**“Craftique”**

**Artisan & Handmade Goods E-commerce Website**

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**MINI LAB PROJECT REPORT**

This Report Presented in Partial Fulfillment of the course **CSE312: Database Management System Lab in the Computer Science and Engineering Department**



### DAFFODIL INTERNATIONAL UNIVERSITY

**Dhaka, Bangladesh**

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## DECLARATION

We hereby declare that this lab project has been done by us under the supervision of **Md Shah Jalal**, **Senior Lecturer**, Department of Computer Science and Engineering, Daffodil International University. We also declare that neither this project nor any part of this project has been submitted elsewhere as lab projects.

**Submitted To:**



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## COURSE & PROGRAM OUTCOME

The following courses have course outcomes as following.

After completion of this course, students will be able to:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **COs** | **CO Statements** | **POs** | **Learning Domains** | **Knowledge Profile** | **Complex Engineering**  **Problem** | **Complex Engineering**  **Activities** |
| **CO1** | **Demonstrate** a comprehensive understanding of fundamental database management concepts, including the relational data model, normalization techniques,  and SQL basics. | **PO1** | **C2 A2 P2** | **K2 K3 K4 K8** | **EP1**  **EP4** |  |
| **CO2** | **Design, implement** and optimize relational databases, incorporating advanced SQL queries, indexing techniques and query optimization strategies. | **PO3** | **C3**  **A3**  **P3** | **K2**  **K3**  **K4**  **K6**  **K8** | **EP1**  **EP2**  **EP7** | **EA3** |
| **CO3** | Understand and **Analyze** security measures, distributed database architectures and emerging trends in database management, demonstrating an understanding of the broader context and challenges in the field. | **PO5** | **C4**  **A4**  **P3** | **K6** | **EP4** |  |

**Details can be found at:** [[LINK]](https://drive.google.com/file/d/1bf8WYNRtsksdjUIiEY6H1ROTJXrUadfR/view?usp=sharing)

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**Chapter 1**

# Introduction

### Introduction

In recent years, the demand for unique, handcrafted goods has grown significantly, as consumers increasingly value creativity, authenticity, and sustainability [[1].](https://www.researchgate.net/publication/325132814_Artisan_entrepreneurship_a_systematic_literature_review_and_research_agenda) To bridge the gap between local artisans and a broader customer base, Craftique is envisioned as an innovative e-commerce platform dedicated to showcasing and selling artisan and handmade products. This platform allows talented creators to reach customers beyond geographical barriers, offering them an opportunity to thrive in the digital marketplace while providing buyers with access to one-of-a-kind items.

### Motivation

The motivation behind this project stems from a desire to empower local artisans and support sustainable practices. Artisans often struggle to compete with large-scale manufacturers, facing challenges in marketing and distribution.[[2]](https://www.researchgate.net/publication/323821521_Entrepreneurial_artisan_products_as_regional_tourism_competitiveness) With Craftique, we aim to give these creators a digital space where their work can shine. Additionally, by promoting handmade goods, this platform contributes to reducing the environmental impact associated with mass production.

### Objectives

The primary objectives of the *Craftique* project are as follows:

* To design and implement a robust database system that can efficiently manage customers, sellers, products, orders, and payments.
* To ensure data integrity and smooth functionality through triggers, procedures, and views.
* To provide a scalable solution that can be extended into a full-fledged e-commerce website in the future.

### Project Outcome

The expected outcomes of the *Craftique* project are as follows:

* A robust and well-organized relational database system for managing all aspects of the e-commerce platform, including users, products, orders, and payments.
* Stored procedures for automating repetitive tasks such as adding, updating, and deleting records across different tables.
* Triggers to ensure data integrity and enforce business rules, such as maintaining stock levels and updating order statuses.
* Views to simplify data retrieval and provide actionable insights for managing customers, sales, and artisan performance.
* A scalable and flexible database design that can be integrated with a front-end interface in the future for a complete e-commerce solution.
* A foundation for empowering artisans and promoting their products to a wider audience through digital means.

**Chapter 2**

# Proposed Methodology/Architecture

### Requirement Analysis & Design Specification

#### Overview

#### The development of *Craftique* required careful planning and analysis to ensure the database supports the functional and non-functional requirements of an e-commerce platform for artisan and handmade goods. Key functionalities identified include user management (customers, sellers, delivery agents), product management (inventory, categories, discounts), and transactional features (orders, payments, reviews). Non-functional requirements included scalability, data consistency, and ease of data retrieval for reporting and analytics.

#### Proposed Methodology

#### The project followed these steps to design and implement the database:

#### Requirement Analysis:

#### Identified the key entities (e.g., customers, sellers, products, orders, etc.) and their relationships.

#### Determine the necessary operations for managing data, including adding, updating, and retrieving information.

#### Database Design:

#### Created an Entity-Relationship (ER) diagram to model the relationships between entities.

#### Converted the ER diagram into a relational schema.

#### Applied normalization to eliminate redundancy and ensure data integrity.

#### Here is the ER diagram we made:

#### ER Diagram of *Craftique* Database Management

#### 

#### Architecture Diagram / Flow Chart

#### Environment Setup as Availability of Code:

#### Github Repository Link of Code: To find the repository, click on the links below:

#### Kh Sadman Sakib (ID-0242220005101951):

#### <https://github.com/sakibsidha/DBMS_Project_Craftique/tree/main>

#### Ramesha Rawnok Haque (ID-0242220005101665):

#### <https://github.com/rawnok-18/DBMS_Craftique_Project/tree/main>

#### Tools Used: MySQL, phpMyAdmin, XAMPP.

1. MySQL Documentation. (n.d.). MySQL Reference Manual. Retrieved from <https://dev.mysql.com/doc/>
   * Official documentation for MySQL, providing insights into stored procedures, triggers, and views.
2. phpMyAdmin Documentation. (n.d.). phpMyAdmin Official Documentation. Retrieved from https://docs.phpmyadmin.net/
   * Guidance on using phpMyAdmin for database management.
3. XAMPP Documentation. (n.d.). XAMPP for Beginners. Retrieved from https://www.apachefriends.org/docs/
   * Instructions for setting up a local server environment

#### Database Implementation:

#### Designed and implemented tables in MySQL using XAMPP phpMyAdmin.

#### Added constraints like primary keys, foreign keys, and unique constraints for data accuracy.

#### Automation and Data Integrity:

#### Developed stored procedures for repetitive tasks such as adding new records and generating reports.

#### Created triggers to maintain data integrity, such as updating inventory after an order or validating data changes.

#### Designed views to simplify data retrieval for reporting purposes.

#### Testing criteria:

#### Tested all database operations, including queries, triggers, and procedures, to ensure correctness and efficiency.

#### Validated the system by simulating real-world scenarios such as order placement, payment processing, and inventory updates.

### Overall Project Plan

### The development of *Craftique* followed a structured and iterative approach:

### Phase 1: Requirement Gathering and Analysis

### Defined the scope of the project and identified key database features.

### Drafted an ER diagram to visualize entity relationships.

### Phase 2: Database Design and Implementation

### Designed tables and implemented them in MySQL.

### Wrote stored procedures for CRUD (Create, Read, Update, Delete) operations.

### Created triggers for automated tasks like maintaining inventory and order status updates.

### Phase 3: Testing and Debugging

### Performed testing on queries, procedures, and triggers to ensure correctness.

### Validated data consistency and accuracy in scenarios such as adding users, placing orders, and handling payments.

### Phase 4: Documentation and Report Preparation

### Documented the database schema, triggers, procedures, and views.

### Prepared screenshots from the XAMPP server for the implementation section.

**Chapter 3**

# Implementation and Results

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### Implementation

### The implementation of the Craftique project focused on designing and deploying a database system that manages various aspects of an e-commerce platform for artisan and handmade goods. The following steps were undertaken during the implementation:

### 3.1.1 Database Structure

### The database consists of multiple tables to manage key entities such as customers, products, sellers, orders, payments, and more. Each table is designed to ensure data consistency, avoid redundancy, and handle complex operations efficiently.

### 

### Tables:

### address:

### Address\_ID (PK),

### Customer\_ID (FK),

### Apartment\_Name,

### Apart\_No,

### Street\_Name,

### City;

### cart:

### Cart\_ID (PK),

### Customer\_ID (FK),

### Product\_ID (FK),

### Quantity,

### ItemTotal,

### GrandTotal;

### category:

### Category\_ID (PK),

### Category\_Name,

### Description;

### coupon:

### Coupon\_ID (PK),

### Coupon\_Code,

### Discount\_Value,

### Expiry\_Date;

### customer:

### Customer\_ID (PK),

### First\_Name,

### Last\_Name,

### Email,

### Phone,

### Age,

### DOB;

### delivery\_Agent:

### Agent\_ID (PK),

### Agent\_Name,

### Phone,

### Vehicle\_Type;

### discount:

### Discount\_ID (PK),

### Product\_ID (PK),

### Discount\_Percentage,

### Start\_Date,

### End\_Date;

### feedback:

### Feedback\_ID (PK),

### Customer\_ID (PK),

### Feedback\_Text,

### Feedback\_Date;

### inventory:

### Inventory\_ID (PK),

### Product\_ID (FK),

### Location,

### Quantity\_In\_Stock;

### notification:

### Notification\_ID (PK),

### User\_ID (FK),

### User\_Type,

### Notification\_Text,

### Notification\_Date,

### Is\_Read;

### order:

### Order\_ID (PK),

### Cart\_ID (FK),

### Customer\_ID (FK),

### Order\_Amount,

### Order\_Date,

### Shipping\_Date,

### Order\_Status;

### payment:

### Payment\_ID (PK),

### Order\_ID (FK),

### Customer\_ID (FK),

### Payment\_Mode,

### DateOfPayment;

### product:

### Product\_ID (PK),

### Product\_Name,

### Category\_ID (FK),

### Seller\_ID (FK),

### Brand,

### Stock,

### MRP;

### review:

### Review\_ID (PK),

### Customer\_ID (FK),

### Product\_ID (FK),

### Rating,

### Description;

### seller:

### Seller\_ID (PK),

### Seller\_Name,

### Seller\_Phone,

### Total\_Sales;

### shipment:

### Shipment\_ID (PK),

### Order\_ID (FK),

### Agent\_ID (FK),

### Shipment\_Date,

### Expected\_Delivery\_Date,

### Shipment\_Status;

### wishlist:

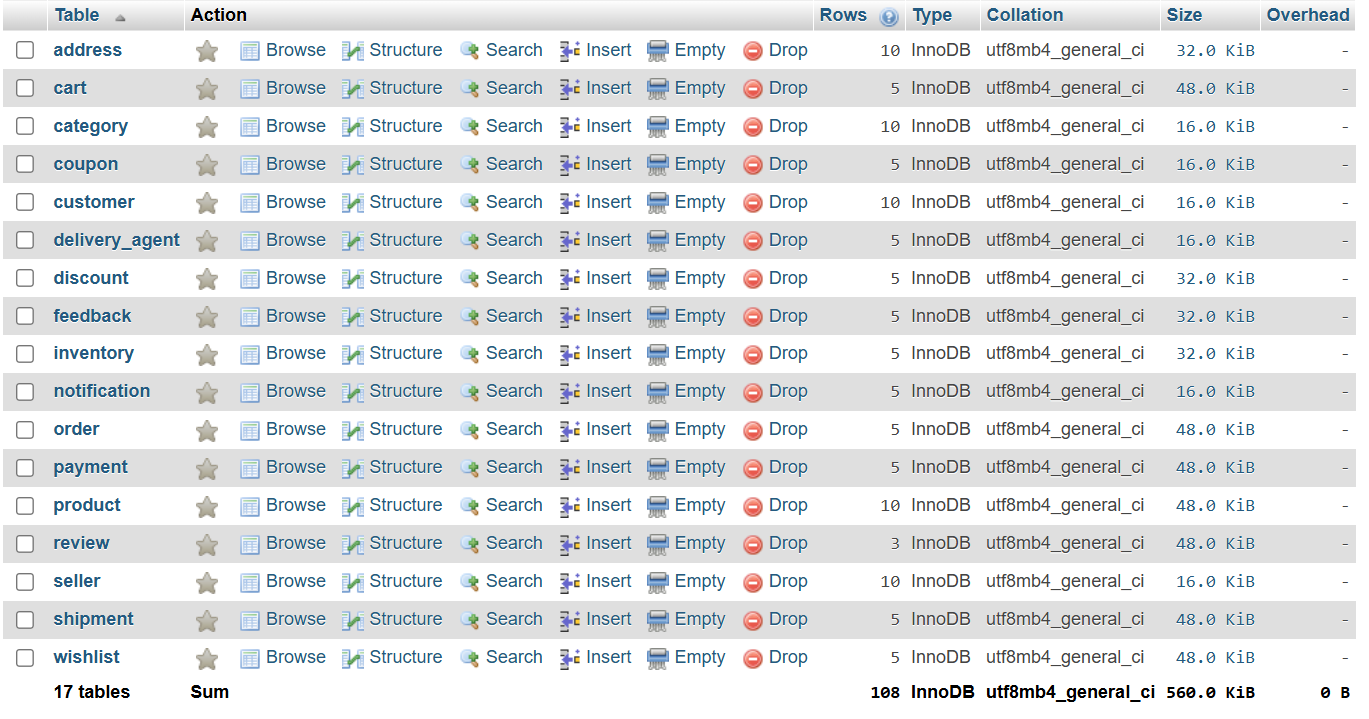
### Wishlist\_ID (PK),

### Customer\_ID (FK),

### Product\_ID (FK),

### Date\_Added;

### Here are some screenshots:

****

**Fig: Tables Of Database**

### 

### Fig: Address Table

### 

### Fig: Category Table

### 

### 

### Fig: Product Table

### 3.1.2 Stored Procedures

### Stored procedures were created to automate repetitive tasks and simplify database operations. Some of the key procedures include:

### Adding new customers, sellers, and products.

### Updating stock after a purchase.

### Generating sales and performance reports.

### 

### For example: The AddCustomer procedure allows easy insertion of customer data, ensuring no manual errors and maintaining uniformity across records.

### 

### DELIMITER //

### CREATE PROCEDURE AddCustomer(

### IN p\_FirstName VARCHAR(50),

### IN p\_LastName VARCHAR(50),

### IN p\_Email VARCHAR(100),

### IN p\_Phone VARCHAR(15),

### IN p\_Age INT,

### IN p\_DOB DATE

### )

### BEGIN

### INSERT INTO customer (First\_Name, Last\_Name, Email, Phone, Age, DOB)

### VALUES (p\_FirstName, p\_LastName, p\_Email, p\_Phone, p\_Age, p\_DOB);

### END //

### DELIMITER ;

### Here are some screenshots of the procedures we implemented.

### 

### 

**FIG: Procedure of Database**

### 

### Fig: Execute routine

### 

### Fig: Executed Statement

### 

### Fig: Customer Table

### 

### Fig: Procedure Parameters

### 3.1.3 Triggers

### Triggers were implemented to ensure data consistency and enforce business rules. Some examples include:

### Updating stock in the inventory table after a purchase is made.

### Automatically calculating cart totals when items are added or updated.

### Preventing deletion of a product if it is linked to an active order.

### For example:

### The AfterOrderInsert trigger updates inventory levels when a new order is placed.

### DELIMITER //

### CREATE TRIGGER AfterOrderInsert

### AFTER INSERT ON order

### FOR EACH ROW

### BEGIN

### UPDATE product

### SET Stock = Stock - (SELECT Quantity FROM cart WHERE Product\_ID = NEW.Product\_ID)

### WHERE Product\_ID = NEW.Product\_ID;

### END //

### DELIMITER ;

### Here are some screenshots:

### 

**Fig: Trigger Table**

### 

**Fig: Query Input**

### 

**Fig: Trigger Code (SQL Input)**

### 3.1.4 Views

### Views were created to simplify data retrieval and allow efficient reporting. Key views

### include:

### A view to track product performance (sales and reviews).

### A view showing customer order histories.

### A view to list top-selling products for artisan performance analysis.

### For example: The TopSellingProducts view displays products with the highest sales:

### CREATE VIEW TopSellingProducts AS

### SELECT p.Product\_ID, p.Product\_Name, SUM(o.Order\_Amount) AS Total\_Sales

### FROM product p

### JOIN order o ON p.Product\_ID = o.Product\_ID

### GROUP BY p.Product\_ID, p.Product\_Name

### ORDER BY Total\_Sales DESC;

### 

### Here are some screenshots of the views we implemented:

### 

### Fig: View Table (SQL Output)

### 

**Fig: View Code (Query Input)**

### 

### Fig: View table

### Performance Analysis

### To ensure the database is efficient and scalable, performance tests were conducted on key operations, including:

### Query execution time for retrieving large datasets, such as all orders placed in a given month.

### Efficiency of procedures when inserting bulk data.

### Trigger performance under frequent inventory updates during sales events.

### The results showed that:

### Indexing on primary and foreign keys significantly reduced query execution time.

### Using stored procedures minimized errors and increased efficiency.

### Proper normalization ensured smooth handling of large datasets without redundancy.

### Results and Discussion

The implementation successfully delivered a robust and scalable database system for *Craftique*. Key outcomes include:

* Seamless management of customers, products, and orders using structured tables.
* Automation of common tasks through stored procedures and triggers, improving efficiency and reducing human error.
* Simplified reporting and analytics through views, aiding in decision-making.

The system was tested for various scenarios such as adding new users, placing orders, and handling payments. All tests yielded correct results, validating the system’s functionality and reliability.

**Chapter 4**

# Engineering Standards and Mapping

**4.1 Impact on Society, Environment, and Sustainability**

**4.1.1 Impact on Life**

*Craftique* serves as a bridge between artisans and customers, creating significant societal value:

* **Empowering Artisans**: By providing a platform to showcase their talent, artisans gain access to a broader customer base, increasing their income and livelihood opportunities.
* **Customer Benefits**: Customers can access unique, high-quality handmade goods, promoting appreciation for craftsmanship.

**4.1.2 Impact on Society & Environment**

* **Social Impact**:
  + Promotes local businesses and supports rural economies, creating a ripple effect in society.
  + Encourages cultural preservation by bringing traditional crafts into mainstream commerce.
* **Environmental Impact**:
  + Focuses on handmade products, which have a lower carbon footprint compared to mass-produced items.
  + Reduces reliance on industrial manufacturing and fosters sustainable practices.

**4.1.3 Ethical Aspects**

*Craftique* adheres to ethical standards to ensure fair practices, such as:

* **Fair Trade**: Artisans receive a fair price for their work, promoting equitable growth.
* **Transparency**: Customers are provided with accurate information about the origin and materials of products.
* **Data Privacy**: The platform safeguards user data through secure database practices and encryption mechanisms.

**4.1.4 Sustainability Plan**

The project contributes to sustainability by:

* Reducing waste through the promotion of durable, handmade goods.
* Encouraging the use of natural or eco-friendly materials in the creation of artisan products.
* Building a scalable system that can adapt to future growth without compromising resource efficiency.

**4.2 Project Management and Team Work**

The development of *Craftique* adhered to established project management principles to ensure timely and successful delivery. The following practices were implemented:

**4.2.1 Task Breakdown and Planning**

The project was divided into key milestones:

1. **Requirement Analysis**: Understanding user needs and defining database requirements.
2. **Database Design**: Creating an ER diagram, relational schema, and normalization.
3. **Implementation**: Writing SQL scripts, developing procedures, triggers, and view
4. **Testing**: Ensuring all operations function correctly under various scenarios.
5. **Documentation**: Preparing a comprehensive project report.

**4.2.2 Collaboration and Team Roles**

Although this was an individual effort, collaboration principles were followed, simulating team scenarios:

* **Communication**: Regularly documenting progress and challenges.
* **Role Simulation**: Taking on roles such as database designer, developer, and tester to manage different aspects of the project.
* **Peer Feedback**: Sharing progress with peers for constructive feedback.

**4.2.3 Tools and Resources**

* **XAMPP**: Used to set up the MySQL database and phpMyAdmin for development and testing.
* **DBMS Concepts**: Applied principles of database normalization, indexing, and data integrity.
* **Documentation Tools**: Microsoft Word for report writing and Lucidchart for designing the ER diagram.

**Chapter 5**

# Conclusion

**5.1 Summary**

The *Craftique* project aimed to design and implement a database system for an e-commerce platform dedicated to artisan and handmade goods. Through systematic planning, implementation, and testing, the following were achieved:

* A robust database with well-structured tables to manage entities such as customers, products, sellers, orders, and shipments.
* Automation of critical processes using stored procedures and triggers, improving efficiency and reducing errors.
* Creation of views to facilitate reporting, analysis, and decision-making.
* Alignment with societal and environmental goals by promoting local artisans and sustainable practices.

This project not only serves as a functional database system but also demonstrates the application of database management principles in real-world scenarios.

**5.2 Limitations**

Despite its successful implementation, the project has some limitations:

1. **Lack of Frontend Integration**: The project focuses solely on the backend database and does not include a user interface for customers or administrators.
2. **Scalability Testing**: While the database is designed to handle growth, it has not been stress-tested under high transaction volumes.
3. **Payment Gateway Simulation**: The payment processing functionality is not integrated with real-world payment gateways, limiting its scope in actual deployment.

These limitations highlight areas for future improvement and expansion.

**5.3 Future Work**

The *Craftique* project provides a strong foundation for further development. Possible areas of improvement and expansion include:

* **Frontend Development**.
* **Scalability Enhancement.**
* **Integration with Payment Gateways.**
* **Advanced Analytics.**
* **Mobile Application.**

The *Craftique* project successfully demonstrates how a well-designed database system can support a niche ecommerce platform. It opens up numerous possibilities for future growth and scalability while maintaining its commitment to societal and environmental impact.

**SQL File Link:** [**[LINK]**](https://drive.google.com/file/d/16PDUJIGQqfJ2QMiG92mymjPHVwx4_Kjn/view?usp=sharing)

**Reference**

# [1] Artisan entrepreneurship: a systematic literature review and research agenda:

# [https://www.researchgate.net/publication/325132814\_Artisan\_entrepreneurship\_a\_systematic\_literature\_review\_and\_research\_agenda](https://www.researchgate.net/publication/325132814_Artisan_entrepreneurship_a_systematic_literature_review_and_research_agenda )

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[2]Entrepreneurial artisan products as regional tourism competitiveness:

<https://www.researchgate.net/publication/325132814_Artisan_entrepreneurship_a_systematic_literature_review_and_research_agenda>

**We thank you from the Team Laughter Crew.**

**The End.**