C.V. RAMAN GLOBAL UNIVERSITY

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

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DBE CASE STUDY

REPORT

ON

UNIVERSITY LIBRARY MANAGMENT

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**DECLARATION**

I, Sudhanshu Kumar, hereby declare that I have done a case study on the topic of "**University Library Management System**". The purpose of this case study is to understand the management system adopted by C.V Raman Global University and its effectiveness in achieving the objectives of the library.

I confirm that all information and data collected during the course of this case study will be used solely for academic purposes and will be kept confidential.

I understand that this declaration is a formal statement of my commitment to academic integrity and ethical research practices.

**ACKNOWLEDGEMENT**

I would like to express my sincere gratitude to the following individuals and organizations for their invaluable support and guidance throughout this project:

First and foremost, I would like to thank my teacher, **Mrs. Soumya Sahoo** ma’am, for his constant support, encouragement, and valuable feedback throughout this project. her expertise and guidance were invaluable in ensuring the success of this project.

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**ABSTRACT**

The university library management system is a computer system designed to manage and automate the work of the university library.

This case study aims to analyze the implementation and impact of the library management system at CV Raman Global University. The study explores the challenges faced by the university before the implementation of the library system, such as inefficient processes, lack of transparency, and difficulty in data management.

The system enables library staff to perform various tasks such as book acquisition, cataloguing, circulation and inventory management. The system also has functions for searching and ordering books, generating reports and tracking late shipments. With the help of a university library management system, the library can effectively manage its resources and provide better services to users. This summary provides a brief overview of the system and its features.

**INTRODUCTION**

A university library management system is software designed to manage various aspects of a university library. This system typically includes functions such as cataloguing, distribution, retrieval, and reporting. It is used to automate various functions of the library and improve the overall efficiency of the library. The main purpose of the university library management system is to ensure easy access to library resources and services for students, faculty and staff. This system allows users to search and access library materials such as books, journals and other resources in both physical and electronic form. It also allows users to reserve materials, view materials and new loans online. The important features of the university library management system are also the management of acquiring and ordering new materials and monitoring the movement of materials in the library. This system can also provide analytical reports on library usage and trends, helping librarians make informed decisions about collection development and resource allocation. In short, a university library management system is an important tool for all educational institutions that want to make their libraries more efficient, improve the availability of resources and provide better services to users.

**A FEASIBILITY STUDY AND REQUIREMENT ANALYSIS**

**Feasibility study:**  
A feasibility study is conducted to assess the feasibility and practicality of a proposed project or system. For library management systems, two main aspects of feasibility are considered:  
Technical feasibility and economic feasibility.  
  
**Technical feasibility:**  
Technical feasibility checks whether the proposed library management system can be implemented with the available technical infrastructure and resources. Evaluate factors such as:  
  
**Hardware and software requirements:**  
Determine if the necessary hardware and software components such as servers, computers, databases, network infrastructure are available or can be obtained within the constraints of the project.  
 **Scalability:**  
Evaluate whether the system can handle the expected volume of users, books, and transactions while maintaining an acceptable level of performance. Consider future growth and your ability to meet increasing demand.  
  
**Ability to integrate:**  
Evaluate system compatibility with existing systems and databases within the library or other affiliated institution. Determine if integration is feasible and if additional development or customization is required.

**Safety:**  
Evaluate the security measures necessary to protect your system from unauthorized access, data breaches, and other potential risks. This includes user authentication, data encryption, and regular backups.

**Economic:**  
Economic feasibility determines whether implementing a library management system is economically viable and beneficial. This includes an analysis of costs and benefits associated with the project. Key considerations are:  
  
**Cost estimate:**  
Determine the initial investment required for hardware, software, licenses, development, training, and ongoing maintenance or support costs. Consider both one-time costs and recurring costs over the expected life of the system.  
  
**Return on Investment (ROI):**  
Evaluate the potential benefits the system will bring to the library. This includes increased efficiency, better utilization of resources, reduced operating costs, improved user experience, late fees, fines, and increased revenue from subscriptions and other services. Calculate expected ROI and payback time.  
  
**Cost-benefit analysis:**  
Compare projected benefits with estimated costs to determine if the benefits outweigh the investment. Consider potential risks and uncertainties as well as tangible and intangible benefits.  
  
**Requirements analysis:**  
During the requirements analysis, specific requirements and features of the library management system are identified and documented. It helps define project scope and control system development. His two main types of requirements are:  
Functional and non-functional requirements.  
  
**Functional requirements:**  
Functional requirements describe specific tasks, functions, and functions that a library management system must perform. Examples of library management system functional requirements are:  
  
**User registration and authentication:**  
Allow library staff and patrons to create accounts, authenticate their identities, and gain access to the system.  
  
**Cataloguing and managing books:**  
Allows libraries to add, update, and remove books from the system. This includes details such as title, author, ISBN and availability. Check-in and check-out:  
Make it easy for users to check out and return books, including tracking deadlines, issuing reminders, and handling fines and penalties.  
  
**Reservation/waiting management:**  
Allows users to reserve or reserve books that are not currently available and notify them when the books become available.  
  
**Search and retrieve:**  
It provides users with an efficient search interface that allows them to search for books based on various criteria such as title, author, subject, keywords, etc. Get relevant information about books and check availability.  
  
**Reporting and Analysis:**  
Generate reports on book circulation, user activity, inventory status, and other relevant metrics to support your library.

**TABLE DESCRIPTION WITH ALL CONSTRAINTS**

**ALL CONSTRAINTS**

1. CONSTRAINT PK\_Vendor PRIMARY KEY (SHOP\_ID),
2. CONSTRAINT CHK\_INCOM CHECK (INCOM >= 0),
3. CONSTRAINT CHK\_NUM\_BOOK CHECK (NUM\_BOOK >= 0)
4. CONSTRAINT PK\_Author PRIMARY KEY (LIC\_NO)
5. CONSTRAINT chk\_price CHECK (PRICE >= 0)
6. CONSTRAINT PK\_Library PRIMARY KEY (LIBNUM),
7. CONSTRAINT CHK\_Capacity CHECK (CAPACITY >= 0),
8. CONSTRAINT CHK\_NumStaff CHECK (NUM\_STAFF >= 0)
9. CONSTRAINT PK\_Librarian PRIMARY KEY (EMPID)

10.CONSTRAINT PK\_Admin PRIMARY KEY (USERID)

**DESIGN ER DIAGRAM**

**RELATIONAL DATABASE SCHEMA**

**NORMALIZED TABLE (UP TO 2NF)**

Teacher (SSN, Name, Subject, Age, Salary):

* SSN -> Name, Subject, Age, Salary (Assuming SSN is the unique identifier for a teacher, and each SSN determines the corresponding Name, Subject, Age, and Salary values)

Publisher (LIC\_NUM, NAME, NUM\_BOOK, GENRES):

* LIC\_NUM -> NAME, NUM\_BOOK, GENRES (Assuming LIC\_NUM is the unique identifier for a publisher, and each LIC\_NUM determines the corresponding Name, Num\_Book, and Genres values)

Vendor (SHOP\_ID, LOCATION, INCOM, NUM\_BOOK, NO\_AUTH):

* SHOP\_ID -> LOCATION, INCOM, NUM\_BOOK, NO\_AUTH (Assuming SHOP\_ID is the unique identifier for a vendor, and each SHOP\_ID determines the corresponding Location, Income, Num\_Book, and No\_Auth values)

Author (LIC\_NO, NUM\_BOOK, NAME):

* LIC\_NO -> NUM\_BOOK, NAME (Assuming LIC\_NO is the unique identifier for an author, and each LIC\_NO determines the corresponding Num\_Book and Name values)

Book (BOOKID, NAME, AUTHOR, EDITION, PRICE):

* BOOKID -> NAME, AUTHOR, EDITION, PRICE (Assuming BOOKID is the unique identifier for a book, and each BOOKID determines the corresponding Name, Author, Edition, and Price values)

Library (LIBNUM, NAME, CAPACITY, BLOCK, NUM\_STAFF):

* LIBNUM -> NAME, CAPACITY, BLOCK, NUM\_STAFF (Assuming LIBNUM is the unique identifier for a library, and each LIBNUM determines the corresponding Name, Capacity, Block, and Num\_Staff values)

Student1 (REG, NAME, ADDRESS, BRANCH, SEM):

* REG -> NAME, ADDRESS, BRANCH, SEM (Assuming REG is the unique identifier for a student, and each REG determines the corresponding Name, Address, Branch, and Sem values)

Librarian (EMPID, NAME, AGE, SALARY, ADDRESS):

* EMPID -> NAME, AGE, SALARY, ADDRESS (Assuming EMPID is the unique identifier for a librarian, and each EMPID determines the corresponding Name, Age, Salary, and Address values)

Admin (USERID, NAME, USERNAME, PASSWORD, ADDRESS):

* USERID -> NAME, USERNAME, PASSWORD, ADDRESS (Assuming USERID is the unique identifier for an admin, and each USERID determines the corresponding Name, Username, Password, and Address values)

To normalize the given set of tables up to 2nd Normal Form (2NF), we need to eliminate any partial dependencies. Here's the step-by-step normalization process:

Step 1: Analyse the tables for functional dependencies and determine the primary keys.

The primary keys for each table are as follows:

* Teacher: SSN
* Publisher: LIC\_NUM
* Vendor: SHOP\_ID
* Author: LIC\_NO
* Book: BOOKID
* Library: LIBNUM
* Student1: REG
* Librarian: EMPID
* Admin: USERID

Step 2: Identify and remove any partial dependencies.

Based on the given tables, there don't appear to be any partial dependencies that need to be addressed.

Step 3: Ensure that each non-key attribute depends on the whole primary key.

Let's examine each table to confirm:

Teacher (SSN, Name, Subject, Age, Salary):

* No partial dependencies.

Publisher (LIC\_NUM, NAME, NUM\_BOOK, GENRES):

* No partial dependencies.

Vendor (SHOP\_ID, LOCATION, INCOM, NUM\_BOOK, NO\_AUTH):

* No partial dependencies.

Author (LIC\_NO, NUM\_BOOK, NAME):

* No partial dependencies.

Book (BOOKID, NAME, AUTHOR, EDITION, PRICE):

* No partial dependencies.

Library (LIBNUM, NAME, CAPACITY, BLOCK, NUM\_STAFF):

* No partial dependencies.

Student1 (REG, NAME, ADDRESS, BRANCH, SEM):

* No partial dependencies.

Librarian (EMPID, NAME, AGE, SALARY, ADDRESS):

* No partial dependencies.

Admin (USERID, NAME, USERNAME, PASSWORD, ADDRESS):

* No partial dependencies.

**CONCLUSION**

In summary, library management systems play an important role in organizing and streamlining library operations. Benefits include efficient cataloging, streamlined distribution processes, and improved user experience. Library management systems greatly improve the overall efficiency and effectiveness of library operations by automating a variety of tasks such as cataloging, inventory tracking, membership management, and facilitating online access to resources.

One of the main advantages of library management systems is their ability to improve the user experience. Users can easily search, reserve, update articles, and access digital resources for books and other materials through an intuitive online catalog. This simplifies finding and borrowing materials, increasing user satisfaction and retention.

In summary, library management systems are essential tools for modern libraries. It streamlines library operations, improves user experience, improves data accuracy and security, and provides valuable insights for decision making. By leveraging technology and leveraging the capabilities of library management systems, libraries can continue to play a vital role in facilitating knowledge sharing, learning and cultural enrichment in today's digital age.

**REFERENCES**

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   * "Introduction to Modern Information Retrieval" by G. G. Chowdhurry
   * "Library Automation: Core Concepts and Practical Systems Analysis" by Dania Bilal
2. **Research Papers and Articles:**
   * "Design and Implementation of Library Management System" by R.S. Pawar and S.D. Kawade
   * "Library Management System: A Review" by Rohit Gupta and Ashish Verma
   * "Library Management System: A Case Study of Developing a Web-based Library Portal" by Sufian Ahmad and M. E. Kabir
3. **Online Resources:**
   * The Library Management section on the American Library Association (ALA) website: <http://www.ala.org/tools/library-management>
   * The International Federation of Library Associations and Institutions (IFLA) website: <https://www.ifla.org/>
4. **Open Source Library Management Systems:**
   * Koha: <https://koha-community.org/>
   * Evergreen: <https://evergreen-ils.org/>
   * OpenBiblio: <https://www.openbiblio.eu/>