

KUTIR SHILPO: Single Vendor E-Commerce Web Site

BY

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FINAL YEAR DESIGN PROJECT REPORT

This Report Presented in Partial Fulfillment of the
Requirements for the **Degree of Bachelor of Science in
Computer Science and Engineering**

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APPROVAL

This Project titled “Kutir Shilpo: Single Vendor e-commerce web site”, submitted by Md Kamrul Hassan, 172-15-10251 to the Department of Computer Science and Engineering, Daffodil International University has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on **17 September, 2025**.

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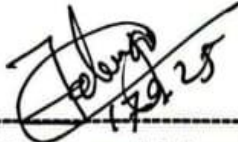
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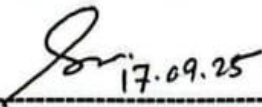
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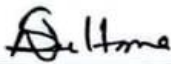
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DECLARATION

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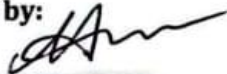
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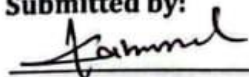
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ABSTRACT

KutirShilpo is an innovative e-commerce web platform dedicated to showcasing and promoting traditional Bangladeshi handicrafts. In today's digital era, many local artisans and small-scale producers struggle to access wider markets despite the cultural and economic value of their products. KutirShilpo addresses this gap by providing a centralized online marketplace where customers can easily explore, purchase, and manage authentic handmade goods. The platform has been developed using standard front-end technologies—**HTML, CSS, and JavaScript**—to ensure simplicity, flexibility, and cross-platform compatibility. Its design emphasizes **responsiveness and user-friendliness**, enabling a seamless shopping experience across desktops, tablets, and mobile devices. Core functionalities include product browsing, category-based filtering, cart management, user registration, and login. This thesis presents a detailed overview of the KutirShilpo project, covering the motivation behind the system, development methodology, design principles, implementation process, and testing procedures. The long-term vision for *KutirShilpo* includes the integration of advanced features such as secure online payment systems, delivery tracking, user reviews, and seller dashboards. These enhancements aim to evolve the platform into a fully scalable and sustainable e-commerce solution that empowers artisans while preserving the rich cultural heritage of Bangladesh.

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Chapter 1

Introduction

1.1 Introduction

The rise of e-commerce has revolutionized the retail landscape, providing people from all walks of life with seamless access to a diverse range of products and services through digital platforms. This transformation has redefined how individuals engage with technology and reshaped their shopping habits, moving away from traditional brick-and-mortar stores to the convenience of online marketplaces [1]. The Internet has not only facilitated global access to goods but has also significantly influenced consumer behavior, decision-making, and transactional processes [2]. Despite the dominance of major e-commerce platforms like Amazon, eBay, and regional players like Daraz, there remains an opportunity to create inclusive platforms that cater to diverse audiences with varying needs and preferences. "Kutir Shilpo" is a web-based e-commerce platform designed to bridge this gap by offering a versatile and inclusive shopping experience for people of all backgrounds.

"Kutir Shilpo" aims to provide a user-friendly and accessible platform that caters to everyone, from students and professionals to homemakers and entrepreneurs, ensuring that their unique needs are met with ease and efficiency. With features such as intuitive category-based filtering, flexible price range sorting, and a seamless cart system, "Kutir Shilpo" empowers users to make informed purchasing decisions while enjoying the convenience of online shopping [3]. By offering a tailored yet inclusive shopping experience, "Kutir Shilpo" aspires to become a trusted destination for individuals seeking affordability, variety, and relevance in their online shopping journey.

1.2 Motivation

The rapid growth of e-commerce has reshaped the retail industry, providing unparalleled access to a wide array of products and services through digital platforms. This evolution has transformed consumer behavior, enabling individuals to browse, compare, and purchase items conveniently from anywhere in the world [1]. The Internet has not only expanded access to global markets but has also significantly influenced how people shop, make transactions, and engage with online environments, distinct from traditional brick-and-mortar shopping experiences [2]. While major e-commerce platforms like Amazon, eBay, and regional services like Daraz have made shopping more accessible, they often fall short in addressing the diverse needs of all demographics, particularly in offering a tailored yet inclusive experience. This gap in the market inspired the creation of "Kutir Shilpo," a web-based e-commerce platform designed to serve people from all walks of life—students, professionals, homemakers, and beyond.

The motivation behind "Kutir Shilpo" stems from the need for an inclusive platform that prioritizes accessibility, affordability, and relevance for a broad audience. Unlike generic e-commerce solutions, "Kutir Shilpo" is built to cater to the unique preferences and requirements of its diverse user base, offering features like intuitive category-based filtering, price range sorting, and a seamless cart system to enhance the shopping experience [3]. By providing a platform that empowers users to make informed purchasing decisions with ease and confidence, "Kutir Shilpo" aims to redefine online shopping as an inclusive, user-centric journey that meets the needs of everyone, fostering convenience and variety in a single digital marketplace.

1.3 Objectives

The "KutirShilpo" project is driven by the following well-defined objectives:

- To design and develop a responsive e-commerce website with an intuitive interface that ensures seamless navigation across desktops, tablets, and smartphones for users of all backgrounds.
- To implement a robust cart management system utilizing local storage to persist user selections, providing a consistent and uninterrupted shopping experience.

- To integrate advanced filtering and sorting functionalities, enabling users to browse products by categories, price ranges, and other relevant criteria, thereby enhancing usability and product discovery.
- To ensure compliance with modern web standards, including cross-browser compatibility, fast page load times, and accessibility features to accommodate a diverse user base.
- To create a scalable and maintainable codebase that supports future enhancements, such as back-end integration, payment gateways, and user authentication, to expand the platform's functionality and reach.
- To examine the factors influencing e-commerce adoption across diverse demographics, drawing on the Technology Acceptance Model (Davis, 1989), to better understand user behavior and preferences in online shopping environments.

1.4 Methodology

The development of the "KutirShilpo" e-commerce platform adopts a structured and iterative methodology to ensure clarity, functionality, and user satisfaction across a diverse user base. The process began with comprehensive requirements gathering through observation and analysis of the needs of various demographics, including students, professionals, and homemakers, emphasizing affordability, ease of use, and relevance. This approach ensured the creation of an inclusive, user-focused e-commerce website aligned with both technical objectives and real-world use cases. The design phase involved crafting wireframes and mockups for the user interface, prioritizing responsive layouts and intuitive navigation to cater to users across devices. Frontend technologies, including HTML, CSS, and JavaScript, were employed in the development process, with a focus on scalability for future backend integration. Throughout the development cycle, unit testing, UI testing, and user feedback sessions were conducted to identify and resolve issues early, ensuring a robust and user-centric platform.

1.5 Project Outcome

The "KutirShilpo" project delivers a fully functional e-commerce platform tailored to meet the diverse needs of users from all walks of life, enabling them to browse, filter, and purchase a wide range of products with ease and affordability. The platform features a responsive design that seamlessly adapts to various screen sizes, ensuring accessibility across desktops, laptops, tablets, and smartphones. Key functionalities include category-based product filtering, price range sorting, a persistent cart system, and a mobile-friendly sidebar for enhanced navigation. The project produces a clean, maintainable, and scalable codebase, laying a strong foundation for future enhancements, such as:

- Implementation of payment gateways for secure transactions.
- Integration with a back-end database for dynamic product management.
- Addition of user authentication for personalized shopping experiences.

By addressing the unique preferences of a broad audience, "Kutir Shilpo" has the potential to significantly influence online shopping habits, particularly in regions with high internet adoption. For instance, studies indicate that a significant portion of internet users in various demographics, including young adults and professionals, actively embrace technology for online activities [6], underscoring the platform's relevance and impact.

1.6 Organization of the Report

This report is organized into six chapters, each addressing a specific aspect of the "Kutir Shilpo" project to provide a comprehensive understanding of its development, implementation, and future potential.

- **Chapter 1: Introduction** outlines the rise of e-commerce, its impact on consumer behavior, and the need for inclusive platforms. It introduces "Kutir Shilpo" as a solution tailored to diverse audiences, setting the stage for the project's purpose and scope.
- **Chapter 2: Motivation** explores the driving forces behind "Kutir Shilpo," highlighting the limitations of existing e-commerce platforms and the demand for an accessible, affordable, and user-centric shopping experience for all demographics.
- **Chapter 3: Objectives** details the specific goals of the project, focusing on designing a

responsive website, implementing key functionalities, ensuring web standards, and planning for future scalability while analyzing e-commerce adoption factors.

- **Chapter 4: Methodology** describes the structured approach to developing "Kutir Shilpo," including requirements gathering, design, frontend development with HTML, CSS, and JavaScript, and iterative testing to ensure a robust and inclusive platform.
- **Chapter 5: Project Outcome** presents the deliverables of the project, showcasing the functional e-commerce platform with responsive design, key features, and a scalable codebase, along with plans for future enhancements like payment gateways and backend integration.

Chapter 2

Background

2.1 Introduction

This chapter provides an overview of the foundational context for the Student Park platform. It explores related works, defines the scope of the project, and highlights key challenges that influence the system's design and implementation

2.2 Literature Review

The literature review examines existing research and applications related to e-commerce platforms for handicrafts, with a focus on Bangladesh. Below is a summary table of key studies:

Table 2.2.1: Literature Review

Author	Year	Title	Findings
Khandaker, Md.	2024	Catalysing Bangladeshi Handicrafts into the Finnish Market - A Comprehensive E-commerce Business Plan for CraftsHub	Develops a business plan for an e-commerce startup selling Bangladeshi handicrafts in Finland, highlighting market growth, product diversity, and strategies for online sales.
Bishwas, Mukul	2018	E-Commerce and Handicrafts in Bangladesh and India 2018	Overview of e-commerce options for craft producers, discussing barriers and recommendations for business-to-business opportunities to support artisans.
Not specified (Global Dev)	2021	Will e-commerce revive Bangladesh's artisanal economy	Explores digitization in Bangladesh's craft sector, emphasizing the need for labor laws, fair wages, and e-commerce apps to empower rural artisans,

			especially women.
Uddin, Md. Jafar et al.	2024	Export Potential of Handicraft Sector: Challenges and Way Forward	Analyzes export potential, challenges like lack of e-commerce competence, and opportunities in global online platforms like Amazon and Etsy for Bangladeshi handicrafts.
Nair, Amshitha Sajikumar et al.	2024	Unspoken Craft: e-commerce site for handlooms and handicrafts	Discusses development of an e-commerce site for Indian handicrafts, highlighting the role in supporting rural craftsmen; relevant parallels to Bangladesh's context.

2.2.1 Similar Applications

- **Global Platforms (e.g., Amazon, eBay)**
 - Offer extensive product ranges and sophisticated logistics, catering to a broad audience with advanced search and recommendation features [9].
 - However, they often prioritize mass-produced goods over artisanal products, lacking a focus on cultural specificity.
- **Regional Platforms (e.g., Daraz in Bangladesh)**
 - Provide a mix of local and international products, including some handicrafts [7].
 - Not tailored to highlight the unique value of Bangladeshi artisanal work, limiting their cultural relevance.
- **Global Artisanal Platforms (e.g., Etsy)**
 - Support artisans worldwide by offering a marketplace for handmade and vintage items [5].
 - May not fully address local market needs, such as language or payment preferences specific to Bangladesh.
- **Local Initiatives (e.g., Aarong)**

- Offer an online presence for fair-trade Bangladeshi handicrafts, functioning more as a branded store rather than a diverse marketplace [3].
- Focus on their own products, restricting the variety available to users.
- **Specialized Projects (e.g., Ava)**
 - Blend traditional craftsmanship with modern designs, selling via e-commerce [4].
 - Scope remains limited compared to a comprehensive marketplace, reducing their broad applicability.

2.2.2 Related Research

- **Design of E-Commerce Platforms for Handicrafts:** Research focuses on creating online systems that promote handmade goods, emphasizing accessibility and market reach for artisans.
- **E-Commerce Adoption in Developing Countries:** Studies highlight challenges such as digital literacy and infrastructure barriers faced by artisans in countries like Bangladesh when adopting e-commerce.
- **Digital Marketing for Artisanal Products:** Explores the use of online marketing strategies to expand the reach of handicraft markets.
- **Online Shopping Behavior:** Investigates consumer trust, preferences, and the influence of reviews in purchasing handicrafts in Bangladesh.
- **Development Using Front-End Technologies:** Covers the use of HTML, CSS, and JavaScript to build functional e-commerce sites with features like filtering and carts.
- **Localized E-Commerce Solutions:** Suggests that platforms targeting niche groups, such as handicraft producers, are more effective in addressing specific needs.
- **Security and Usability of Payment Systems:** Discusses integrating secure, cost-effective payment options suitable for small-scale transactions.
- **Accessible Web Design:** Focuses on designing inclusive platforms that cater to diverse user groups through accessibility standards.

2.3 Gap Analysis

This Table (2.3.1) shows Gap Analysis of KutirShilpo& Others

Table 2.3.1: Gap Analysis

Feature	Existing Platforms	KutirShilpo
Target Audience	General or global artisans	Diverse users, focus on Bangladeshi handicrafts
Pricing	Market-driven, often high	Affordable, supports local artisans
Product Focus	Broad, mass-produced	Authentic, culturally significant handicrafts
User Interface	Complex, feature-heavy	Intuitive, simplified design
Delivery Options	Standard, costly	Optimized for local and international shipping
Vendor Support	Limited for small artisans	Prioritizes Bangladeshi artisans
Filtering/Search	Generic filters	Category, price, craft-type filters
Accessibility	Varies	Adheres to accessibility standards
Cultural Integration	Minimal	Emphasizes Bangladeshi culture

2.4 Summary

"Kutir Shilpo" is designed as an inclusive e-commerce platform using HTML, CSS, and JavaScript, targeting a diverse audience with a focus on promoting Bangladeshi handicrafts. Unlike generic e-commerce sites, it addresses gaps by offering affordability, cultural relevance, and support for local artisans. Key features include category filtering, price sorting, and a persistent cart system within a responsive design. The literature review informs the platform's development by addressing e-commerce adoption, usability, and secure transactions. Future enhancements will include back-end integration, user authentication, and payment gateways to expand its functionality.

Chapter 3

Research Methodology

3.1 Requirement Analysis & Design Specification

The development of "Kutir Shilpo" begins with a thorough requirement analysis, identifying the needs of diverse users, including artisans and consumers of Bangladeshi handicrafts. This process involves stakeholder interviews, surveys, and observation to ensure the platform aligns with user expectations for accessibility, affordability, and cultural relevance

3.1.1 System Design

The system design focuses on creating a responsive e-commerce platform with an intuitive interface. Wireframes and mockups are developed to outline the layout, emphasizing a clean design that adapts to desktops, tablets, and smartphones. The architecture prioritizes modularity for future scalability And the Scratch is given below infigure :

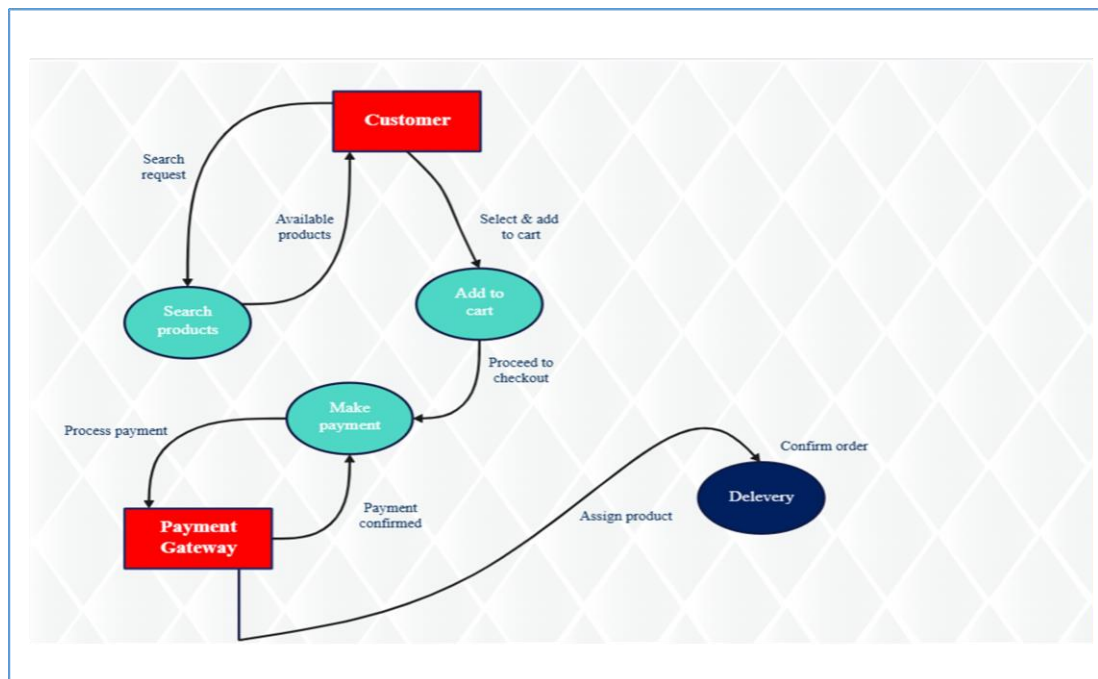


Figure 3.1.1: Data Flow Diagram

3.1.2 Functional Requirements

1. User Registration and Login

People can safely register for accounts on the site and log in to access customized features. To strengthen account security and the authentication procedure, an email verification system is being planned.

2. Cart Management

Customers can easily change quantities, delete things as needed, and add products to their shopping cart. To provide durability between sessions, the cart data is kept in the local storage of the browser.

Address Form

The user's name, phone number, and location are among the crucial delivery details gathered by a structured address form. To make sure that all information is true and comprehensive, input validation is used.

Product Search and Categorization

With the use of the platform's search function, users can locate products by entering pertinent keywords. To further hone their search results, users can apply filters based on categories, price, or relevancy.

User Profile Management

Better account control and order tracking are made possible via a separate user profile section where students may check their previous orders, change their personal information, and reset their passwords.

Product Reviews (Planned)

In order to help future purchasers make well informed selections based on peer feedback, a review system is developed that will enable users to rate and evaluate things they have purchased.

3. Admin Controls

In order to ensure the seamless running of the platform, administrators will have access to a back-end interface that enables them to track orders and access production overseas user accounts.

Nonfunctional Requirements:

Responsive Design

A back-end interface will be available to administrators, enabling them to track orders and access production overseas user accounts, guaranteeing the seamless running of the platform.

Performance Optimization

The platform prioritizes quickloading times and enhanced front end performance to deliver a seamless and effective user experience. Writing effective JavaScript and CSS code and reducing external dependencies are two ways to do this.

Browser Compatibility

To ensure a consistent experience for all users, the system is tested and maintained to work consistently across all major web browsers, including Microsoft Edge, Mozilla Firefox, Google Chrome, and Safari.

Accessibility

With features like keyboard navigation support, suitable color contrast, and screen-reader compatibility implemented to accommodate people with impairments and encourage inclusive usage, accessibility is a top priority.

Client-Side Data Validation and Security

User-submitted data is checked on the client side to avoid inaccurate or incomplete submissions. Additionally, fundamental security measures are put in place to guard against frequent weaknesses and guarantee secure user interactions.

Scalability and Reliability

The platform is built to be dependable and scalable, able to accommodate future feature extension and user growth without sacrificing stability or performance.

3.1.3 Hardware and Software Specifications

This table (3.1.5.1) shows Hardware and Software Specifications:

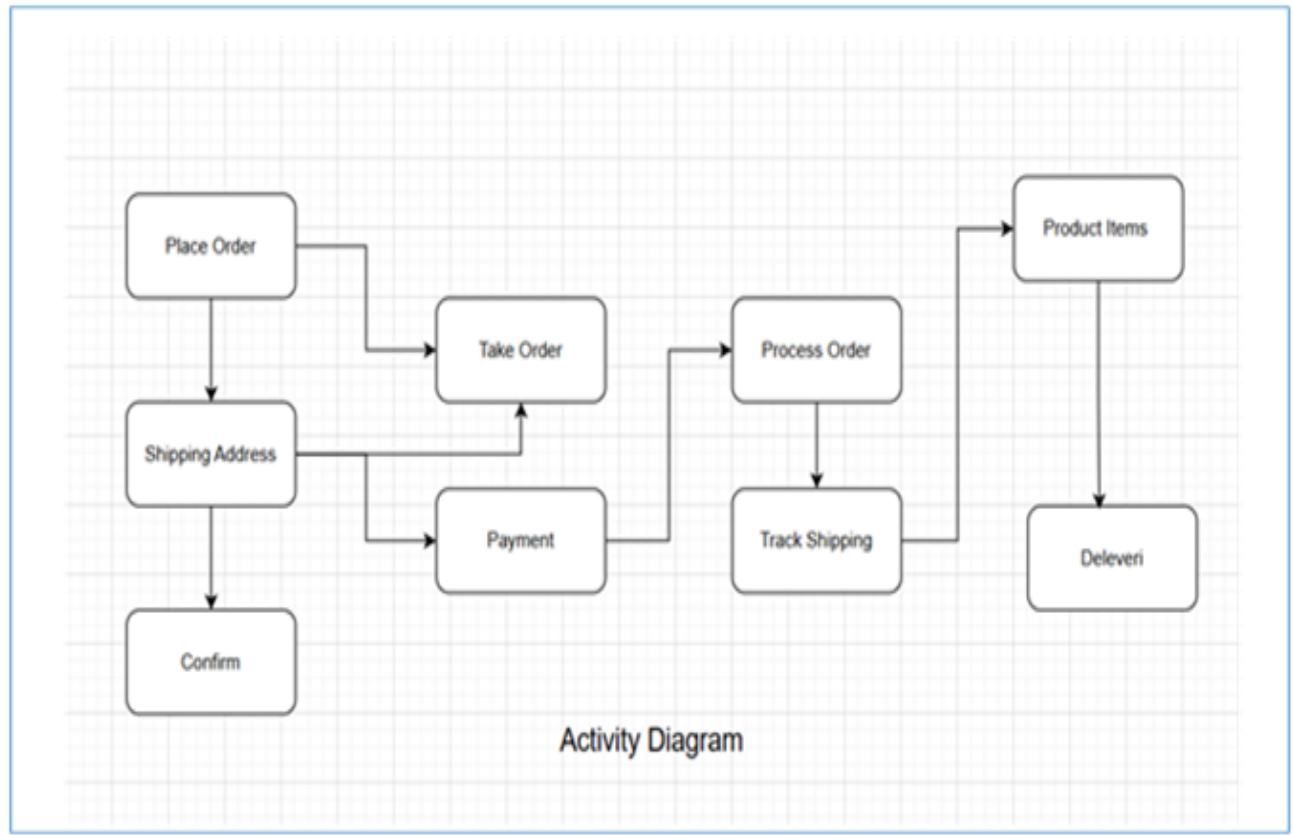


Figure 3.1.6.1: Activity Diagram

Table 3.1.5.1 Specifications

Category	Details
Processor	2.71 GHz or faster
RAM	16 GB
Disk Space	4 GB
Operating System	Windows 11, Linux, Mac
Frontend	HTML, CSS, JavaScript
Backend	Local Storage (future: phplaravel)
Code Editor	Visual Studio Code
Web Browser	Google Chrome
Drawing Tools	Draw.io

3.1.6 Use Case Diagram

The use case diagram for the **KutirShilpo** e-commerce project shows how customers and administrators interact with the system. Customers can register or log in, browse and search handicraft products, add items to their cart, provide delivery details, complete purchases, and track their orders. On the other hand, administrators manage the platform by adding, updating, or removing products, organizing categories, managing user accounts, processing orders, and viewing sales or customer reports. This diagram clearly defines the main system functionalities and provides a structured guide for the development of Kutir Shilpo. This diagram helps define system functionality clearly and guides development. This Fig 3.1.6.1 shows the use case diagram of KutirShilpo System:

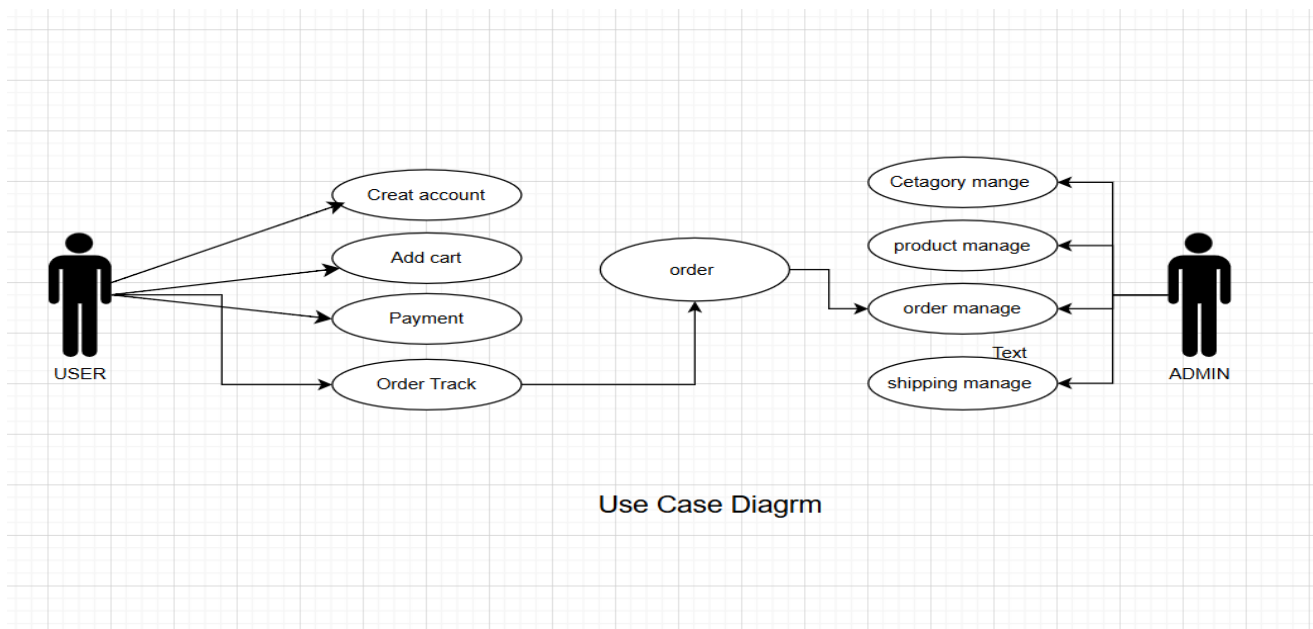


Figure3.1.7.1: Use Case Diagram

3.1.7 Activity Diagram

The *KutirShilpo* e-commerce system illustrates the sequence of actions performed by both customers and administrators. For a customer, the process starts with visiting the KutirShilpo website or app, then choosing to sign up or log in. After successful login, the customer can explore different handicraft categories, search for specific items, and add desired products to the shopping cart. From there, the user proceeds to checkout, enters delivery information, selects a payment option, and finally places the order. The system then confirms the purchase and allows the customer to track the order status. For administrators, the workflow includes logging in to the admin panel, adding or updating handicraft products, managing categories, monitoring customer orders, and generating reports. This diagram provides a clear picture of how different activities are connected, ensuring smooth operation of the KutirShilpo platform. This Fig 3.1.7.1 Shows the Activity Diagram Of KutirShilpo Order Process:

3.1.8 Sequence Diagram

The *KutirShilpo* e-commerce platform demonstrates how different components interact in a time-based order. The process begins when a customer accesses the website interface and logs in or registers. After authentication, the customer browses products through the product system and selects desired handicraft items. These items are then added to the cart system, which updates the shopping cart in real time. Once the customer proceeds to checkout, the order system handles delivery details, payment processing, and confirms the order. On the administrator's side, interactions include managing products in the product system and monitoring orders within the order system. This diagram highlights the step-by-step communication flow between users and system components, ensuring a clear understanding of Kutir Shilpo's operations. Fig: 3.1.8.1 Shows the Sequence Diagram of KutirShilpo

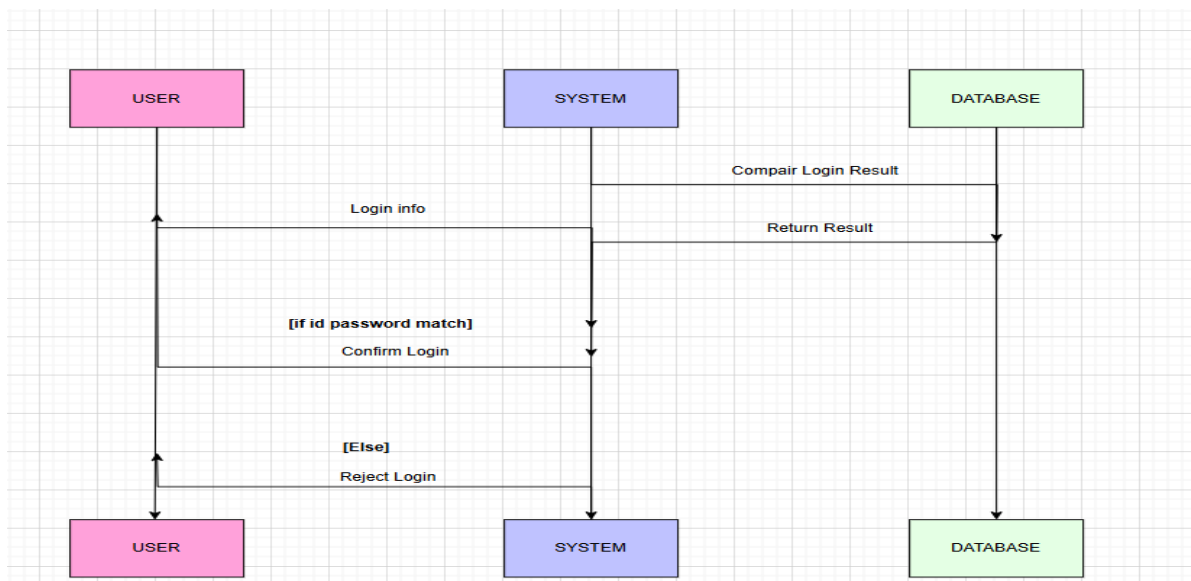


Figure 3.1.8.1 : Sequence Diagram

3.1.9 Class Diagram

The **class diagram** of the *KutirShilpo* e-commerce system illustrates the structure and relationships between its main components, such as **User**, **Product**, **Category**, **Cart**, **Order**, **Admin**, and **Review**. Each class includes attributes and methods that define its

responsibilities. The User class manages actions like registration, login, updating profiles, and placing orders. The Product and Category classes store details about handicraft items and their classifications, while the Cart class allows customers to add, remove, and update items. The Order class handles checkout, delivery details, and payment confirmation. The Admin class is responsible for managing products, categories, and user accounts. The Review class links customers to products, enabling them to provide feedback on purchased items. Relationships in the diagram show how users are connected to carts and orders, products are organized into categories, and reviews are tied to both users and products. This diagram provides a clear overview of the data structure and functionality within KutirShilpo. This Fig 3.1.10.1 Shows class diagram of code implementation

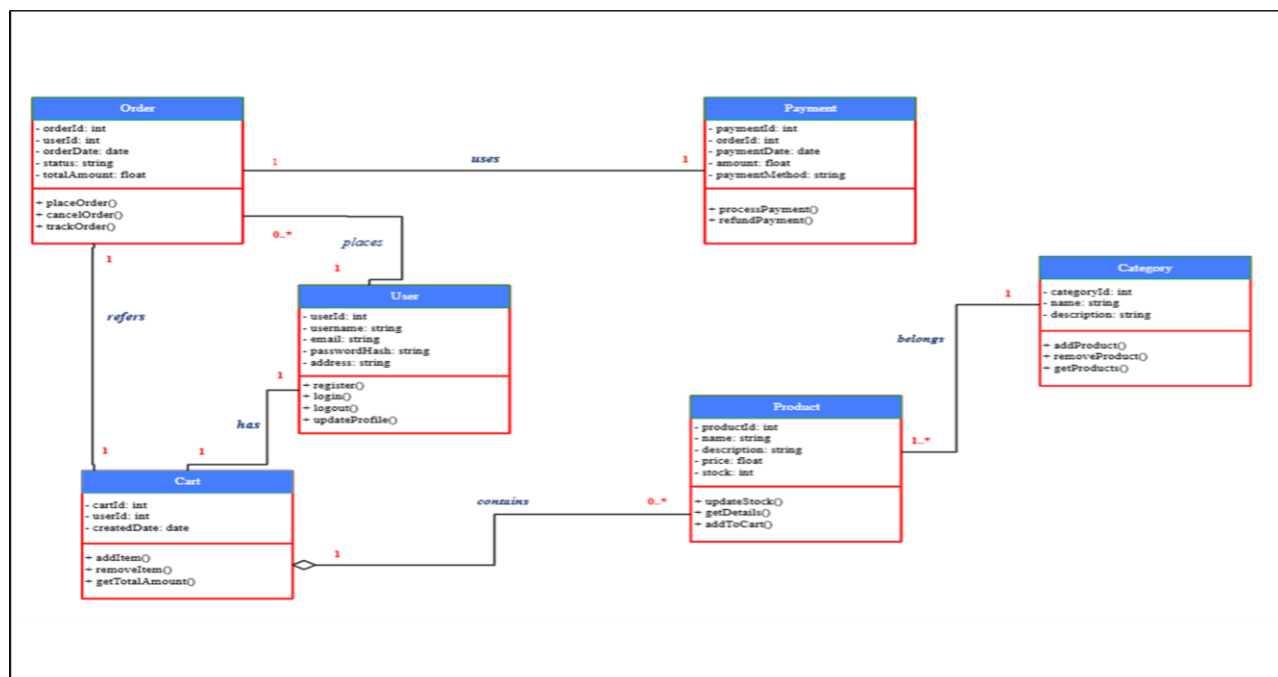


Figure3.1.10.1 : Class Diagram

3.1.10 ER Diagram

The **ER (Entity-Relationship) diagram** for the *KutirShilpo* e-commerce project shows the data structure and relationships among entities like **Users**, **Products**, **Categories**, **Cart**,

Orders, Reviews, and Admin. Key attributes include **UserID, ProductID, CategoryID,** and **OrderID.** Users are linked with carts and orders, products are organized under categories, and reviews connect users with products. Admins manage products, categories, and user accounts. This diagram provides a clear overview of how data is stored and related in KutirShilpo.

This Fig 3.1.10.1 Shows ER diagram of Kutir Shilpo.

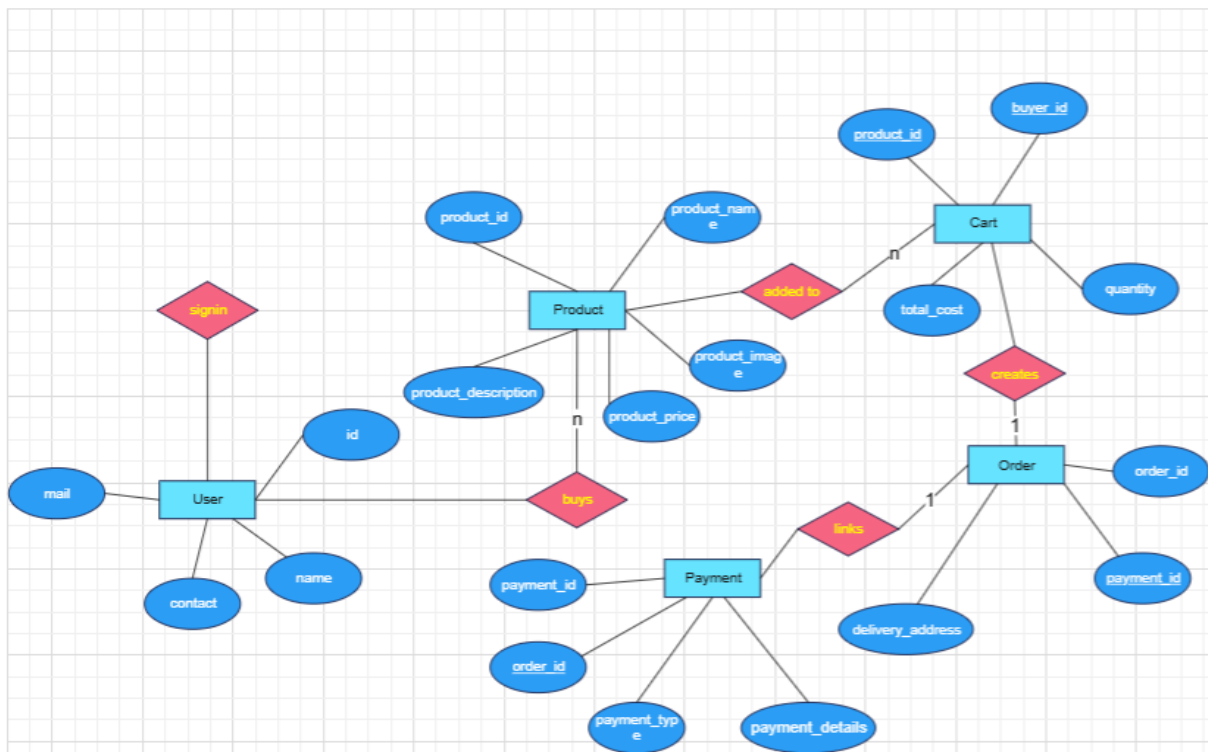


Figure3.1.10.1: ER Diagram

3.2 Detailed Methodology and Design

The detailed methodology and design of the *KutirShilpo* e-commerce system follow a structured approach to planning, development, and deployment. At the initial stage, requirement gathering was carried out to understand the needs of customers and artisans, focusing on showcasing authentic handicrafts, ensuring ease of use, and providing secure

transactions. In the design phase, wireframes, use case diagrams, activity diagrams, and ER models were created to visualize how users, products, carts, and orders interact within the platform. This structured methodology ensures that KutirShilpo delivers a smooth shopping experience while supporting efficient management of handicraft products.

3.3 Project Plan

This table 3.3.1 Shows the project plan of project.

Table 3.3.1: Project Plan

phase	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Write HTML												
Design CSS												
Java Script												
Design												
Testing & Debug												
Feedbac k												
Final Review												

3.4 Task Allocation

Project Manager: Oversees timelines, resources, and ensures smooth coordination with artisans and stakeholders.

UI/UX Designer: Creates user-friendly and visually appealing interfaces to highlight handicraft products and ensure easy navigation.

Front-End Developer: Builds product pages, shopping cart, and responsive layouts using HTML, CSS, and JavaScript.

Back-End Developer: Manages user authentication, product databases, order processing, and server-side logic.

Full Stack Developer: Connects front-end with back-end, integrates payment gateways, and ensures overall system flow.

QA Tester: Performs testing for usability, performance, security, and order management features.

Documentation Writer: Prepares user manuals, technical documentation, and guides for both developers and customers.

Marketing Team: Promotes the KutirShilpo platform through SEO, social media campaigns, and digital marketing to boost visibility and sales.

Chapter 4

Implementation and Results

4.1 Environment Setup

The environment setup for the *KutirShilpo* project is a crucial step to ensure a smooth and efficient development process. At the initial stage, a suitable text editor or integrated development environment (IDE) is selected. Commonly recommended tools include Visual Studio Code (VS Code), Sublime Text, or Atom, as they provide developer-friendly features. To further enhance productivity, relevant extensions such as Prettier for automated code formatting, Live Server for real-time browser reloading, and ESLint for JavaScript linting are integrated within the editor.

For testing and web browsing purposes, modern browsers such as **Google Chrome**, **Mozilla Firefox**, or **Microsoft Edge** are installed. Additionally, browser **Developer Tools (DevTools)** are employed for debugging and performance monitoring.

To manage project dependencies and initialize packages, **React.js** and **npm** (Node Package Manager) are configured. The project dependencies are systematically maintained within the **package.json** file. For advanced styling requirements, **Sass** may be employed, while modern CSS frameworks such as **Bootstrap** or **Tailwind CSS** are incorporated to ensure responsiveness and mobile-friendly design.

During the development phase, a local server is essential for project execution and testing. Tools such as **Live Server** in VS Code are used for front-end projects, while **XAMPP** is preferred in the case of PHP-based development. For database integration, systems like **MySQL** may be configured. User-friendly interfaces, including **phpMyAdmin**, are adopted to simplify database management.

In terms of quality assurance, testing frameworks such as **Jest** or **Mocha** are implemented for unit testing to validate the functionality of different modules. Additionally, **Postman** is employed for API testing and verification.

To ensure proper documentation, a README.md file is prepared, which outlines the project setup, file structure, and configuration instructions. Finally, the project files are organized into a systematic directory structure, which includes:

- **assets**: for images, fonts, and other resources
- **css**: for cascading style sheets
- **js**: for JavaScript files
- **html**: for markup files
- **img**: for image files

This structured environment setup not only streamlines development but also ensures scalability, maintainability, and collaborative efficiency throughout the lifecycle of the *KutirShilpo* project.

4.2 Testing and Evaluation performance

Table 4.2.1 Shows how website handle load & response time

Table 4.2.1: performance testing

Test Case ID	Description	Expected Result	Status
TC_PF01	Load home page	Loads in under 2 seconds	pass
TC_PF02	Cart-item add/update/remove	Action completes in under .5 second	pass
TC_PF03	Submit address form	Response in under 1.5 seconds	pass
TC_PF04	Product search	Results shown in under 2.5 seconds	pass

TC_PF05	80 concurrent users	No crash; response < 5 seconds	pass
TC_PF06	200 add-to-cart actions	System handles load without major delay	pass
TC_PF07	Load on slow mobile network	Key pages load in < 5 seconds; usable layout	pass
TC_PF08	Monitor CPU/RAM usage	Usage stays within 60%	pass
TC_PF09	Load 100+ products	Smooth listing and filtering	pass

4.3 Results and Discussion

The Student Park platform successfully meets its objectives, offering a fast, secure, and user-friendly e-commerce solution for university students. Performance testing confirmed optimized load times, even under high traffic, while comparative analysis highlighted its tailored approach to student needs. Unit, integration, and user acceptance testing validated core features, and security tests ensured data protection. The platform is ready to deliver a reliable and efficient shopping experience, with future plans for further enhancements like payment gateway integration and back-end connectivity.

4.3.1 Home Page

a picture from my website, KutirShilpo . Every element is clearly visible. The main gathering place for users is Kutir Shilpo's Home page. It has a search bar, product categories, new products and featured discounts in a responsive, simple interface. Figure in the next page :

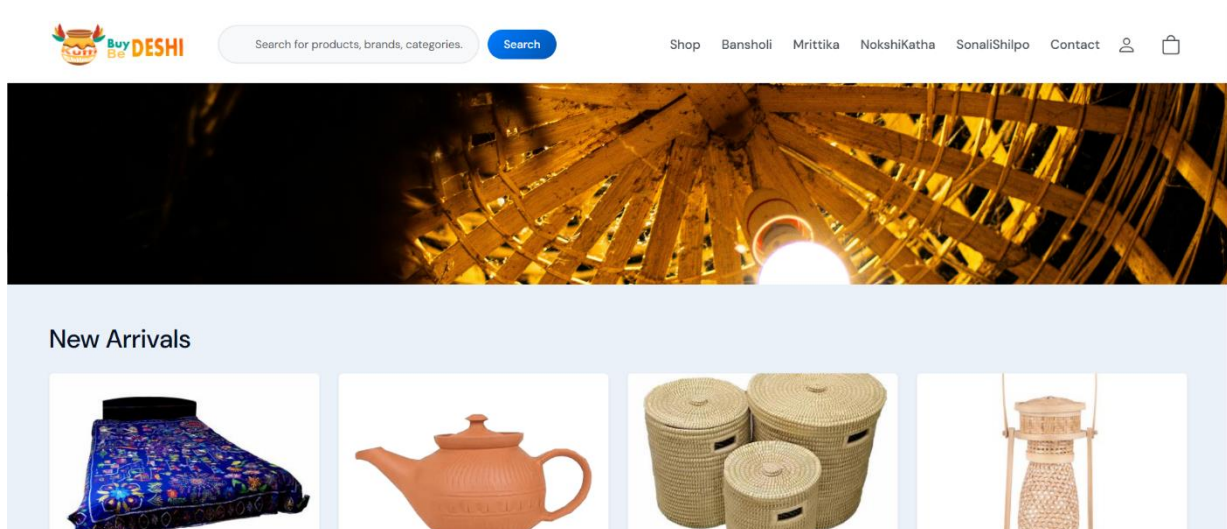


Figure4.3.2.1: Home page

4.3.2 Sign Up Page

This is an example of my website's sign-up page. KutirShilpo platform's Sign-Up page is made to give new users an easy-to-use and intuitive experience. Input fields for necessary data, including complete name, email address, password, and password confirmation, are included. Users can quickly explore and finish the registration process because to the clear and simple structure.

User Registration

Name

Email

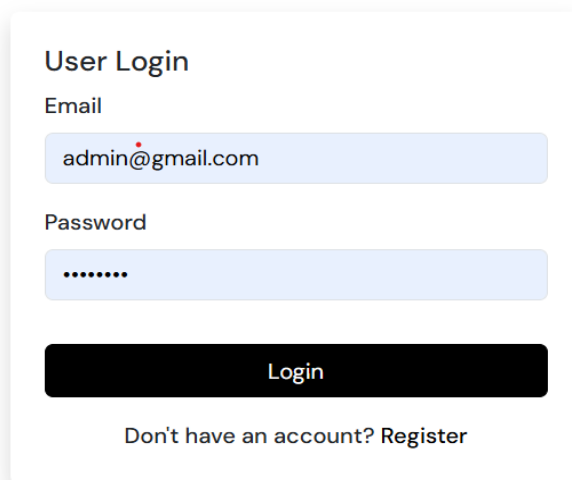
Password

Already have an account? [Login](#)

Figure4.3.2.1: Register page

4.3.3 Log In page

Registered users can safely access their accounts on the KutirShilpo platform's Login page. It has password and email fields as well as simple validation to guarantee that the credentials are correct. A quick and easy login process is ensured by the clear and customer-friendly design. Additionally, there is a "Forgot Password?" link for account recovery.



The image shows a 'User Login' form. It has a title 'User Login' at the top. Below it is an 'Email' label followed by a text input field containing 'admin@gmail.com'. There is a small red asterisk above the email field, indicating a validation error. Below the email field is a 'Password' label followed by a password input field with seven dots. At the bottom of the form is a black 'Login' button. Below the button is a link that says 'Don't have an account? Register'.

Figure4.3.3.1 : Login Page

4.3.4 Add ToCart

This is my website's add to cart page. On the Cart page, users can see, edit, or delete things from their cart. For Customer , this feature guarantees a smooth and well-organized buying experience. An "Add to Cart" button on every product card saves item details in the local cart system.

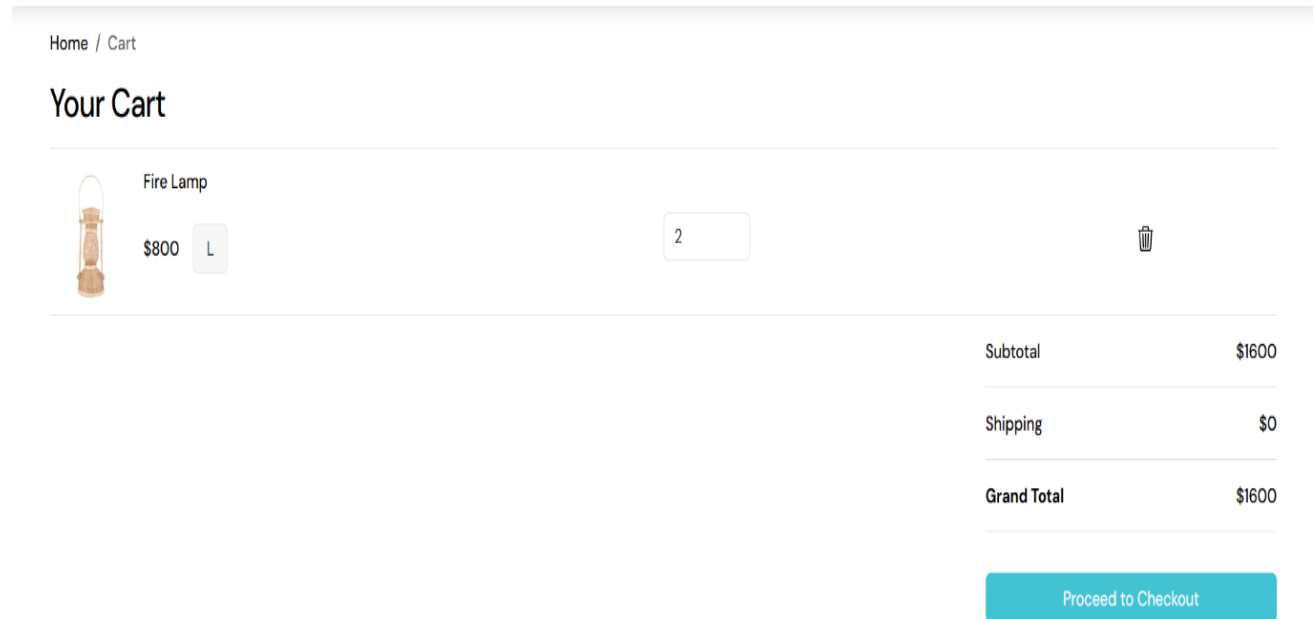


Figure4.3.4.1: Cart Page

4.3.5 All Items

The Student Park All Items page lists every product that is available in one location. Each item is displayed along with its name, price, image, and "Add to Cart" button. Customers can search for particular products by category, price, or relevancy, or they can browse through the products using filters. This page's organized, user-friendly style makes it simple for students to browse all of the available shopping alternatives.

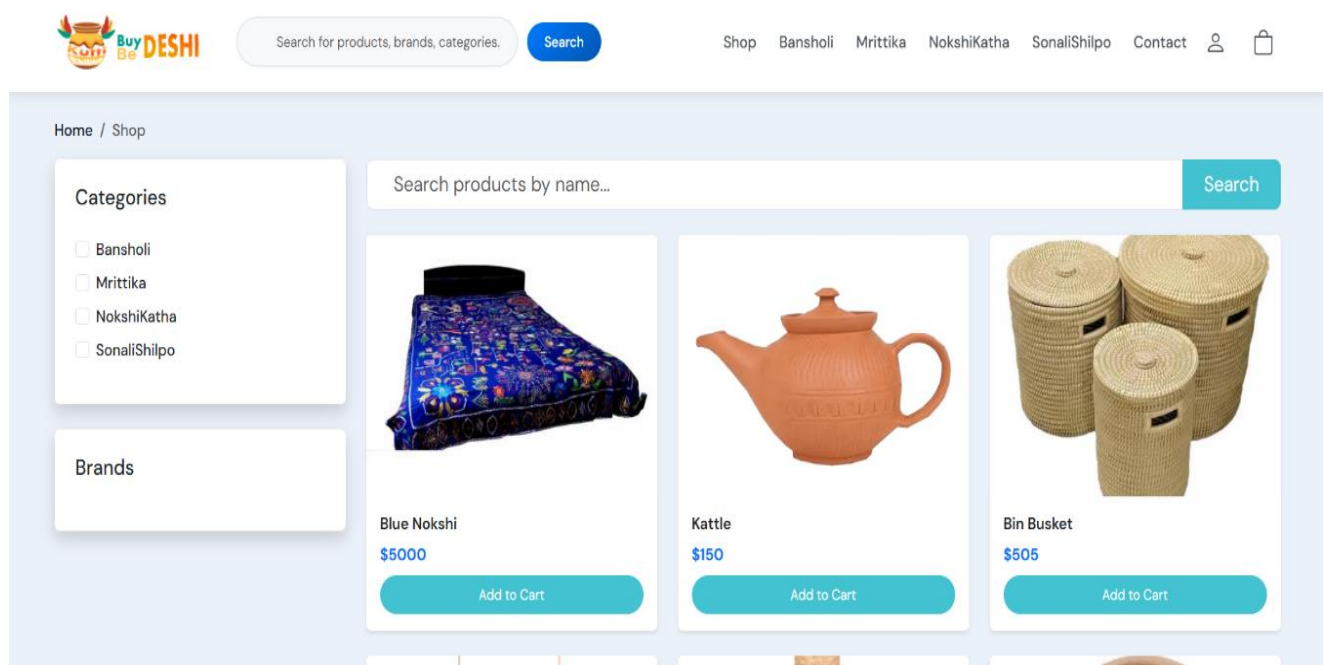


Figure4.3.5.1: All Items Page

4.4 Summary

The *KutirShilpo* platform is an e-commerce solution designed to promote Bangladeshi handicrafts while offering customers a simple and responsive online shopping experience. Built with HTML, CSS, and JavaScript, it supports key features such as product browsing, category-based filtering, cart management, user registration, and login.

In addition to providing customers with easy access to authentic handicrafts, the platform creates a digital marketplace for local artisans and entrepreneurs, increasing their visibility

and income opportunities. With its responsive design and scalable structure, *KutirShilpo* ensures accessibility across devices and allows for future integration of advanced features like delivery systems and secure payment gateways.

Easier for college students by emphasizing an accessible and responsive design. A seamless and reasonably priced purchasing experience is offered by Student Park, an online e-commerce site designed especially for college students. It makes it simple for consumers to sign up, log in, browse every product that is offered, filter by price or category, and easily manage a shopping cart.

Constructed using HTML, CSS, and JavaScript, the platform incorporates features like address input for future delivery integration and guarantees responsive design on all devices. Student Park gives local entrepreneurs the chance to address a specific audience while also assisting students in obtaining necessary lifestyle and academic supplies. To address the particular requirements of the student body, the project integrates essential e-commerce features with user-centered design. Additionally, it has an easy-to-use interface for perusing and classifying items based on price or relevancy. Student Park seeks to improve the entire shopping experience with its simple, user-friendly design. Additionally, Student Park wants to give nearby businesses a way to connect with students, boosting their exposure and revenue. The project is made to be scalable and to enhance user experience.

Chapter 5

Engineering Standards and Design Challenges

5.1 Compliance with the Standards

By following key standards, the KUTIR SHILPO platform ensures it meets best practices for security, accessibility, and web development. It uses modern tools like HTML5, CSS3, and JavaScript for the front-end, making it work well on different browsers and devices. Responsive design helps it look good on phones, tablets, and computers. For security, it includes safe login methods and protects user data with encryption. It also follows accessibility rules to make sure everyone, including people with disabilities, can use it easily, with features like keyboard navigation and screen reader support.

The platform follows WCAG (Web Content Accessibility Guidelines) to help users with disabilities, using clear labels, good color contrast, and ARIA roles for forms and buttons. For data protection, it uses secure coding to comply with Bangladesh's Draft Data Protection Act and Cyber Security Act 2023, along with international rules like GDPR where possible. Passwords are stored safely using hashing, and user privacy is protected. The code is updated regularly to stay in line with the latest standards, giving all users a secure, easy, and fair experience

5.1.1 Software Standards

The KUTIR SHILPO platform's software standards focus on ensuring secure, maintainable, and high-quality code throughout development. It uses HTML5, CSS3, and JavaScript for a simple and effective front-end, following web development best practices. The code follows clear naming rules, modular design, and proper spacing to improve readability and upkeep. Version control helps manage teamwork and track changes smoothly.

Carefully selected third-party tools and frameworks, based on performance, security, and support from the community, ensure compatibility and safety. This commitment to software standards creates a stable, scalable, and reliable platform.

5.1.2 Hardware Standards

The goal of the KUTIR SHILPO platform's hardware standards is to ensure the system runs smoothly on various hardware setups and devices. It is designed to be responsive and optimized for both high-end and low-end devices, allowing all users, including those with basic hardware, to access the platform easily. The server setup is chosen for performance, scalability, and reliability, with cloud hosting providing the resources needed to handle changing traffic levels. Techniques like caching and image optimization are used to boost performance, especially on mobile devices with limited processing power. Additionally, the system is built to support many users at once, ensuring steady performance across different hardware setups.

5.1.3 Communication Standards

The KUTIR SHILPO platform's communication standards ensure smooth, secure, and efficient interaction between the front-end, back-end, and third-party services. It uses widely accepted communication protocols, such as RESTful API architecture for connecting with back-end services and HTTP/HTTPS for secure data transfer. JSON is selected as the data exchange format due to its lightweight nature and easy integration. All sensitive exchanges, like payment details and user authentication, are transmitted over SSL/TLS-encrypted channels to ensure safety and privacy. The platform also includes logging systems and clear, consistent error messages to aid debugging and maintain reliable communication between system components.

5.3 Impact on Society, Environment and Sustainability

The KUTIR SHILPO platform highlights its commitment to sustainable practices and its positive impact on the craft community. The site allows artisans to sell essential Bangladeshi handicrafts, like bamboo and jute products, at affordable prices, reducing the financial strain often linked to traditional markets. This supports artisan livelihoods and preserves cultural

heritage. By promoting online sales and reducing the need for physical shops and transportation, the platform fosters eco-friendly habits and cuts carbon emissions tied to conventional retail. Sustainable packaging policies are planned for future delivery services to further support green goals.

By empowering local artisans, KUTIR SHILPO aims to build a sustainable, scalable business model. This provides small craft businesses access to a wider market, boosts economic growth, and reduces reliance on global supply chains, strengthening local economies. The platform's use of cloud hosting solutions also lowers energy use by minimizing the need for physical infrastructure.

5.2.1 Impact on Life

The KUTIR SHILPO platform enhances the daily experiences of artisans and craft enthusiasts by making Bangladeshi handicrafts, like nokshi katha and jute products, easily accessible. It helps them manage their time, resources, and cultural needs by offering affordable handmade items online. With its user-friendly design, the platform simplifies purchasing, removing the need to visit physical markets or navigate complex sites. Beyond instant convenience, KUTIR SHILPO improves the overall experience by promoting well-being through stress-free shopping. It enables artisans to focus on their craft and enthusiasts to engage with culture, providing tailored products suited to their unique demands. Additionally, the platform fosters a sense of community by supporting local artisans, offering access to exclusive cultural items.

5.2.2 Impact on Society & Environment

The KUTIR SHILPO platform highlights its broader benefits to society and the environment. By offering affordable, culturally significant handicrafts, it promotes inclusivity by providing diverse artisans and enthusiasts access to tools that preserve Bangladeshi heritage and support livelihoods. By creating a digital marketplace, it empowers local craft producers, strengthens small businesses, and creates job opportunities. KUTIR SHILPO enhances environmental sustainability by reducing the need for traditional retail spaces and their associated waste and energy use. The platform lowers the carbon footprint from physical

shops and product transport by encouraging online sales. Additionally, it may eventually adopt eco-friendly delivery methods like sustainable packaging.

5.2.3 Ethical Aspects

The KUTIR SHILPO platform's ethical aspects focus on ensuring ethical business practices prioritize users' rights, fairness, and social responsibility. By guaranteeing that all user data is handled with the utmost confidentiality and security while complying with data protection laws like Bangladesh's Draft Data Protection Act, the platform upholds ethical standards. KUTIR SHILPO ensures users that their financial and personal data is protected from misuse or unauthorized access through transparent privacy policies and secure payment systems. By supporting local artisans, the platform promotes fair trade by offering them a fair chance to reach a broader audience without exploitation. Additionally, the site follows ethical marketing guidelines by providing honest and clear product descriptions, avoiding false claims, and ensuring craft enthusiasts benefit. Accessibility is also addressed, aiming to offer an inclusive platform for all users, including those with disabilities. The design adheres to accessibility standards, allowing easy navigation and purchasing regardless of cognitive or physical abilities. This ethical commitment fosters a fair, user-centered, and socially aware e-commerce experience.

5.2.4 Sustainability Plan

The KUTIR SHILPO platform's sustainability plan seeks to ensure long-term growth while minimizing environmental impact and promoting socially conscious practices. By using cloud-based hosting, which consumes less energy than traditional physical servers, the platform aims to reduce its carbon footprint. It decreases transportation emissions typically associated with retail by encouraging digital sales and reducing the need for physical market visits. For product sustainability, KUTIR SHILPO will promote ethically sourced or eco-friendly handicrafts and encourage artisans to adopt sustainable packaging. The platform's inclusion of features allowing users to filter for eco-friendly or sustainable items will make ethical buying easier for enthusiasts.

KUTIR SHILPO will regularly evaluate its operations and business practices to identify

improvement areas, such as reducing waste, enhancing energy efficiency, or collaborating with more ethical and local artisans, to maintain sustainability over time. The long-term goal is to foster a business model that balances economic growth, environmental care, and social responsibility for years to come.

5.3 Project Management and Financial Analysis

The KUTIR SHILPO platform's project management and financial analysis involve a structured approach to overseeing the platform's creation, implementation, and ongoing operations, ensuring the project meets its goals within the set time and budget. The project lifecycle, encompassing planning, design, development, testing, deployment, and maintenance, is well-defined. The financial analysis focuses on resource allocation, ensuring all costs align with the project's objectives. The platform is projected to cost 50,000 Taka in total, with the following breakdown:

Table 5.3.1 Financial Analysis

Category	Description	Cost (Taka)
Local Host	0	0,000
Development Tools & Licenses	Code editors, UI kits, libraries	8,000
Design & Graphics	Logo, banners, product images, icons	7,000
Marketing & Promotions	Social media ads, email marketing tools	20,000
Testing & Debugging Tools	Cross-browser testing platforms	5,000
Content Writing & Docs	Manuals and SEO content	5,000
Contingency Reserve	Unexpected expenses or upgrades	5,000
Total		50,000

Ad placements, affiliate marketing, and partnerships with local artisans are examples of potential revenue streams that support the platform's long-term viability. The financial plan prioritizes user satisfaction and platform growth while balancing initial costs with sustainable profits. The project management approach ensures timely delivery within budget, minimizes risks, and optimizes resource use effectively.

5.4 Complex Engineering Problem

Prior to developing my website, I conducted research on the needs of customer and planned features that prioritized price, usability, and support . Using HTML, CSS, and JavaScript, I created the layout and user interface to make sure it was accessible and responsive. The system layout was led by a Data Flow Diagram (DFD), which highlighted important procedures including ordering, browsing, and registration. I built and improved the website

using design resources, testing platforms, and development tools. In the end, I implemented a scalable hosting strategy and was ready for further enhancements like payment integration and user authentication.

5.4.1 Complex Problem Solving

Table 5.4.1.1: Mapping with complex problem solving.

EP1 Dept of Knowledge	EP2 Range Of Conflicting Requirements	EP3 Depth of Analysis	EP4 Familiarity of Issues	EP5 Extent of Applicable Codes	EP6 Extent Of Stakeholder Involvement	EP7 Interdependence
✓	✓		✓			

Mapping with Knowledge Profile for EP1

This table [5.2](#) is designed to map the EP1 to the Knowledge Profile.

Table 5.4.1.2: Mapping with knowledge Profile.

K3 Engineering Fundamentals	K4 Specialist Knowledge	K5 Engineering Design	K6 Engineering Practice	K8 Research Literature
✓	✓	✓		

5.4.2 Justification for EP Attributes Mapping

EP1: Depth of Knowledge required:

You demonstrated solid engineering knowledge by using HTML, CSS, and JavaScript to build a fully functional e-commerce platform tailored to students. Your understanding of responsive web design, front-end logic, and UI/UX principles shows a competent application of technical fundamentals. The integration of features like category-based filtering, cart management, and address input reflects a depth of understanding in web development and user interaction.

EP2: Range of Conflicting Requirements required:

Your project addressed multiple and sometimes conflicting requirements, such as:

- **Affordability** (keeping the platform lightweight and cost-effective),
- **Usability** (making it easy for customer to navigate),
- **Accessibility** (ensuring the design is responsive and inclusive),
- **Support for local vendors** (prioritizing regional needs over generic solutions).

Balancing these priorities required careful consideration of trade-offs in design, performance, and user needs—demonstrating your ability to handle complex and competing engineering requirements.

EP4: Familiarity of Issues required:

While I was working on the e-commerce project, I encountered many common e-commerce challenges, but I applied them in a new context—catering to university students with limited budgets and specific academic needs. This required me to tailor standard features like shopping carts, product filtering, and address input forms to better serve the student demographic. By understanding and addressing these unique user needs, I was able to approach familiar issues with a fresh perspective and create a more relevant solution for this

particular user group.

5.4.3 Justification for Knowledge Profile mapping

(Linked to EP1)

K3: Engineering Fundamentals

I used HTML, CSS, and JavaScript—three essential web development technologies—to apply basic engineering principles in my project. These technologies serve as the cornerstone of web design and development, enabling me to build an e-commerce platform that is both practical and easy to use. I was able to create a responsive and accessible website because to my grasp of fundamental web structure, design, and front-end interactivity. In order to guarantee a seamless user experience for students, I also made sure the website followed accepted UI/UX design standards.

K4: Specialist Knowledge

I customized the platform for college students by applying my specialized knowledge of front-end development and UI/UX design. I used sophisticated responsive web design ideas and interactive JavaScript components, like dynamic product displays, category-based filtering, and cart management. With this specific knowledge, I was able to develop an effective and captivating system that not only satisfies technical specifications but also guarantees a consistent user experience across multiple devices.

K5: Engineering Design:

Developed a useful and user-focused e-commerce platform using engineering design concepts. I concentrated on user requirements including accessibility, cost, and ease of use. I made sure the platform was user-friendly and efficient by creating features like address input, shopping cart management, and product categories. In order to create a user-friendly, safe, and responsive website that meets the specific needs of each student, I used problem-solving strategies when building these elements.

5.4.4 Engineering Activities

EA1 Range of re- sources	EA2 Level-of Interaction	EA3 Innovation	EA4 Consequences for society and environment	EA5 Familiarity
✓	✓	✓		

Table 5.3: Mapping with complex engineering activities.

5.4.4.1 Justification for Engineering Activities mapping

EA1: Range of Resources

In my project, I worked with a diverse range of resources. For development, I used tools like Visual Studio Code, along with HTML, CSS, and JavaScript libraries to build the website. I also utilized UI kits and design tools for visuals (logos, banners), and testing platforms to check cross-browser compatibility. Additionally, I relied on web hosting services with scalable bandwidth to simulate deployment. Managing these various resources helped me gain practical experience in using both software and infrastructure efficiently.

EA2: Level of Interaction

The project required me to manage and design interactions at multiple levels. On the technical side, I coordinated how different components of the website—such as the product display, shopping cart, and address input—communicated with each other. On the user side, I focused on building a seamless and intuitive interface so that users could easily navigate, filter items, and manage their cart. Even though the project was front-end focused, ensuring a smooth flow of interaction between modules and users was essential to its success.

EA3: Innovation

Introduced innovation by adapting a standard e-commerce model to meet the unique needs of university students. Most platforms don't cater specifically to students, but I focused on affordability, local vendor support, and a simple, mobile-friendly interface. This required me to rethink the typical structure of online shopping and design a system that fits the budget-conscious lifestyle of students. The custom category filtering and student-centered product presentation were key areas where I applied innovative thinking.

5.5 Summary

The creation of the KUTIR SHILPO platform involved various engineering activities, including system design, deployment, and maintenance. The process begins with designing the architecture and selecting technologies for the front-end and back-end components. Efficient data retrieval and storage are ensured through a well-planned database design. Front-end engineers focus on building a responsive and user-friendly interface, while back-end engineers manage server-side processes, security, and database connections. Encryption and secure authentication methods are implemented to protect user data and transactions effectively. Authentication are two examples of security techniques that are used throughout the development process. After thorough testing to make sure the platform satisfies functional and performance requirements, performance optimization is carried out to improve user experience and load times. Following implementation, the platform is kept safe, scalable, and user-focused through ongoing monitoring, maintenance, and user input.

Chapter 6

Conclusion

6.1 Summary

The "KUTIR SHILPO" initiative is an online store designed to meet the specific needs of Bangladeshi handicraft enthusiasts, offering a wide range of affordable cultural products like bamboo crafts, nokshi katha, mud crafts, and jute items. Developed with HTML, CSS, and JavaScript, the platform aims to provide an intuitive, user-friendly experience with key features such as secure user registration, cart management, address entry, and product search with filtering options. Additionally, it incorporates performance optimization, ensures device compatibility, and adheres to security and accessibility standards. The project seeks to empower local artisans to reach a broader market while offering enthusiasts a convenient and affordable shopping option. Future enhancements include back-end connectivity, payment gateways, user authentication, and delivery tracking. Ultimately, the initiative addresses the gap in e-commerce for cultural handicrafts.

6.2 Limitation

Despite offering a tailored e-commerce solution for handicraft enthusiasts, the "KUTIR SHILPO" platform faces several limitations. First, it currently features only front-end functionalities, lacking back-end integration for real-time product management, which could hinder scalability as the user base grows. Additionally, the platform does not support online payment gateways, requiring transactions to depend on external systems. While security measures exist, they are limited to front-end validations, necessitating further efforts to enhance back-end data protection. Although responsive, the user interface may require additional adjustments to meet diverse user needs and device types. Moreover, the overall user experience is constrained by the absence of advanced features like delivery tracking and customer reviews. Finally, as a platform focused on cultural handicrafts, its potential market might be restricted, possibly limiting appeal to a broader audience.

6.3 Future Work

- Integrate a backend system with a database like MongoDB or MySQL to enable dynamic product management, real-time inventory updates, and secure data storage.
- Implement payment gateways such as bKash, Nogod, Upai, Rocket or SSLCommerz to facilitate seamless online transactions and enhance the platform's utility.
- Introduce a delivery tracking system to provide users with real-time order updates.
- Prioritize stronger encryption and data security measures to ensure a secure, fast, and scalable platform.
- Explore mobile app development to expand the platform's accessibility and reach.

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