Reverse Commerce (Re-Commerce) Design for the Sale of Secondhand Eco print Products as an Implementation of Circular Economy in Indonesia

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ABSTRACT

Keywords: Re-Commerce; Ecoprint, Circular Economy; User Experience; Double Diamond; Empathy Map

The fashion industry contributes greatly to environmental pollution due to high production waste. One solution to reduce this impact is through the concept of a circular economy by encouraging sustainable consumption behavior, including re-commerce or reselling used goods. This study aims to design a re-commerce platform for used ecoprint products as an implementation of a circular economy in Indonesia. The methods used are the Double Diamond and Empathy Map approaches to understand user needs and design a wireframe-based UI/UX prototype. The results of the study indicate that there is great potential in the development of ecoprint re-commerce in Indonesia, supported by consumer awareness of environmentally friendly products. The designed platform, "Selaras", offers main features such as buying and selling used ecoprint products, online garage sales, and upcycling boutiques. In conclusion, this re-commerce design can be an innovative solution in extending the life cycle of fashion products and encouraging sustainable consumption behavior in Indonesia.

Introduction

In the 2020-2024 National Medium-Term Development Plan (RPJMN)**, the** textile sector is one of the national priorities. There are several national priority agendas in this development plan including strengthening economic resilience for quality and equitable growth, developing the environment, increasing disaster resilience, and climate change. The Circular Economy is under the umbrella of Low Carbon Development (LDC) which is also an effort to achieve a green economy through the development of environmentally friendly industries (Arista, 2022; Berg & Magnus, 2020).

The textile sector generates 80% of waste in the production phase. Waste is a substance that threatens the environment and is one of the factors that cause climate change. One of the eco-friendly raw material options for apparel manufacturing is natural fibers. Natural fibers have a medium-level impact on water and land use but have low carbon emissions in production (Allafi et al., 2021). Natural fibers, such as organic cotton, require less water and chemicals in the production process. The biodegradability of

organic cotton is considered to be faster and less harmful than the biodegradability of synthetic fibers (Khattab et al., 2020).

The main controllers that can affect the level of carbon emissions in the fashion industry are the operations under the responsibility of the brand and the marketing or retail model (Reason et al., 2016). Strategies in the value chain and the need for sustainable product variations can be used as opportunities for the industry to help consumers make choices. According to the Fashion and Climate Report, actions that the fashion industry can take to move towards sustainable production are:

- Reduce emissions from upstream production, such as in the base material operation process
- Reduce emissions from brand operations such as packaging and shipping.
- Encourage environmentally conscious behavior in consumers

Based on these three areas, ecoprinting products have contributed positively to all aspects. The main raw materials for ecoprinting fabrics, namely organic cotton and cellulose fibers, use low amounts of pesticides and fertilizers in the growing process. Based on observation data, more than 10 ecoprinting merchants in Bekasi district choose to use paper-based packaging and most of them sell offline at exhibitions to reduce the carbon footprint in the process of distributing goods to consumers (Hermiati et al., 2023). Entrepreneurs who own ecoprinting boutiques emphasize the value of sustainability in their products to educate consumers on sustainable dressing options and strive to innovate through the Indonesian Eco-Printer Association (AEPI). AEPI has a vision for consumer education and research based on Indonesian local wisdom. This makes ecoprinting products in general have a cleaner production and packaging process compared to non-eco-friendly products.

The ecosystem of ecoprints in Indonesia in terms of producers and consumers has been systematically built, so this product is suitable to be the object of designing a re-commerce business model. Re-commerce or reverse commerce is the sale of goods that are already owned in both new and used conditions through an online distribution. Initially, re-commerce was popular among Chinese consumers who wanted to adopt a sustainable lifestyle. However, this trend is expanding well into the rest of the world as it is considered to have many benefits both in terms of economic growth and the environment.

The implementation of the circular economy in the textile sector in Indonesia is an opportunity for researchers to develop a re-commerce business model design that offers services in the field of fashion, especially ecoprint products.

Method
Broadly speaking, this research uses the following framework:
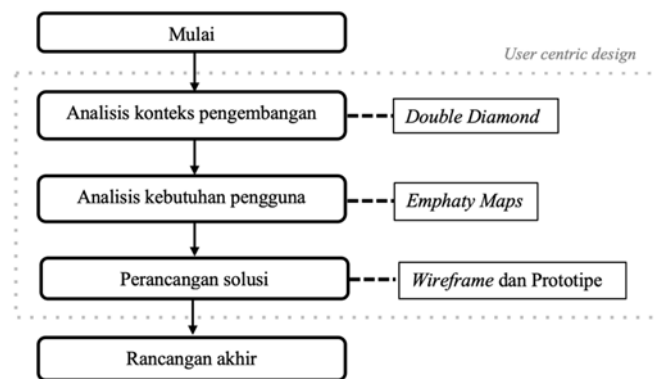
Ecoprint re-commerce development research framework

Double Diamond

The double diamond modeling used in this research oversees the collaboration design process. This modeling has 4 phases that need to be analyzed including, discover (research), define (synthesis), develop (ideas), and deliver (implementation). This method is used to find the main problem and find the most appropriate way to solve it (Banbury et al., 2021).

Empathy map

Empathy map is a business modeling by making humans the center of development. The selection of consumer segmentation in accordance with the research objectives affects the accuracy of product analysis. The main purpose of consumer empathy mapping is to provide services that meet the needs of users. The end result of the mapping will show cross-demographic characteristics and form a better understanding of consumer behavior. Empathy map consists of 6 (six) quadrants of questions organized into a chart based on 5W (what, who, when, why, where) and 1H (how) (Agustav et al., 2017).

Solution Design

The design is done by visualizing the features to be developed through the creation of wireframes and prototypes (Gunawan et al., 2023). This design is made with the help of Figma design application tools. Interactive interface prototypes are used to display the visuals of the product and test basic functionality to get feedback from users.

Results and Discussion
Double Diamond

The double diamond approach is used to assist the user-centered product development process and is analyzed through 4 phases namely discover, define, develop, and deliver. Each phase is determined from a process of brainstorming and consumer observation, and literature review related to sustainability topics. This approach describes a consumer-centered analysis process that results in an understanding of consumption

patterns based on individual, community, and social perspectives (Arman & Mark-Herbert, 2021).

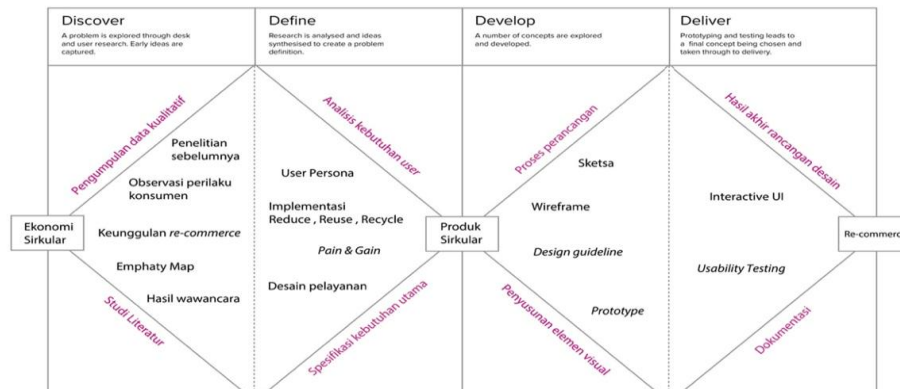The analysis of the double diamond results for the development of ecoprint re-commerce is as follows:

Figure 1. Double diamond analysis for product design

From the four quadrants, the development of each point is described as follows:

● Discover/Research Quadrant:
1. Not many re-commerce in Indonesia are environmentally oriented.
2. Re-commerce innovation supports the implementation of the circular economy (Kirchherr et al., 2017).
3. The cradle to cradle system can be implemented to realize the buying and selling activities of used goods (Shove et al., 2012).
4. Ecoprint in Indonesia has an integrated consumer community.

● Define/Synthesize quadrant:
1. Recommerce will open up new markets.
2. Bringing together buyers & sellers of green consumers.
3. Used goods have new value with environmentally-oriented product communication.
4. Making ecoprint consumers the representatives of the green consumer community.

● Develop/Ideation Quadrant
1. Features to match with tailors to repair clothes.
2. Re-commerce website for ecoprint eco-friendly products.
3. Design an upcycling service with buying and selling of upcycled goods.
4. Online decluttering/sorting and second-hand selling services.

● Deliver/Implementation
1. Tailor meet feature.
2. A re-commerce website with the name "Selaras".

3. Features of the upcycling boutique.
4. "Online garage sale" feature with "live shopping".

Empathy map

Before creating an empathy map, determining the user persona needs to be done based on the target user who wants to be observed. The persona is then created an empathy map that will be useful for predicting solutions based on the specific user's point of view (Gunasekara et al., 2023). The mapping of recommerce user targets takes data from observations on ecoprint forum conversations as a depiction of consumer feelings.

The conclusion of each quadrant of the empathy map is as follows:

Says - The motivation for buying and selling ecoprint products is to sell/get good quality products at the right price without buying new products or piling up old unused products.

Do - The tendency of action is to contact the closest relatives and research on the internet because they want to find a trusted buyer who has an interest in ecoprint products.

Feel - In general, users' feelings are both excited about the act of reuse and anxious about getting an item with a bad history or not meeting the desired qualifications.

Think - Users expect a platform that facilitates reduce, reuse, recycle actions and can make it a community to gather with users who have similar values.
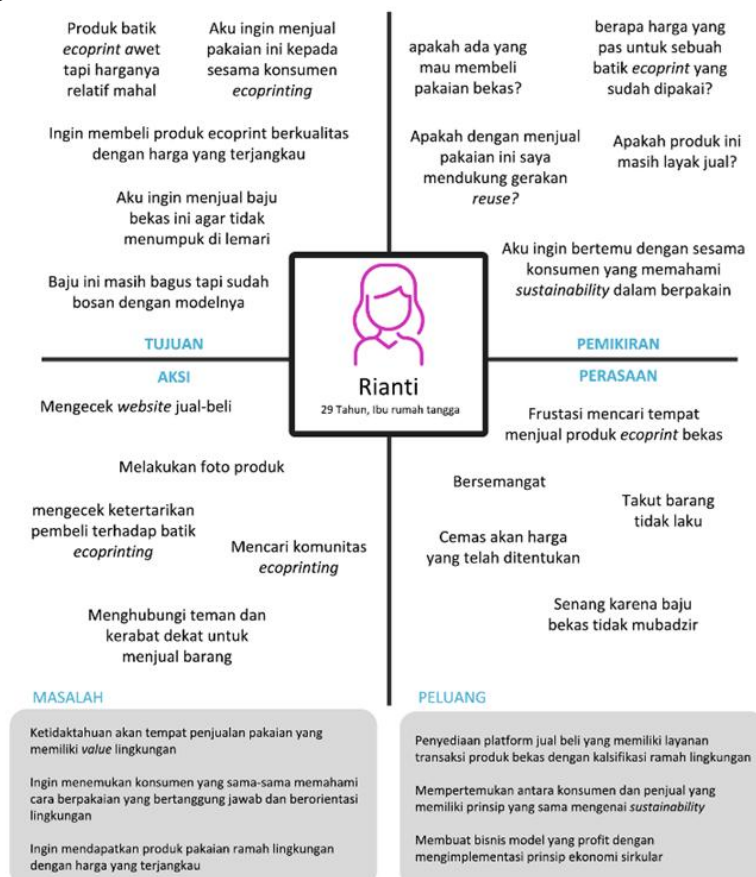

Figure 2. Emphaty Map Consumer Ecoprinting

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Solution Design
Wireframe

Wireframe is a low fidelity design that shows the basic form of elements and solution design. Wireframe creation is divided into 5 based on the main needs, namely the boarding page, service content page, item sales page, product detail page, upcycle boutique and online garage sale. Before doing the wireframe process, display sketches were done using the crazy 8 method which aims to explore variations in layout and appearance. Wireframes and sketches help visualize the design so that it can be used as an effective tool to gather feedback from other designers before entering the hi fidelity design stage (Leen et al., 2017).
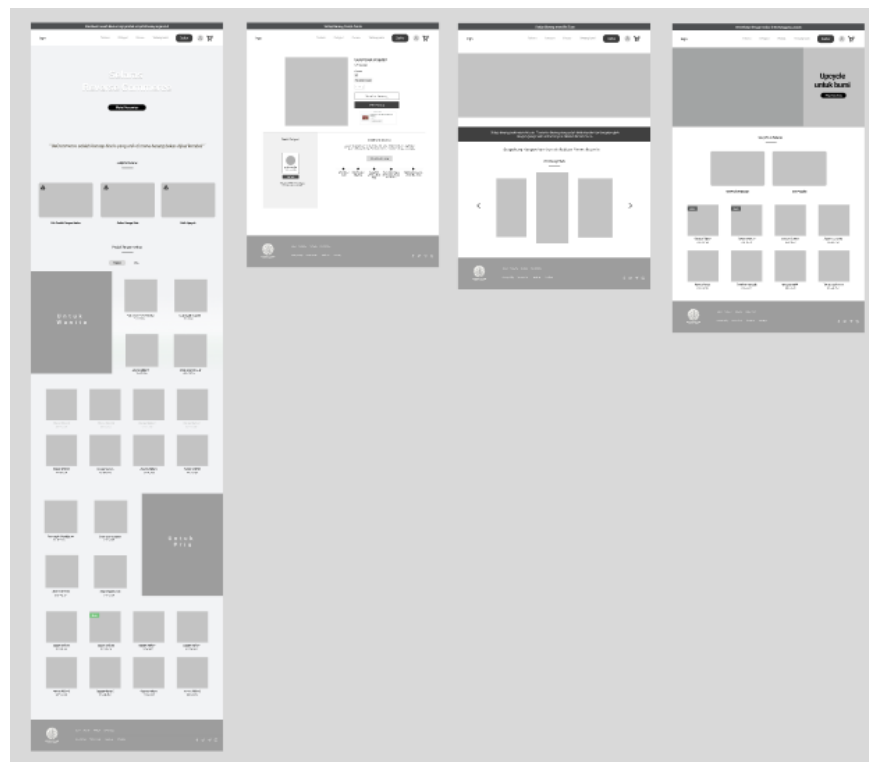

Figure 3. Ecoprinting re-commerce research framework

Hi-Fidelity Prototype

The prototype is projected to be the final product of re-commerce so it is necessary to ensure that the design has met the minimum needs of users with adequate display aesthetics. In every product development process, the iteration process is necessary because the first prototype usually only implements basic functions and does not illustrate the full and complete product concept as expected. The interface of the re-commerce begins with a boarding page that has the main function of introducing the reverse commerce concept and navigating the page. To bring out the environmental theme, this re-commerce is named "Selaras" and has a clean design concept with a white primary color and green accents. The homepage has 4 main features which are menu page, service feed, main product, and footer.

The main concept of this product creation is sustainable fashion service design and is realized through 3 main features: second-hand product buying and selling, online garage sale, and upcycling boutique. The basic environmental approach of "reuse" is implemented to reduce the accumulation of fashion waste by encouraging people to use second-hand items and find new owners for old unused items.
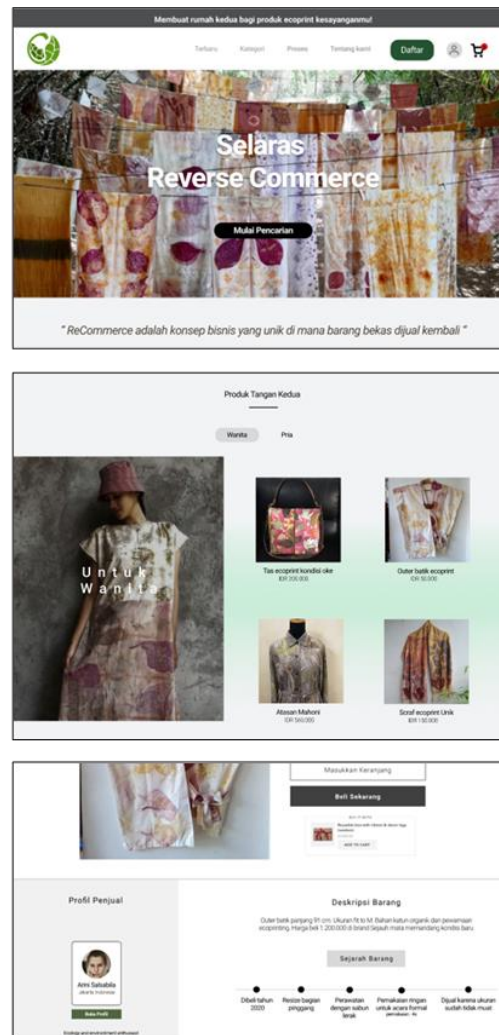

Figure 4. Framework Research re-commerce ecoprinting

The minimum success of this website is achieved when users can purchase or sell ecoprinting products and make payments. The time constraints of the journal made it impossible to conduct usability testing. However, future research needs to carry out these steps to see the level of interaction and motivation of users in making transactions on the Selaras re-commerece.

If done massively, responsible consumption behavior by utilizing this kind of e-commerce can support the circular economy in its efforts to preserve the environment through the action of extending product life through the cradle to cradle system. Environmental messages can be inserted in website interactions as a persuasive step to

increase public awareness and education about environmentally friendly products, one of which is ecoprinted products.

Conclusion

The results of the re-commerce design study for second-hand ecoprint products are as follows: The double diamond approach provides analysis data that re-commerce has the potential to grow in Indonesia because it is starting to form a consumer base that can be fulfilled through the implementation of second-hand product buying and selling features, online warehouse washing services, and upcycling boutiques. Empathy map describes that the persona of Indonesian adults in the age range of 20-35 years has a motivation to sell/buy second-hand ecoprint products because they want quality goods transactions at affordable prices with a tendency to transact with individuals who have the same understanding of ecoprint products. Consumers feel excited in marketing second-hand products because they feel satisfied that they have taken the action of reuse while feeling anxious if the product has difficulty meeting the right buyer, therefore a platform that can bring together sellers and buyers who have the same vision of environmentally friendly products has been used by consumers. The implementation process of the ecoprint re-commerce interface is done with a wireframe process that serves to design the layout and initial appearance. The wireframe was then developed into a hi-fidelity prototype that has a clean design concept with dominant white and green colors, and has 3 main display features, namely buying and selling second-hand products, online warehouse washing services, and upcycling boutiques.
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