Book Page



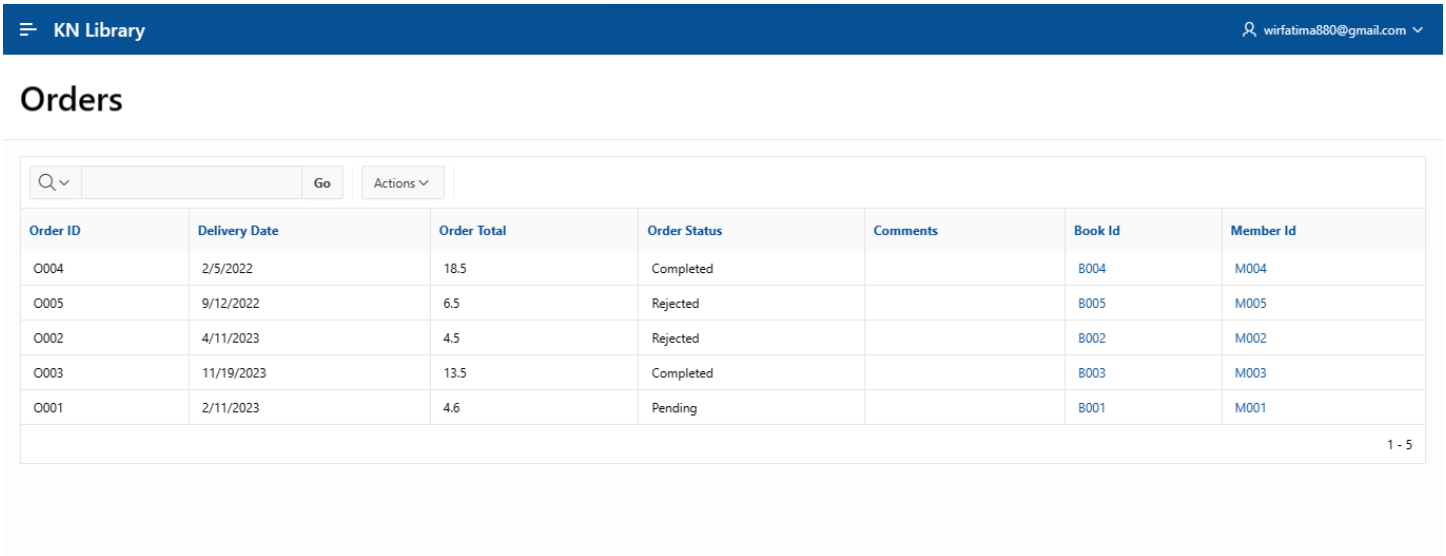
- This book page was created to display all book information in the library and allows employees to display the details about Publisher OR Author when press the ID without need to change the page. The manager can also add a new book, when cancel he can press the reset button to erase all data in the fields.

8.8. Staff Page



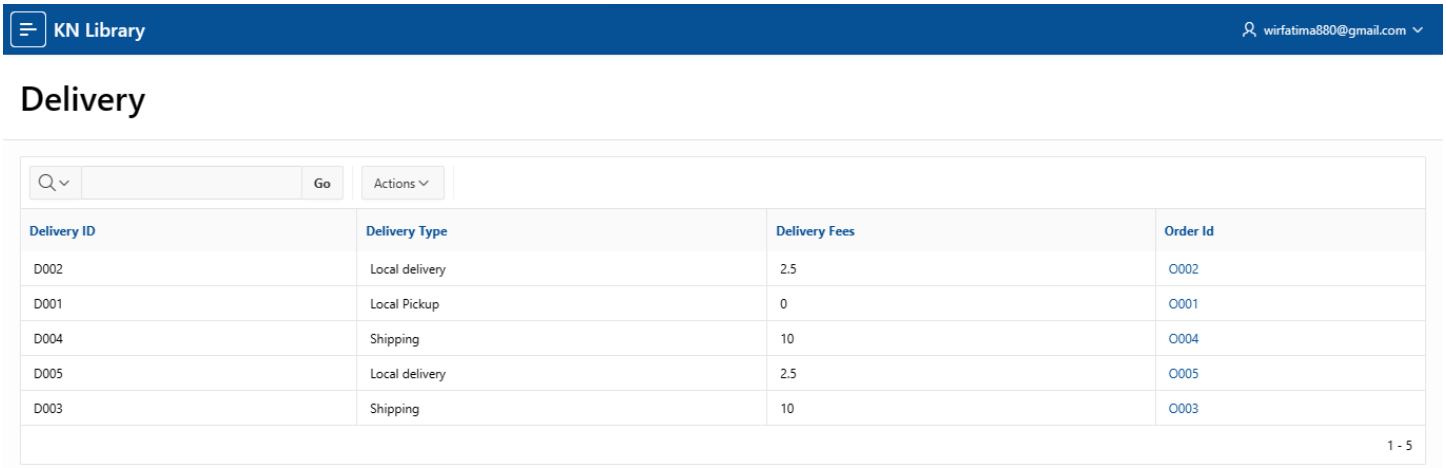
- - This page displays employee details in the library, and managers can add new employees or click Reset to clear all information in the fields. They are allowed to display the details about branch by clicking on the branch number.

8.9. Orders Page



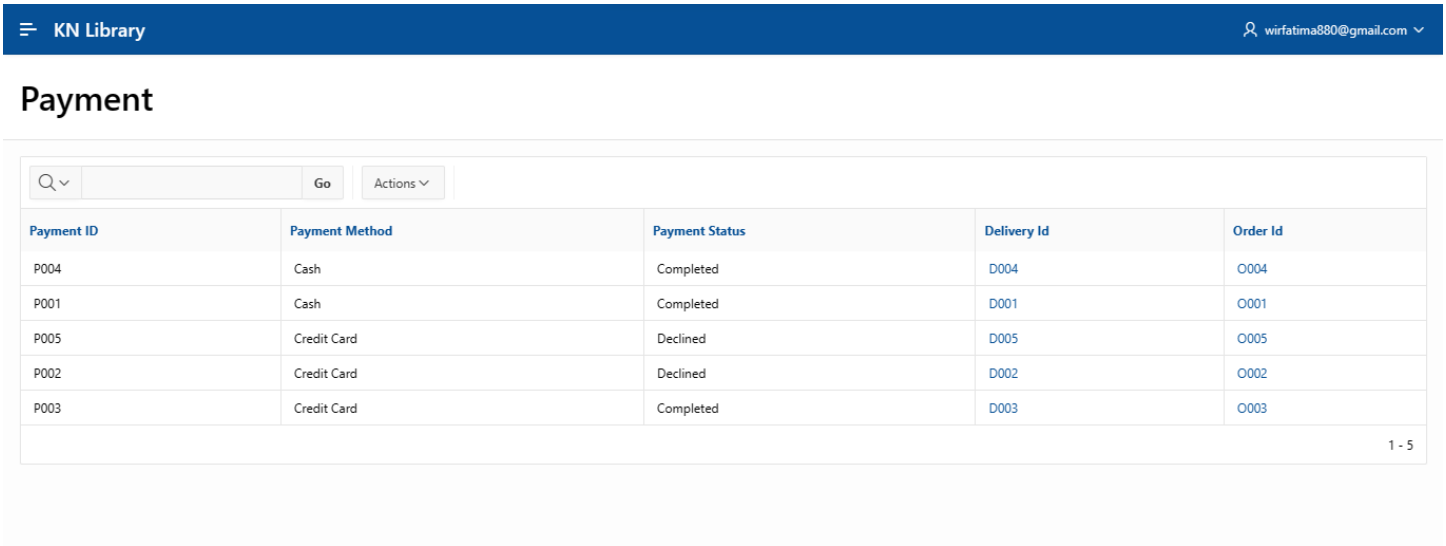
- This page displays all requests in the library for each member. It is also possible to view the details of the book by clicking on the book ID to display the details about the book, or view more details for the member by clicking on the member ID.

8.10. Delivery Page



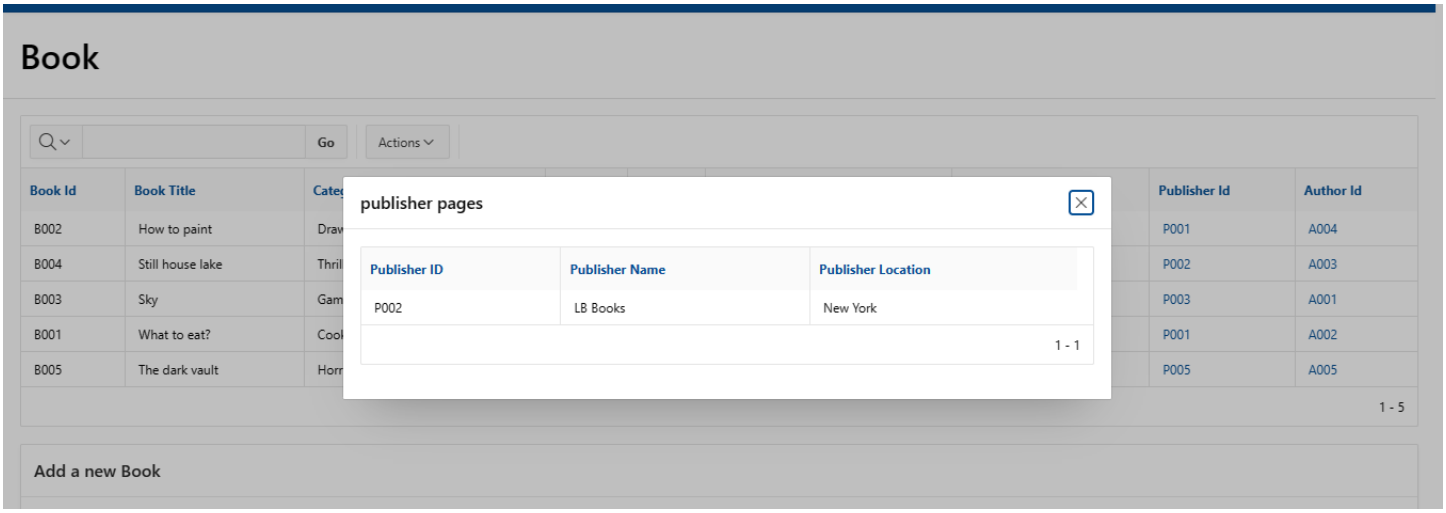
- This page is dedicated to showing delivery details for each member. Employees can display the details of an order by clicking the order ID.

8.11. Payment Page



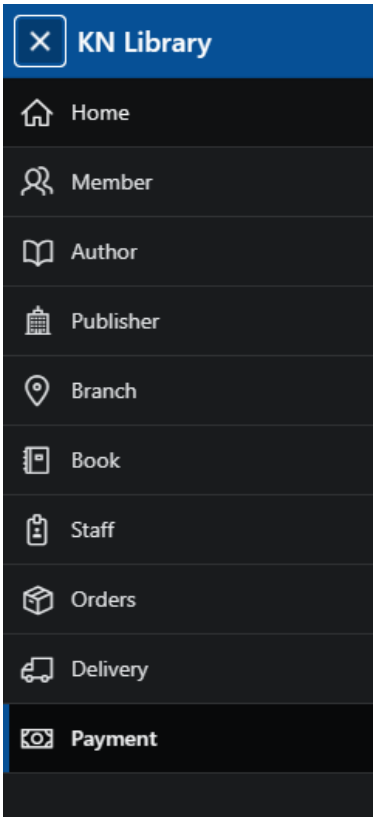
- The payment page displays the full details for each payment. Employees are allowed to display details for Delivery or Order when they press the ID without moving to another page.

8.12. View Details:



- This action is dependent on the foreign key relationship between book with publisher and book with author. So, we use links between pages. When employees press ID, they can display the full details from another table.

8.13. Menu (navigation bar)



- This simple navigation bar, allows employees to move quickly to the pages.

9. Conclusion

In the end, when the library used a manual system, tasks were difficult to complete because of data duplication, inconsistent customer data, and slow performance. However, after a database system was implemented, everything changed: customer data is now more secure, performance is better, redundancy is decreased, more consistency and privacy are provided, as well as backup and recovery options, which make it easier for the employees to search and store customer data as well as protect the data from any risks.

Contribution of each member:

Name	Task
Jenan Moh'd Jawad - 20194017	1- Background 2- Problem description
Fatema Jaafar Ahmed - 202002065	1- ER Model 2- Queries
Fatema Hussain Habib - 20192408	1- Introduction 2- Project Objectives 3- EER Model 4- Application
Manar Eyad Ahmed - 202006306	1- Data Dictionary 2- Normalization 3- Table's Values 4- SQL Statements 5- Conclusion