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Modernize Library Management System

Microsoft® SQL Server®

INTRODUCTION

OUR MODERNIZE LIBRARY MANAGEMENT SYSTEM AIMS TO REVOLUTIONIZE TRADITIONAL LIBRARY OPERATIONS. BY DIGITIZING CATALOGING SYSTEMS AND AUTOMATING BORROWING PROCESSES, WE ENHANCE ACCESSIBILITY TO RESOURCES. THIS USER-CENTRIC APPROACH PROMISES TO STREAMLINE OPERATIONS AND MEET THE EVOLVING NEEDS OF LEARNERS AND RESEARCHERS, USHERING LIBRARIES INTO THE DIGITAL AGE. JOIN US AS WE TRANSFORM THE FUTURE OF LIBRARY MANAGEMENT

Key Objectives

Digitize Cataloging: Implement digital cataloging systems to streamline book inventory management and improve search functionalities.

Automate Borrowing: Develop automated borrowing processes to facilitate quick and efficient lending of library materials

Enhance Accessibility: Improve access to resources by integrating digital lending platforms and expanding digital collections.

Optimize User Experience: Enhance user experience through intuitive interfaces, personalized recommendations, and user-friendly features


ARE YOU READY
TO EXPLORE ?

Problem Statement:

Our college library, currently managed manually, serves a diverse community of student borrowers andadministrative staff. However, reliance on physical records impedes efficiency, accessibility, and data security. To address these challenges, we advocate for the implementation of a digital library management system. By digitizing records,enhancing accessibility, and integrating automation, we aim to optimize resource utilization, streamline operations, and ensure the confidentiality of borrower information. This modernization effort will not only improve administrative efficiencybut also enhance the overall learning experience for our college community.

The integration of the library environment into a database is essential for modernizing the Library Management System, a computer-based application designed to automate library operations. This system enables librarians to efficiently manage information regarding books, magazines, and other materials within the library. Additionally, it facilitates the organization and maintenance of borrower information. The project's primary objectives revolve around automating key processes, including the addition of newly acquired books, management of borrowing activities and borrower details, book returns, location searches, and inventory printing. Through this initiative, we aim to enhance operational efficiency, streamline library management, and improve the overall user experience for both librarians and borrowers.

Views

Store

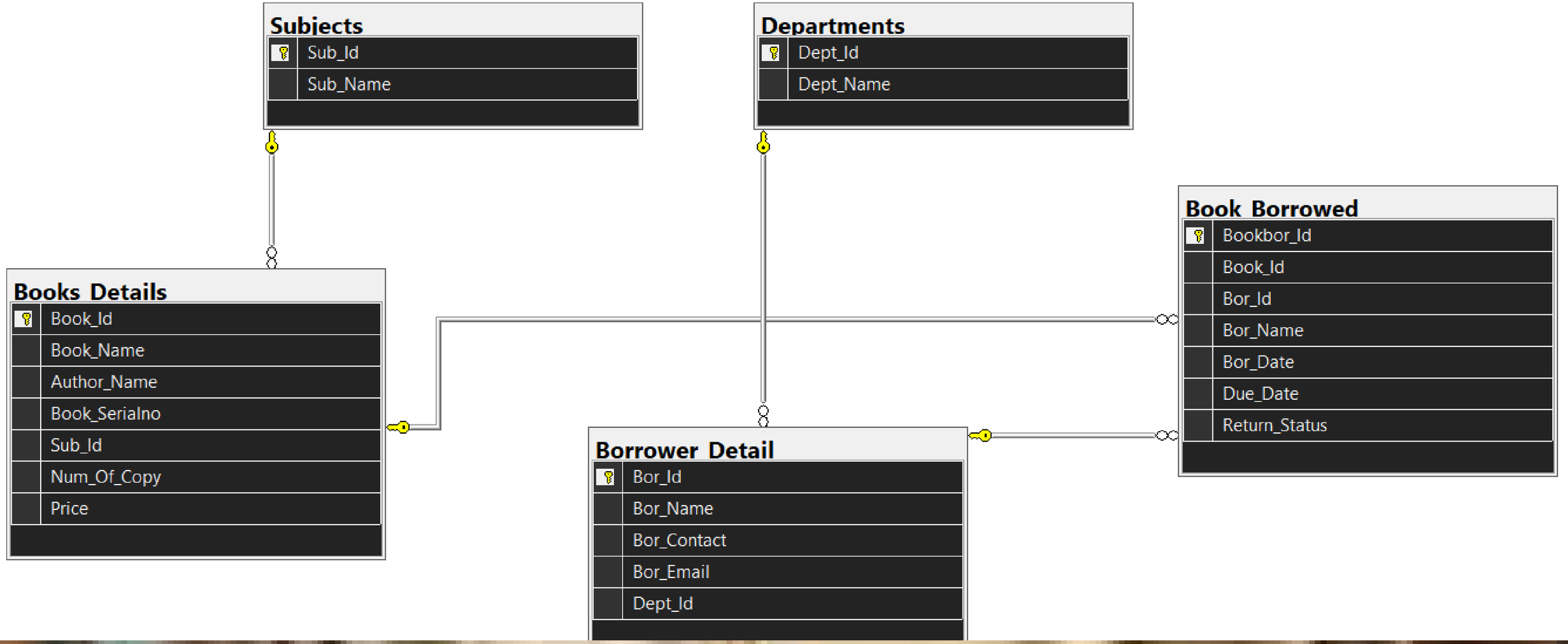
Procedure

Views: Views provide customized perspectives of the database, presenting data in a structured format tailored to specific user needs. For instance, we use views to display consolidated information about book details, borrower details, and borrowed book details. This ensures efficient data retrieval and enhances user experience by presenting relevant information in a user-friendly manner

Stored Procedures: Stored procedures encapsulate complex SQL queries and business logic into reusable units of code. In our project, stored procedures are used for various tasks such as borrowing books, adding new books to the library inventory, and registering new members. By centralizing these operations within stored procedures, we ensure consistency, security, and maintainability of database interactions, thereby enhancing the overall reliability and performance of the system.

Empower librarians with simplified database interactions: leverage views for clear data presentation and stored procedures for seamless execution of common tasks, eliminating the need for complex SQL queries and minimizing operational challenges

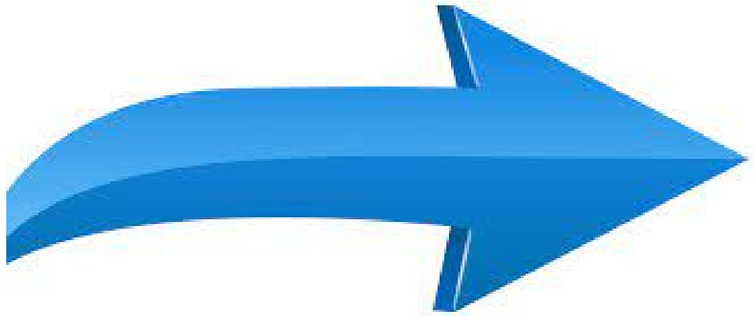
Schema & Table



View Report 01

As a librarian, one of my key responsibilities is to ensure that our library patrons have easy access to the books they need. To facilitate this, I've created a comprehensive report that provides essential details about our library's collection.

```sql
CREATE VIEW Book_Report AS
SELECT
    bd.Book_Name,
    bd.Author_Name,
    s.Sub_Name AS Subject_Name,
    bd.Price
FROM
    Books_Details AS bd
JOIN
    Subjects AS s ON bd.Sub_Id = s.Sub_Id
```



Note - The View has been created but Librarian need not to write this complex code .

Solution

```
SELECT * FROM Book_Report --(Now, Librarian can query this view to retrieve the required information
--without needing to know the underlying database schema or SQL syntax)
```

Results | Messages

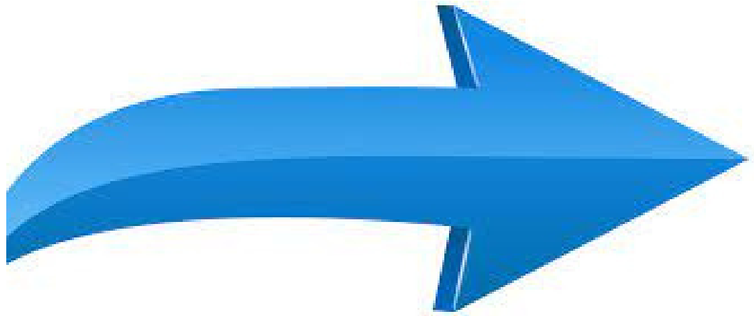
	Book_Name	Author_Name	Subject_Name	Price
1	Introduction to Algorithms	Thomas H. Cormen	Computer Science	49.99
2	The Physics Book	Clifford A. Pickover	Physics	29.99
3	Calculus: Early Transcendentals	James Stewart	Mathematics	39.99
4	A Brief History of Time	Stephen Hawking	Physics	24.99
5	To Kill a Mockingbird	Harper Lee	Literature	19.99
6	The Art of War	Sun Tzu	Art	14.99
7	The Elements of Style	William Strunk Jr.	Literature	9.99
8	Organic Chemistry	Paula Yurkanis Bruice	Chemistry	34.99
9	Introduction to Engineering	Wendy Hamrick	Engineering	44.99
10	Geography: Realms, Regions, and Concepts	Harm J. De Blij	Geography	29.99
11	The Great Gatsby	F. Scott Fitzgerald	Biology	56.99

This View report Shows Book_Name, Authore_Name, Subject_Name, Book_Price

View Report 02

I've designed a streamlined view presenting borrower names, contacts, department affiliations, and emails. This simplifies communication and management, ensuring efficient borrower interactions and enhancing library services.

```sql
CREATE VIEW Borrower_Report AS
SELECT
    bd.Bor_Name AS Borrower_Name,
    bd.Bor_Contact AS Borrower_Contact,
    d.Dept_Name AS Department_Name,
    bd.Bor_Email AS Email
FROM
    Borrower_Detail AS bd
JOIN
    Departments AS d ON bd.Dept_Id = d.Dept_Id
```



Note - The View has been created but Librarian need not to write this complex code .

Solution

```
SELECT * FROM Borrower_Report --(Now, Librarian can query this view to retrieve the required
--information of borrower without needing to know the underlying database schema or SQL syntax.)
```

Results | Messages

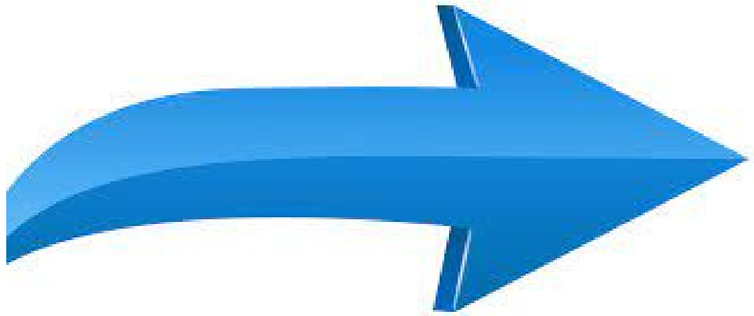
	Borrower_Name	Borrower_Contact	Department_Name	Email
1	John Smith	123-456-7890	Computer Science	john.smith@example.com
2	Emily Johnson	234-567-8901	Mathematics	emily.johnson@example.com
3	Michael Brown	345-678-9012	Literature	michael.brown@example.com
4	Emma Davis	456-789-0123	Physics	emma.davis@example.com
5	Daniel Wilson	567-890-1234	History	daniel.wilson@example.com
6	Sophia Martinez	678-901-2345	Biology	sophia.martinez@example.com
7	William Taylor	789-012-3456	Chemistry	william.taylor@example.com
8	Olivia Anderson	890-123-4567	Engineering	olivia.anderson@example.com
9	Liam Thomas	901-234-5678	Art	liam.thomas@example.com
10	Ava Garcia	012-345-6789	Geography	ava.garcia@example.com
11	John Doe	15467897	Physics	john.doe@example.com

This View report Shows Bor_Name, Bor_contact, Dept_Name, Email -ID

View Report 03

I've developed a comprehensive view showcasing borrowed book details: Book Name, Borrower Name, Contact, Author, Borrowed Date, and Due Date. This facilitates efficient book tracking and patron communication, ensuring seamless library operations.

```sql
CREATE VIEW Borrowed_Books_Report AS
SELECT
    bd.Book_Name AS Book_Name,
    brd.Bor_Name AS Borrower_Name,
    brd.Bor_Contact AS Borrower_Contact,
    bd.Author_Name AS Author_Name,
    bb.Bor_Date AS Borrowed_Date,
    bb.Due_Date AS Due_Date
FROM
    Book_Borrowed AS bb
JOIN
    Books_Details AS bd ON bb.Book_Id = bd.Book_Id
JOIN
    Borrower_Detail AS brd ON bb.Bor_Id = brd.Bor_Id
```



Note - The View has been created but Librarian need not to write this complex code .

Solution

```
SELECT * FROM Borrowed_Books_Report --(Now, Librarian can query this view to retrieve the required
--Borrowed_Book_Report without needing to know the underlying database schema or SQL syntax.)
```

Results | Messages

	Book_Name	Borrower_Name	Borrower_Contact	Author_Name	Borrowed_Date	Due_Date
1	Introduction to Algorithms	John Smith	123-456-7890	Thomas H. Cormen	2024-05-01	2024-06-01
2	The Physics Book	Emily Johnson	234-567-8901	Clifford A. Pickover	2024-05-03	2024-06-03
3	Calculus: Early Transcendentals	Michael Brown	345-678-9012	James Stewart	2024-05-05	2024-06-05
4	A Brief History of Time	Emma Davis	456-789-0123	Stephen Hawking	2024-05-07	2024-06-07
5	To Kill a Mockingbird	Daniel Wilson	567-890-1234	Harper Lee	2024-05-09	2024-06-09
6	The Art of War	Sophia Martinez	678-901-2345	Sun Tzu	2024-05-11	2024-06-11
7	The Elements of Style	William Taylor	789-012-3456	William Strunk Jr.	2024-05-13	2024-06-13
8	Organic Chemistry	Olivia Anderson	890-123-4567	Paula Yurkanis Br...	2024-05-15	2024-06-15
9	Introduction to Engineering	Liam Thomas	901-234-5678	Wendy Hamrick	2024-05-17	2024-06-17
10	Geography: Realms, Regions, ...	Ava Garcia	012-345-6789	Harm J. De Blij	2024-05-19	2024-06-19

This View report Shows Book_Name, Bor_Name, Bor_Contact, Author_Name, Bor_Date, Due_Date

Store Procedure 01

I've implemented a user-friendly procedure for borrowing books, swiftly adding entries to the BookBorrowed table. This ensures seamless transaction processing, enhancing borrower experience and optimizing library operations.

1. EXEC BorrowNewBook 'To Kill a Mockingbird', 'John Smith' --(Validated and Entry done Successfully)

2. EXEC BorrowNewBook 'The Art Of Living', 'John Smith' --(Error-Book does not exist in the library:The Art Of Living)

3. EXEC BorrowNewBook 'The Art of War', 'Sirgeo' --(Error -Not a member of the library: Sirgeo)

4. EXEC BorrowNewBook 'One night @ Call Center', 'Chao' --(Error! Neither the book nor the borrower exists in the library)

Note- Explore the SQL query for our stored procedure on my GitHub repository. Witness how librarians effortlessly execute the query to add entries in the BookBorrowed table. Learn how they adeptly handle errors during entry, ensuring smooth library operations

Store Procedure 02

Introducing a streamlined procedure to register new library members, seamlessly adding entries to the BorrowerDetails table. Empower librarians to efficiently manage patron registrations and enhance library services with ease.

1. EXEC RegisterNewMember 'John Doe',15467897,'john.doe@example.com',2 --(New member successfully registered in the library)

2. EXEC RegisterNewMember '',15467897,'john.doe@example.com',2 -(-Error! Borrower name cannot be empty)

3. EXEC RegisterNewMember 'John Doe','','john.doe@example.com',2 --Error! Borrower contact cannot be empty.

4. EXEC RegisterNewMember 'John Doe',15467897,'',2 --Error! Borrower email cannot be empty.

Note- Explore the SQL query for our stored procedure on my GitHub repository. Witness how librarians effortlessly execute the query to add entries in the BookBorrowed table. Learn how they adeptly handle errors during entry, ensuring smooth library operations

Store Procedure 03

Presenting a simplified procedure to enrich our library collection, effortlessly adding entries to the BookDetails table. Empower librarians to expand our offerings and enhance the reading experience for our patrons

1. EXEC AddNewBook 'The Great Gatsby','F. Scott Fitzgerald','XYZ456',6,5,56.99
   (Librarian Have these detils to Add a new book in Book_Details, New book successfully added)

2. EXEC AddNewBook '','F. Scott Fitzgerald','XYZ456',6,5,56.99
   (Error! Book name cannot be empty)

3. EXEC AddNewBook 'The Great Gatsby','','XYZ456',6,5,56.99
   (Error! Author name cannot be empty.)

Note- Explore the SQL query for our stored procedure on my GitHub repository. Witness how librarians effortlessly execute the query to add entries in the BookBorrowed table. Learn how they adeptly handle errors during entry, ensuring smooth library operations


Conclusions

In conclusion, our project has revolutionized library management through the implementation of intuitive views and stored procedures. Librarians now benefit from streamlined processes, with views providing clear data presentation and stored procedures automating common tasks. All SQL syntax updates are documented on GitHub (https://github.com/TripathyRohit), enabling easy reference and fostering collaborative enhancements for the future. That wraps up the project summary! If you need anything else or have further questions, feel free to ask.

THANK YOU!