

Assignment # 3

User-Centered Design Process Evaluation Human Computer Interaction (CS261)

Submitted by:

	Member 1	Member 2	Member 3	Member 4
Name	Maheen Akhtar Khan	Aimen Munawar	Hadia Ali	Aima Sibtain
CMS	429419	415867	410865	411885
Section	BESE-13-A	BESE-13-A	BESE-13-A	BESE-13A

Student Marketplace for Academic & Research Projects - Project X: Problem Statement

1. Context:

Every semester, several students from universities like NUST invest their time and university resources in completing their capstones, course assignments, design projects, and even mini-research studies. However, once graded, most of this work goes into personal drives or maybe into some departmental repository, never to be again referred to or iterated. Meanwhile, the new cohort suffers by looking for good references, not to mention the budding entrepreneurs who could launch their ideas yet have nowhere to showcase them. Currently available options-freelance sites (like Upwork) and general e-commerce platforms-are actually not suited to the academic model: they do not have stringent project categorization, peer-review cues, domain-specific search filters, or supportive learning artifacts: documentation, reports, source codes. Thus, a useful segment of the knowledge capital remains stuck while students are denied the possibility of earning income and professional visibility. Main Problem There is no single, trusted market for the exchange, discovery, and reuse of student-built academic and technical projects. This manifests itself in four related pain points:

- 1. **Student Output Invisibility** Completed projects are all "lost" after submission, leaving the academic community bereft of reusable codebases, data, and design blueprints.
- 2. **Inefficient Knowledge Transfer** Students who search tested references spend too much time sorting through disparate blogs, GitHub snippets, and poorly indexed institutional archives
- 3. **Monetization & Motivation Gap** Without an opportunity to sell or license their work, students have little financial motivation to go beyond grading rubrics in their project development; potential sources of revenue remain untapped.
- 4. **Quality & Credibility Concerns** Where ad-hoc sharing does take place, there is little transparency around the project scope, completeness of documentation, or technology stack, making it risky for buyers to invest effort or money.

Scope of the Problem:

The problem focuses on digital academic artifacts such as software, research reports, hardware drawings, and datasets and does not concern the modality of physical shipment or plagiarism detection grids or generic freelance services brokering. Stakeholders include students-both sellers and buyers-academic mentors, innovation hubs, and potential recruiters.

Opportunity Statement:

If Project X could secure and deliver such a marketplace, based on student-centric architecture and rich capabilities for categorization, searching, and transacting, then:

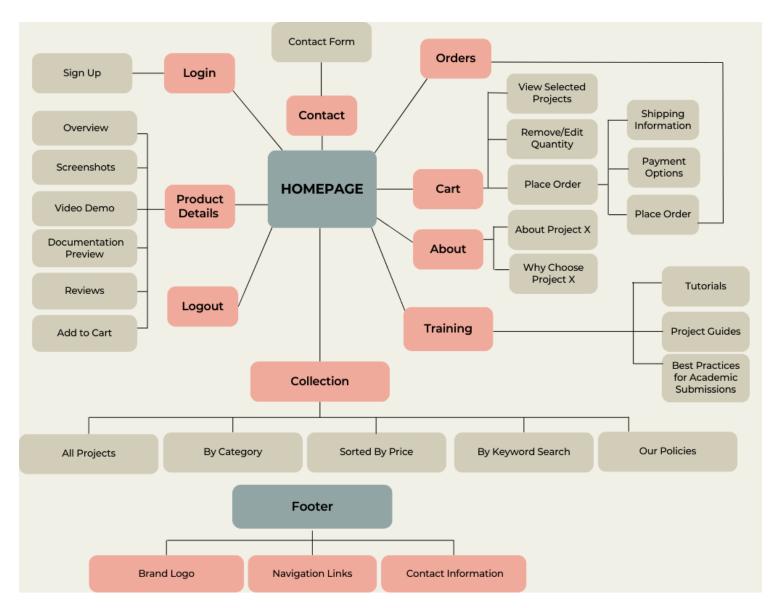
- 1. Work long dormant in academia could find application in solving real-world problems
- 2. Learners would access credible referents more swiftly
- 3. Students would derive income from their efforts while at the same time building public

- portfolios
- 4. The universities would benefit from increasing visibility and impact of student innovation.

Primary Stakeholders:

- 1. Student Sellers
- 2. Buyers
- 3. Project Team Members (Developers, Designers, QA

Navigation Map of Our Project:



User-Centered Design Evaluation of Project X

Introduction

This document presents the results of the user-centered design evaluation conducted for Project X, an e-commerce web application. The evaluation phase identified both strengths and areas for improvement through user feedback. Our platform aims to provide a seamless shopping experience for student sellers to manage their products and for buyers to easily purchase items.

Evaluation Methodology

Evaluation Objectives

- Assess the usability and intuitiveness of Project X's user interface
- Identify potential navigation issues in the user journey
- Evaluate the effectiveness of the visual design and color scheme
- Gather feedback on key functionalities (shopping cart, checkout process, seller panel)
- Test the responsiveness and adaptability across different device sizes
- Evaluate the effectiveness of error handling and user guidance

Participant Selection

We recruited 5 participants representing our key user groups:

- 2 Student Sellers (students who sell products and manage inventory through the seller panel)
- 2 Student Buyers (students who want to purchase products)
- 1 Non-Student Buyer (general public user)

All participants were familiar with e-commerce platforms but had never used Project X before, providing fresh perspectives on our interface design.

Evaluation Techniques

Usability Testing

We conducted short usability testing sessions where participants completed specific tasks while thinking aloud:

- 1. Navigate from home page to collection page
- 2. Find a specific product in the collection
- 3. Add products to cart and modify quantities
- 4. Complete the checkout process
- 5. Create an account and log in
- 6. For sellers: Add and remove products through the seller panel

Each session lasted approximately 15 minutes and was recorded for analysis. Participants were encouraged to verbalize their thoughts, expectations, and confusion points throughout the process.

Heuristic Evaluation

We used a simplified version of Nielsen's Usability Heuristics focusing on:

- Visibility of system status
- User control and freedom
- Consistency and standards
- Aesthetic and minimalist design
- Error handling
- Recognition rather than recall

Post-Task Questionnaires

After completing the tasks, participants rated their experience on:

- Task difficulty (1-Very Difficult, 5-Very Easy)
- Visual appeal (1-Poor, 5-Excellent)
- Navigation intuition (1-Confusing, 5-Very Intuitive)
- Overall satisfaction (1-Very Dissatisfied, 5-Very Satisfied)
- Error recovery (1-Very Difficult, 5-Very Easy)
- Information clarity (1-Very Unclear, 5-Very Clear)

Evaluation Results

Usability Testing Findings

Navigation Issues

The navigation system received mixed feedback with identified issues and strengths:

- 3/5 participants found the main navigation structure intuitive with the navbar layout, but 2/5 suggested improvements to make the active page indication more prominent. One participant stated, "Sometimes I'm not sure which page I'm currently on."
- The hover effects on navigation items received positive feedback from 3/5 participants, but several noted they could be more pronounced. A participant mentioned, "The hover effect is subtle, maybe too subtle for users to notice the interaction."
- 2/5 participants noted difficulties with the mobile dropdown menu, stating it could be more visible and accessible. One participant commented, "On my phone, I had to tap a few times to get the menu to appear."
- 3/5 participants suggested adding transition animations between pages to create a more cohesive browsing experience. A participant noted, "Pages change abruptly when navigating, which feels jarring."

Cart Functionality

The cart implementation received generally positive feedback but with notable improvement opportunities:

- While all participants successfully added items to cart, 2/5 suggested adding a confirmation animation or message. One participant noted, "I wasn't completely sure if the item was added until I checked the cart icon."
- The cart icon received positive feedback, but 3/5 participants suggested adding a more prominent item counter. A participant stated, "The cart count is a bit small and easy to miss."
- 3/5 participants suggested implementing a persistent cart preview that appears when hovering over the cart icon. One mentioned, "I'd like to see what's in my cart without having to navigate to a different page."
- 2/5 participants found modifying product quantities in the cart somewhat cumbersome and suggested more intuitive controls. A participant commented, "The quantity adjustment could be clearer with plus and minus buttons instead of a dropdown."
- 3/5 participants noted that the empty cart state could be improved with better guidance on next steps. One stated, "When my cart was empty, I wasn't sure where to go next."

Visual Design

The color scheme and overall visual design received mixed feedback:

- 4/5 participants responded positively to the color scheme, though 2/5 noted contrast issues between text and backgrounds in some areas. One participant mentioned, "The text can be hard to read in some sections where the contrast isn't strong enough."
- The consistency of brand colors received positive feedback, but 3/5 participants noted inconsistencies in how colors are applied across different components. A participant commented, "Some buttons use different shades of the same color, which feels inconsistent."
- Typography choices received feedback from 3/5 participants who suggested improving hierarchy and sizing, particularly on mobile devices. One stated, "The font is sometimes too small on my phone, especially in the product descriptions."
- 3/5 participants noted issues with white space distribution, suggesting some areas feel cramped while others have too much empty space. A participant mentioned, "The product listing pages could use more consistent spacing between items."
- All participants provided feedback on product image presentation, with 2/5 suggesting improvements to image sizing and quality consistency. One noted, "Some product images appear stretched or of lower quality than others."
- 4/5 participants identified responsive layout issues between desktop and mobile views. A
 participant stated, "Some elements don't adapt well when I switch from desktop to
 mobile view."

Seller Panel Functionality

The seller panel received specific feedback from student seller participants:

- The sales information display received mixed feedback, with sellers suggesting more visual data representation. A seller commented, "I'd prefer to see charts or graphs of my sales rather than just numbers in a table."
- The product removal process was found to lack sufficient confirmation, with one seller stating, "I accidentally deleted a product because there was no confirmation dialog asking if I was sure."
- Sellers suggested adding a dashboard with key metrics as the landing page for the seller panel. A participant mentioned, "I want to see important information like recent sales immediately when I log in."

Form Feedback and Validation

The current form validation approach received detailed feedback:

- All participants encountered issues with form validation, with 4/5 noting a lack of real-time feedback when entering invalid data. One participant specifically mentioned, "I only found out my password was too weak after submitting the form."
- The error indication on invalid fields was criticized by 3/5 participants as being too subtle. A participant noted, "I didn't notice the red error text immediately because of the background color, it should be more obvious when something is wrong."
- 4/5 participants suggested adding more helpful error messages that appear below form fields when validation fails. One stated, "The error messages are generic and don't tell me exactly what's wrong or how to fix it."
- 3/5 participants recommended adding visual confirmation when fields contain valid input. A participant commented, "I'd like to know which fields I've completed correctly as I go."
- 3/5 participants suggested preventing form submission until all required fields are valid. A participant stated, "It's frustrating to click on the submit button and I get an error toast that certain fields are missing."
- 2/5 participants recommended adding password strength indicators to guide users. One mentioned, "I had no idea if my password was considered strong or weak."

Checkout Process

The current checkout flow received detailed feedback with improvement suggestions:

- All participants completed the checkout process but 3/5 noted it could be streamlined with fewer steps. One noted, "The checkout process feels longer than it needs to be."
- 4/5 participants suggested adding a step indicator to show progress through the checkout process. One stated, "I wasn't sure how many more steps I had to complete before finalizing my order."
- All participants recommended keeping the order summary visible throughout checkout. A
 participant mentioned, "I had to go back to check what I was ordering because the
 summary disappeared between steps."
- 3/5 participants suggested adding address form auto-completion to save time. One

- commented, "Entering my full address manually was time-consuming."
- 2/5 participants noted confusion between shipping and billing information sections and suggested clearer separation. A participant stated, "I wasn't sure if I needed to fill out both address sections or if they could be the same."
- 2/5 participants recommended adding an "Edit Cart" option during checkout for last-minute changes. One mentioned, "I wanted to add another item but had to cancel the checkout and start over."
- All participants suggested improving the order confirmation with more detailed information and sending immediate email receipts. A participant noted, "There was no order confirmation page"

Heuristic Evaluation Findings

1. Visibility of System Status

Issues:

- Active page indication in navigation is insufficient; 2/5 users couldn't easily identify current location
- Cart additions lack confirmation feedback; users uncertain if items were added successfully
- Small, easily missed cart counter fails to clearly communicate cart status
- Checkout process lacks progress indicators, creating uncertainty about completion steps
- Form validation provides delayed feedback rather than real-time status updates

Strengths:

- Hover effects on navigation items provide some interaction feedback
- Cart icon effectively communicates shopping functionality
- Brand color scheme maintains consistent visual language across the interface

2. User Control and Freedom

Issues:

- Mobile dropdown menu has accessibility issues, requiring multiple attempts to activate
- Modifying product quantities in cart is cumbersome with suboptimal controls
- Product removal in seller panel lacks confirmation dialog, leading to accidental deletions
- Checkout process is perceived as overly lengthy without ability to edit cart mid-process
- Form submission allowed before validation, forcing users to correct errors after submission

Strengths:

- Main navigation structure allows efficient movement between major sections
- Users can successfully add items to cart without difficulty
- Checkout process is completable despite opportunities for improvement

3. Consistency and Standards

Issues:

- Inconsistent application of brand colors across components
- Typography hierarchy and sizing inconsistencies, particularly on mobile
- Irregular white space distribution creates unbalanced layout
- Product image quality and sizing varies across listings
- Responsive layout inconsistencies between desktop and mobile views

Strengths:

- Overall color scheme implementation received positive feedback from most users
- Navigation bar layout follows standard patterns recognized by most users
- Cart icon placement and functionality aligns with e-commerce conventions

4. Aesthetic and Minimalist Design

Issues:

- Text-background contrast issues in certain areas affect readability
- Inconsistent spacing creates visual clutter in some sections while leaving others empty
- Form error indication is too subtle against background colors
- Mobile typography sometimes too small, particularly in product descriptions

Strengths:

- Color scheme generally well-received by most participants (4/5)
- Overall brand color consistency creates cohesive visual identity
- Clean cart icon design effectively communicates functionality

5. Error Prevention and Handling

Issues:

- Form validation appears only after submission rather than preventing errors
- Error messages are generic and unhelpful for problem-solving
- Error indication on invalid fields lacks sufficient visibility
- No password strength indicators to guide secure password creation
- Checkout form lacks address auto-completion to reduce manual entry errors

Strengths:

- Basic form validation exists, even if implementation needs improvement
- Error messages are present, though they could be more helpful and prominent

6. Recognition Rather Than Recall

Issues:

- Empty cart state lacks clear guidance on next steps
- Order summary disappears between checkout steps, forcing users to remember details
- Checkout process requires users to remember previous selections
- Shipping/billing information sections cause confusion about required information

Strengths:

- Main navigation structure is intuitive for most users (3/5)
- Cart icon provides visual reminder of shopping functionality
- Persistent navigation helps maintain orientation within the site

Recommendations Priority

- 1. Improve system status visibility with clearer active page indicators, cart confirmation animations, and checkout progress indicators
- 2. Enhance form validation with real-time feedback, clearer error messages, and field-specific guidance
- 3. Implement consistent spacing, typography, and responsive design across all views
- 4. Add confirmation dialogs for destructive actions and streamline the checkout process
- 5. Keep order summaries visible throughout checkout and improve empty state guidance
- 6. Standardize color application and improve contrast for better readability

Questionnaire Results: https://forms.gle/VyqVfwVvd2dcY9BJ7

Recommended Improvements Based on Feedback

Based on our user-centered design evaluation, the following improvements have already been implemented to address the key issues identified:

Navigation and Cart Functionality

1. Enhanced Active Page Indication

- Added prominent visual markers (border-bottom and bold font) to clearly indicate the current active page in navigation
 - Implemented consistent active state indicators across both desktop and mobile views

2. Improved Hover Effects

- Enhanced navigation items with more pronounced hover effects, including scaling (hover:scale-105) and font weight changes
 - Added transition animations to create smoother interaction

3. Page Transition Animations

- Implemented fade-in/fade-out transitions between pages to create a more cohesive browsing experience
 - Added smooth scrolling behavior when navigating between pages

4. Cart Preview on Hover

- Added a persistent cart preview dropdown that appears when hovering over the cart icon
- Preview shows product images, titles, quantities, and prices, plus a link to the full cart
- Provides immediate feedback on cart contents without navigating away

5. Enhanced Quantity Controls

- Improved quantity adjustment with more prominent plus/minus buttons
- Added focus states, rounded corners, and tooltips for better accessibility
- Increased button size and visual feedback on hover/interaction

6. Improved Empty Cart State

- Enhanced the empty cart UI with clearer guidance and multiple action paths
- Added animated elements to draw attention and create visual interest
- Provided direct links to both collection browsing and homepage
- Included encouraging messaging to guide users toward next steps

Form Feedback and Validation

7. Real-time Form Validation

- Implemented immediate feedback during form input rather than only after submission
- Added clear visual indicators that update as users type

8. Enhanced Error Indication

- Improved the visibility of error states with contrasting colors and icons
- Added specific error messages that appear directly below form fields

9. Visual Confirmation for Valid Input

- Added positive feedback (check icons and green highlights) when fields contain valid input
- Helps users track their progress through forms

10. Password Strength Indicator

- Added a visual strength meter that updates as users create passwords

- Provides real-time guidance on password security

Visual Design and Layout

11. Consistent Brand Colors

- Applied a unified color scheme throughout the interface to maintain visual consistency
- Used color psychology to guide user attention to important elements

12. Responsive Layout Improvements

- Enhanced the mobile experience with better-adapted layouts and controls
- Ensured consistent spacing and positioning across device sizes

13. "Edit Cart" option during checkout

- Added a button in the order summary section that allows users to navigate back to the cart page while in the checkout process
- The button is styled to match the overall design and includes a cart icon for better visual recognition

14. Improved order confirmation

- Enhanced the order confirmation page with detailed information including:
- Shipping information (name, address, phone)
- Payment method used
- A detailed order summary with items, quantities, and prices
- Total amount calculation
- Added a more organized layout with sections and improved visual hierarchy
- Maintains the existing action buttons for viewing orders or continuing shopping

15. Confirmation dialogs for product removal

- Added a modal confirmation dialog when removing products in the admin panel
- The dialog displays the product name and warns that the action cannot be undone
- Provides clear Cancel and Remove options
- Includes animation for smooth appearance
- Implements proper state management to track which product is being deleted
- These implemented improvements directly address many of the key issues identified in our user evaluation and already contribute to a better overall user experience.

Evaluation Effectiveness

Strengths of Our Approach

- Direct involvement of representative users provided authentic feedback

- Multiple evaluation techniques allowed for comprehensive issue identification
- Focused testing sessions identified the most critical usability concerns
- The combination of qualitative and quantitative data provided holistic insights
- Specific actionable recommendations were identified for immediate implementation

Limitations

- Small sample size may not represent all user perspectives
- Time constraints limited the depth of testing
- Limited testing environments (primarily desktop browsers)
- Lack of longitudinal data to assess long-term satisfaction

Conclusion

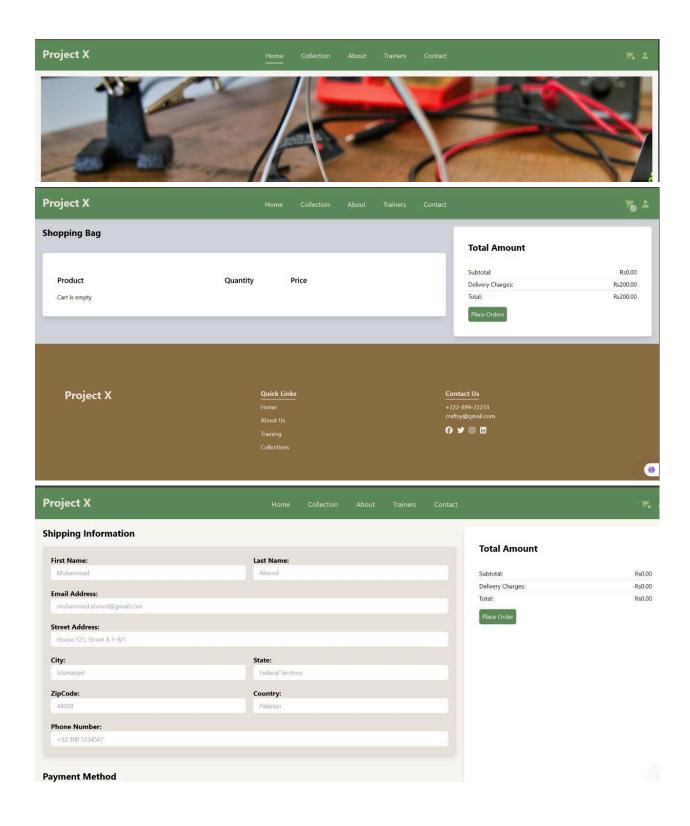
The evaluation phase effectively identified both strengths and areas for improvement in Project X's interface. By involving representative users, we gained practical insights that will guide our design refinements. The current implementation has a solid foundation but requires several targeted improvements to enhance user experience.

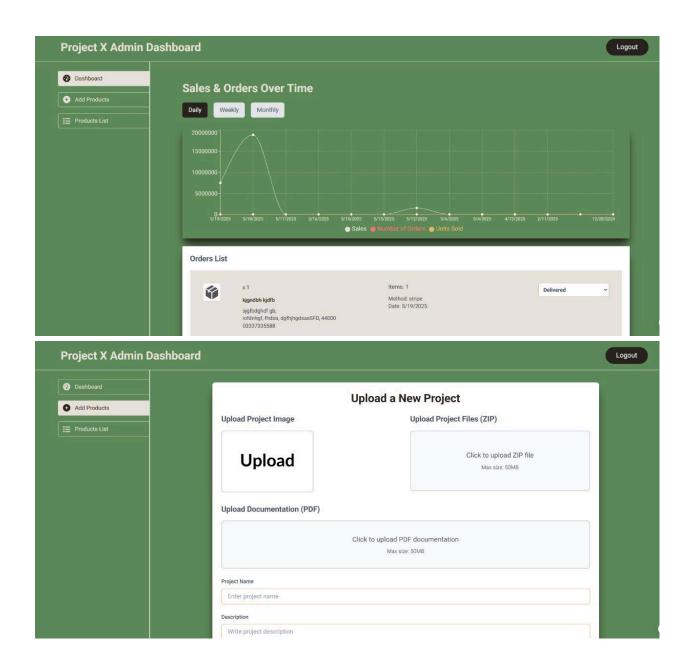
Our recommended changes focus on improving navigation clarity, streamlining the cart and checkout experience, enhancing the seller panel functionality, improving visual consistency, and implementing robust form validation. By addressing these areas, Project X can better meet user needs and expectations, resulting in an intuitive and satisfying e-commerce experience for both sellers and buyers.

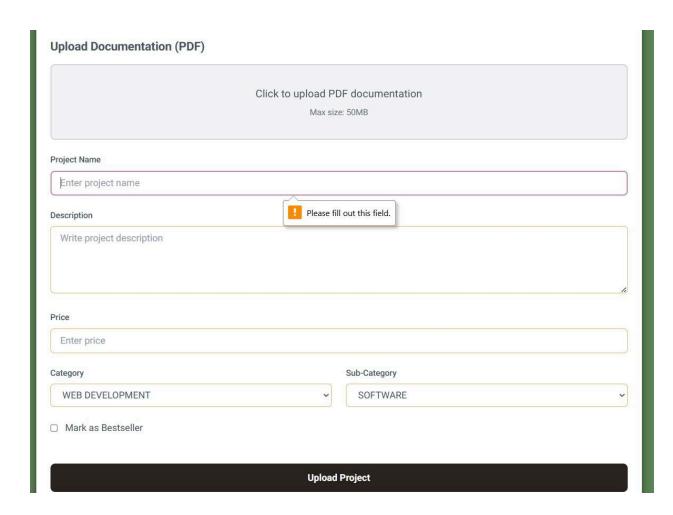
Appendices

Appendix A: Current Design Documentation

- Screenshots of Key Components Before Changes







First Name:	Last Name:	
Muhammad	Ahmed	
This field is required.	This field is required.	
Email Address:		
muhammad.ahmed@gmail.com		
This field is required.		
Street Address:		
House 123, Street 4, F-8/1		
This field is required.		
City:	State:	
Islamabad	Federal Territory	
This field is required.	This field is required.	
ZipCode:	Country:	
44000	Pakistan	
This field is required.	This field is required.	
Phone Number:		
+92 300 1234567		
This field is required.		
ZipCode:		
hello		
ZipCode must be 5-10 digits.		
Phone Number:		
033556633		
Phone number must be 10-15 digits.		
mail Address:		
aimen		

- Screenshots of Key Components After Changes

