

Re: Use: Empowering Sustainable Fashion through a Preowned Clothes Marketplace and Recycling Platform

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Abstract

The fashion industry is a major contributor to environmental issues such as waste generation, greenhouse gas emissions, and water pollution. To address this problem, we propose a mobile application called "Re:Use" that enables the reuse and recycling of pre owned clothes. The app connects individuals who have unwanted clothes with manufacturing industries that can repurpose them or with NGOs that can distribute them to those in need. The app also features a recycling platform that processes worn-out clothes into new textile products, reducing waste and promoting sustainability. Machine learning algorithms are utilized to enhance user experience and optimize the process of matching buyers and sellers. The project is not only an opportunity to promote sustainable fashion but also to empower local communities, foster a circular economy, and contribute to global environmental efforts

Keywords: Pre owned clothes, Recycling platform, Machine learning algorithms, Manufacturing industries, NGOs, Sustainability, Circular economy, Mobile application

1. INTRODUCTION

The "Re:Use" project is a mobile application that addresses the environmental issues of the fashion industry by promoting sustainable fashion, circular economy, and empowering local communities. The app uses keywords such as pre owned clothes, recycling platform, machine learning algorithms, manufacturing industries, NGOs, and sustainability to connect buyers and sellers of secondhand clothes, as well as to facilitate the recycling of worn-out clothes into new textile products. This project is an opportunity to make a significant contribution to the global environmental effort and promote a sustainable fashion industry that benefits everyone involved.

2. MOTIVATION

The motivation behind the above project is to address the environmental and social issues associated with the fashion industry. Fast fashion and the culture of constantly buying new clothes has led to significant carbon emissions, water wastage, and textile waste. The project aims to promote sustainable fashion practices and reduce the negative impact of the fashion industry on the environment. Additionally, the project seeks to promote social equity by providing an avenue for donating pre-owned clothes to those in

need. The motivation behind the project is to contribute to a more sustainable and equitable society.

3. RELEVANCE OF THE PROJECT

The above project is relevant in addressing the environmental concerns and ethical issues associated with the textile industry. It provides a sustainable solution for reducing textile waste and promoting the reuse of pre-owned clothes. The use of machine learning in the app enhances its efficiency and accuracy in sorting and categorizing clothes. The app also promotes community involvement by encouraging users to donate pre-owned clothes to NGOs, which helps to support various social causes. Overall, the project aligns with the United Nations Sustainable Development Goals (SDGs) of responsible consumption and production and partnerships for the goals.

4. PROPOSED METHODOLOGY

- 1. Development of the mobile application:** The first step is to develop a mobile application that allows users to easily buy and sell preowned clothes. This application will use machine learning algorithms to categorize clothes based on their quality and condition.
- 2. Partnership with NGOs and manufacturing industries:** The second step is to establish partnerships with NGOs and manufacturing industries to ensure that the preowned clothes are put to good use. The NGOs can distribute the clothes to people in need, while the manufacturing industries can recycle the clothes to create new products.
- 3. User interface design:** The application will have a user-friendly interface that allows users to easily navigate the app, upload pictures of the clothes they want to sell, and browse through the available options for purchase. Integration with social media platforms: To increase the reach of the application, it will be integrated with social media platforms like Facebook and Instagram. This will allow users to share the clothes they are selling with their friends and followers.
- 4. Marketing strategy:** A comprehensive marketing strategy will be developed to promote the application and increase user engagement. This will include social media advertising, influencer partnerships, and targeted email campaigns.
- 5. Data analysis:** The application will be monitored using data analytics tools to track user engagement, identify areas for improvement, and make data-driven decisions for future updates.

Below is the sample app design with above features added to the application:-



Fig 4.1 Proposed System

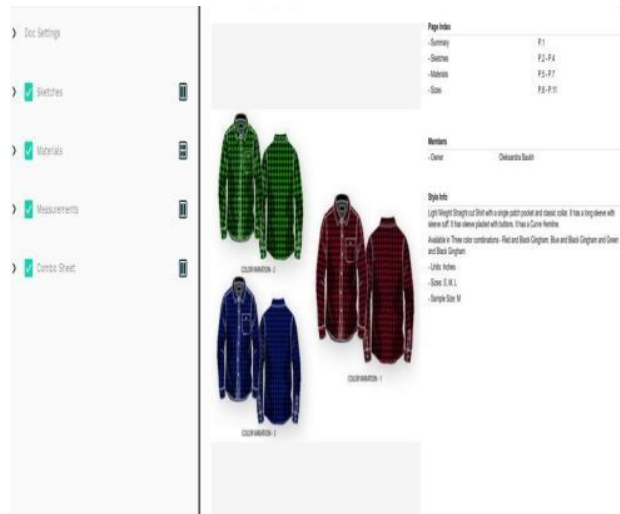


Fig 4.2 Sample data

Overall, this proposed methodology aims to create a sustainable solution for the textile waste problem while providing a convenient platform for users to buy and sell preowned clothes.

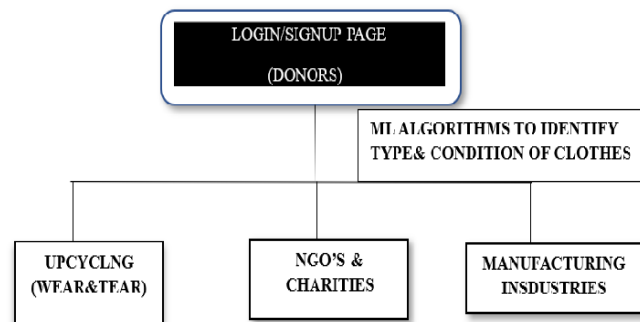


FIG 4.3 Flow Chart

APP STRUCTURE:

1. User opens the app and creates an account or logs in to an existing account.
2. User selects the option to donate or sell their preowned clothes.
3. User takes pictures of the clothes they wish to donate/sell and uploads them to the app.
4. App uses machine learning algorithms to identify the type and condition of the clothes and suggest a suitable price.
5. User agrees to the suggested price or negotiates a different price with the buyer (if selling).
6. If donating, the app matches the user's clothes with NGOs or manufacturing industries in need of such clothes.
7. The user arranges for pick-up or delivery of the clothes.
8. The NGO or manufacturing industry receives the clothes and provides feedback to the user.
9. The user receives payment (if selling) or reward points for donating.
10. The app tracks the user's activity and provides personalized recommendations for future donations/sales.

ALGORITHMS AND TECHNOLOGIES USED:

Web and App development

1. Image recognition:

The app uses to recognize the type of clothes in the user's images, and suggest whether they can be donated or upcycled. This can help to reduce the chances of users donating clothes that are in too poor a condition for reuse, or trying to recycle items that are better off donated.

2. Recommendation engine:

To suggest new donation or recycling opportunities for users based on their previous donations or browsing history. This can help to encourage users to donate more frequently and to discover new ways to reduce their clothing waste.

3. Fraud detection:

To detect fraudulent activities such as fake donation claims or fake recycling centers. This can help to ensure that all donations and recycling efforts are legitimate and reach the intended beneficiaries.

4. User segmentation:

To segment users based on their donation or recycling history, demographics, and other data points. This can help to personalize the user experience and tailor recommendations to each individual user.

5. Predictive analytics:

To predict trends in clothing waste, such as which types of clothes are most commonly donated or recycled, or which regions have the highest concentration of clothing waste. This can help to identify new opportunities for donation or recycling efforts and optimize the app's overall impact.

SUCCESS METRICS:

1. Amount of clothing diverted from landfills:

This metric could track the amount of clothing that is donated to charities or recycled, as opposed to being thrown away in landfills. This helps to measure effectiveness of the project in reducing clothing waste and promoting sustainable practices.

2. Number of people served by donations:

This metric could track the number of people who receive donated clothing from NGOs or charities. This can help to measure the impact of the project in supporting those in need, such as people who are homeless or living in poverty.

3. Reduction in CO2 emissions:

This metric could track the amount of CO2 emissions that are avoided through the recycling of clothing, as opposed to the production of new clothing. This can help to measure the environmental impact of the project, and its contribution to reducing greenhouse gas emissions.

4. Reduction in water usage:

This metric could track the amount of water that is saved through the recycling of clothing, as opposed to the production of new clothing. This can help to measure the environmental impact of the project, and its contribution to conserving water resources.

5. LITERATURE SURVEY

Literature survey of the "Re:Use" project reveals that the fashion industry is one of the most polluting industries globally, with an enormous environmental impact. The production of new clothes requires a significant amount of resources, energy, and water, which leads to high carbon emissions, water

pollution, and textile waste. One solution to this problem is promoting a circular economy and sustainable fashion practices, which can be achieved by reusing and recycling clothes.

Mobile applications have been developed to facilitate the secondhand clothing market and promote sustainability. Studies have shown that mobile apps increase the convenience and accessibility of pre owned clothes, making it easier for users to buy and sell used clothing items. In addition, incorporating machine learning algorithms can improve the efficiency of the app, matching buyers and sellers based on their preferences and needs.

There are also examples of recycling platforms and initiatives that aim to repurpose worn-out clothes into new textile products. These initiatives promote a circular economy by reducing textile waste and providing a sustainable source of materials for the textile industry.

NGOs and manufacturing industries can also play an important role in promoting sustainable fashion. NGOs can act as intermediaries between donors and recipients, ensuring that the clothes are distributed to those in need. Manufacturing industries can benefit from using recycled textile materials, reducing their reliance on virgin resources and minimizing their environmental impact.

Overall, the literature survey highlights the importance and potential of the "Re:Use" project in promoting sustainable fashion and addressing the environmental impact of the fashion industry.

1. "The Potential of Pre-Owned Clothing in the Circular Fashion Economy" by C. Hong and H. Jeong (2021) This paper explores the role of pre-owned clothing in the circular fashion economy and its potential to reduce the negative environmental impact of the fashion industry. The authors argue that increasing the usage of pre-owned clothing can extend the life cycle of garments and reduce waste, thereby contributing to the sustainability of the fashion industry.
2. "Sustainable Consumption and the Second-hand Clothing Market: An Exploratory Study" by E. Santos and M. Alves (2019) This study investigates the factors influencing consumers' purchasing decisions in the second-hand clothing market. The authors conducted surveys and interviews with consumers in Portugal and found that factors such as price, quality, and uniqueness were important considerations. They also identified several barriers to the adoption of pre-owned clothing, including social stigma and a lack of awareness about the benefits of sustainable consumption.
3. "Closing the Loop: A Review of Second-Hand Fashion Apps" by C. Shwartz and M. Fleischmann (2018) This paper provides an overview of second-hand fashion apps and their potential to promote sustainability in the fashion industry. The authors reviewed several popular apps and assessed their features and functionality, as well as their potential impact on the environment. They conclude that second-hand fashion apps have the potential to increase the usage of pre-owned clothing and reduce waste, but also note several challenges in terms of user adoption and engagement.
4. "Consumer Attitudes towards Second-hand Clothing in the United Kingdom" by K. Heffron and R. Kitchin (2017) This study examines the attitudes and perceptions of consumers towards second-hand clothing in the UK. The authors found that consumers are becoming increasingly aware of the negative environmental impact of the fashion industry and are turning towards pre-owned clothing as a more sustainable alternative. However, they also identified several barriers to the adoption of second-hand clothing, including concerns over quality and hygiene.

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6. EXISTING SYSTEM

The existing system involves traditional methods of clothes disposal such as donation to charity, selling to second-hand stores, or throwing them away. These methods often result in wastage and pollution. Also, there is a lack of a streamlined platform that connects people who want to donate their preowned clothes with people who need them. Therefore, the roposed project aims to provide a solution to this problem by developing a mobile application that facilitates the process of donating and acquiring pre-owned clothes in a more sustainable and efficient manner.

7. FUTURE WORKS AND RESULTS

1. Blockchain:

Blockchain technology could be used to track the entire lifecycle of a piece of clothing, from its production to its eventual disposal or recycling. This could help to increase transparency and accountability in the fashion industry, and make it easier to identify opportunities for recycling or donation.

2. Augmented Reality:

Augmented reality (AR) could be used to create immersive experiences that promote sustainable practices in clothing production and consumption. For example, AR could be used to create virtual try-on experiences that help consumers visualize how clothes will look on them before making a purchase, reducing the likelihood of returns and waste.

3. 3D Printing:

3D printing technology could be used to create new clothing from recycled materials, reducing the need for new raw materials and minimizing waste in the production process.

4. Internet of Things (IoT):

IoT technology could be used to create smart clothing that is able to monitor and adjust to a wearer's temperature and comfort level, reducing the need for frequent washing and prolonging the life of the garment.

5. Artificial Intelligence (AI):

AI could be used to develop predictive models that forecast clothing demand and optimize the distribution of donated clothing. It could also be used to identify opportunities for recycling or upcycling used clothing.

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