



College of Engineering

Department of Software Engineering

SCD Assignment

Title: Utilizing the Prototyping Model and Figma for Component-Based
Software Design: A Local E-Commerce Application

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1. Introduction

The software development process requires a systematic approach to ensure that the final product meets user needs while adhering to best practices in design and implementation. For this project, the **Prototyping Model** was selected as the Software Development Life Cycle (SDLC) model, and **Figma** was used as the implementation tool to create a high-fidelity design of a local e-commerce mobile application. This document explores the use of these tools in achieving a robust component-based software design, highlights their advantages, and illustrates how iterative feedback cycles were used to refine the design.

2. The Prototyping Model

The Prototyping Model emphasizes creating an early, simplified version of a product to gather user feedback. This iterative approach ensures that requirements are well-understood and implemented before final development. Key stages of the Prototyping Model include:

- 1. Requirement Elicitation:** Engaging stakeholders to identify core features and functionalities.
- 2. Prototype Development:** Creating initial prototypes that reflect the basic structure and functionality.
- 3. User Evaluation:** Presenting the prototype to users for feedback.
- 4. Refinement:** Iteratively improving the design based on feedback until the final product aligns with user needs.

This model was particularly suitable for the project as it allowed for continuous stakeholder involvement, ensuring that the final design met their expectations.

3. Figma as an Implementation Tool

Figma is a cloud-based design platform that enables the creation of interactive, high-fidelity prototypes. It supports collaborative workflows, though this project followed a more traditional approach. Key features of Figma that contributed to the project include:

- **Prototyping:** Linking design elements to create interactive mockups, simulating user experience.
- **Component-Based Design:** Using reusable components to maintain consistency and modularity.
- **Ease of Iteration:** Allowing rapid changes and updates based on feedback.

These features aligned well with the principles of component-based software engineering, where modularity and separation of concerns were central to the design process.

4. Project Overview: Local E-Commerce Application

The local e-commerce application was designed to cater to outfit shops, providing them with a platform to showcase their products, interact with customers, and facilitate transactions. The application included the following features:

- **Product Showcase:** Dynamic galleries for displaying product listings.
- **Customer Interaction:** A chat feature to enable direct communication.
- **Purchasing and Payments:** Options for selecting, purchasing, and paying for products within the app.
- **Delivery Arrangements:** Integration of delivery scheduling and tracking functionalities.
- **Promotional Tools:** Features for posting discounts and special offers.

The design encapsulated these functionalities while maintaining a clear separation of concerns, ensuring that each feature operated as an independent component within the overall application.

5. Development Process

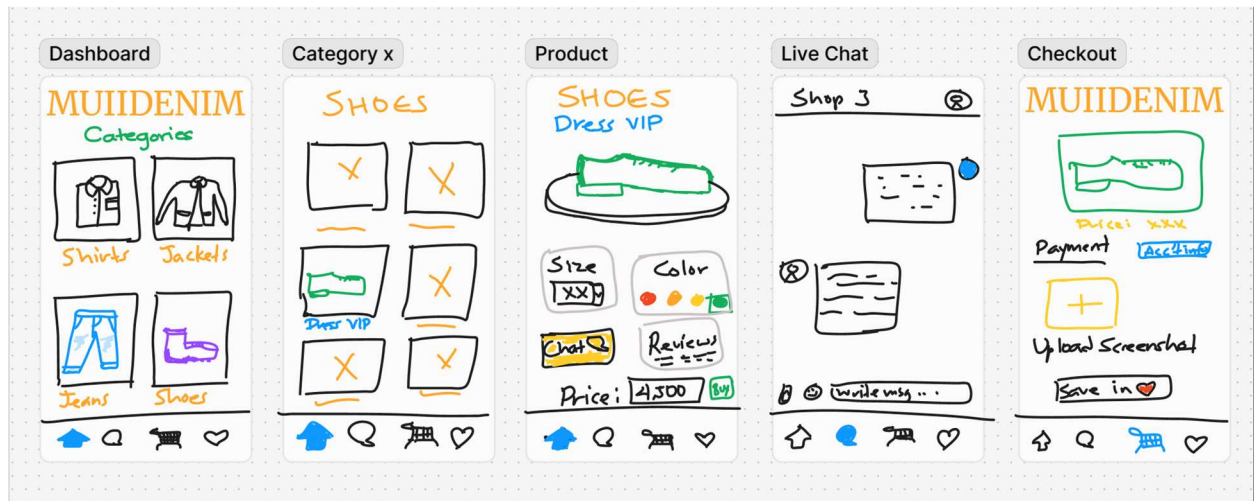
5.1. Requirement Elicitation

The project began with requirement elicitation through interviews with potential users, primarily local outfit shop owners. The key takeaways included the need for a user-friendly interface, seamless navigation, and efficient customer interaction mechanisms.

5.2. First Prototype

Based on the elicited requirements, the initial prototype was developed in Figma. This version focused on:

- Structuring the app's navigation.
- Visualizing key screens, such as the home page, product pages, and chat section.
- Creating a basic interaction flow for testing user navigation.



5.3. Feedback and Iteration

Users provided feedback on the first prototype, highlighting areas for improvement, such as:

- Simplifying navigation for faster product access.
- Enhancing the chat feature to include notifications.
- Improving the visual appeal of the product listing pages.

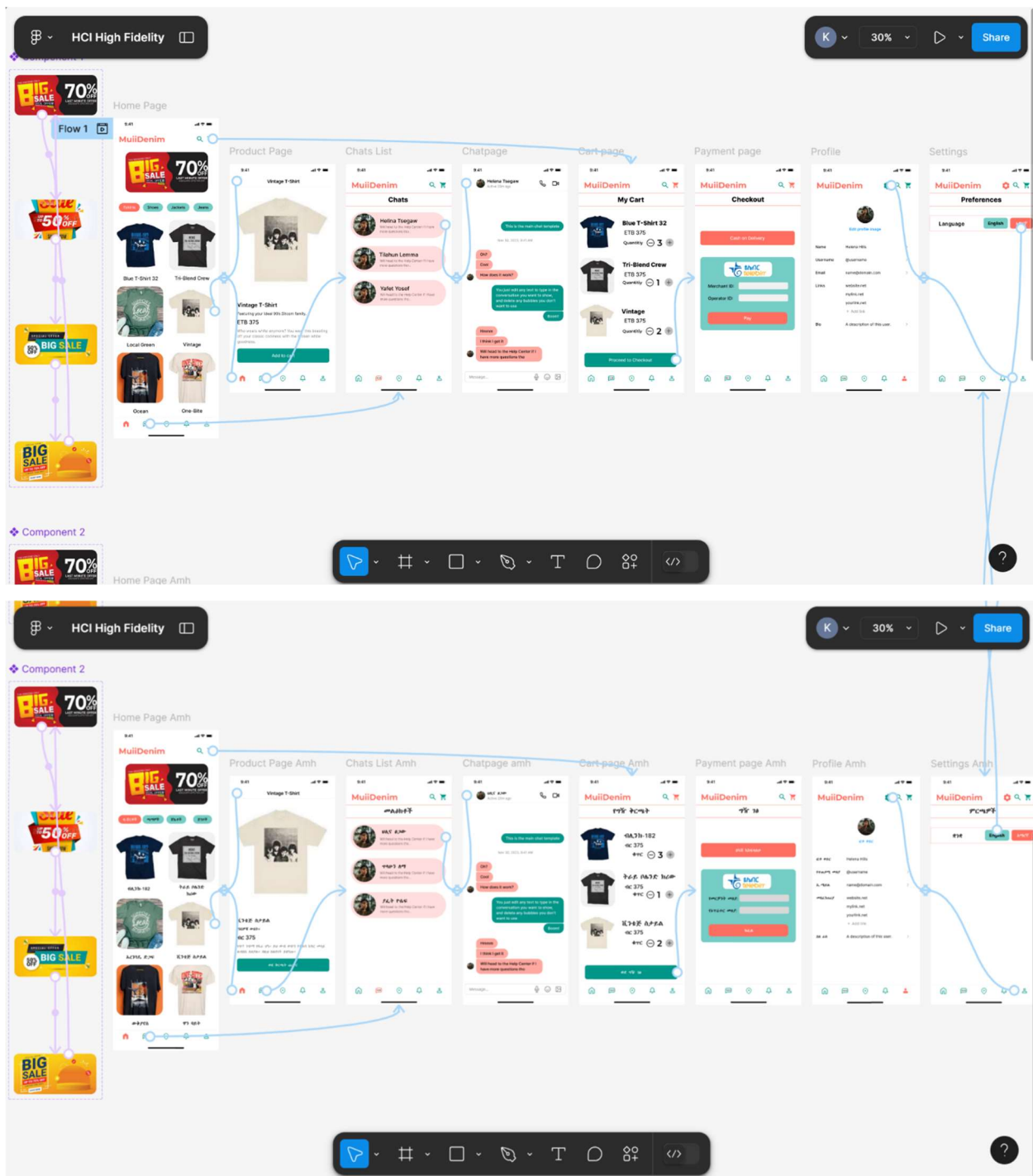
The prototype was refined based on this feedback, incorporating requested changes while maintaining design consistency.

5.4. Final High-Fidelity Design

The final iteration resulted in a high-fidelity prototype that addressed all feedback and demonstrated the complete functionality of the app. Key components included:

- 1. Homepage:** Showcasing featured products and promotional offers.
- 2. Product Details Page:** Displaying product images, descriptions, prices, and purchase options.
- 3. Chat Section:** Enabling real-time communication with customers.
- 4. Checkout and Payment:** A streamlined process for purchasing products and arranging delivery.

Design screenshots are below:



6. Component-Based Design Principles

The design of the application adhered to the principles of component-based software engineering, specifically:

- 1. Separation of Concerns:** Each feature (e.g., product showcase, chat, payment) was treated as an independent component, ensuring modularity and ease of future maintenance.
- 2. Reusability:** Common elements, such as buttons, input fields, and navigation menus, were designed as reusable components in Figma.
- 3. Consistency:** The use of a centralized design system ensured uniformity across all screens and components.

7. Challenges and Lessons Learned

While the project successfully leveraged the Prototyping Model and Figma, several challenges were encountered:

- **Manual Workflow:** The lack of collaborative tools occasionally slowed down iteration cycles.
- **User Feedback:** Balancing diverse user needs required careful prioritization during design refinement.

Key lessons included the importance of clear communication with stakeholders and the value of iterative testing in achieving user satisfaction.

8. Conclusion

The combination of the Prototyping Model and Figma proved effective in creating a robust, high-fidelity design for the local e-commerce application. The iterative approach ensured that the final product aligned with user needs, while the component-based design principles enhanced modularity and maintainability. By integrating user feedback into each iteration, the project demonstrated how design and methodology can work together to deliver a user-centric solution.

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