DESIGN OF ABANDONED VEGETABLE AND FRUIT TRANSPORTATION SYSTEM BASED ON SUSTAINABLE DISTRIBUTED ECONOMY

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ABSTRACT

Designed for the ugly supply of fruit and vegetable products in Changsha, Hunan Province, China, to reduce food waste and increase the economic income of all parties involved. Through the establishment of an online fruit and vegetable distribution and trading platform, we will establish various workshops offline, and cooperate with local NGOs, farmers, restaurants, and wholesalers to carry out online and offline dual-platform models. By improving the design of the overall supply method, the income of local farmers has been increased, the waste of ugly fruits and vegetables has been reduced, the utilization rate of energy has been increased after composting, and the profit of stakeholders has been increased through trade fairness.

Key Words: sustainable distribution economy; Use-Oriented Services; Trade fairness; S.PSS

1. INTRODUCTION

China's cold chain transportation problem is about 12 million tons of fruit and 130 million tons of vegetables per year, with a total economic value of 10 billion US dollars[1]. In the logistics links of fruit and vegetables during picking, transportation and storage, the loss rate is 25% to 30%. The annual depletion of fruits and vegetables can meet the basic nutritional needs of 200 million people, and the loss is the highest in the world.

In China, due to ugliness or damage to the skin of fruits and vegetables, the fruits and vegetables of the defective fruits are seriously wasted. Take the Xinqiao Agricultural Products Logistics Center in the West Third Ring Road of Xi'an as an example. The wastage of fruits and vegetables caused by damaged skin and other causes is approximately 60 tons.

2. METHOD AND SYSTEM

2.1. Method

Based on the basic concepts of sustainable design and distributed economy, by integrating "products and services" to build "sustainable solutions" Sustainable Solution to meet consumer-specific needs, "results" and "benefits" to replace the consumption of material products, while at the same time reducing resource consumption and environmental pollution, and changing people's social life quality[2]. By using the steps of Strategic analysis; Exploring opportunities; System idea development; System design; System implement to design the service system, carry out design practice and evaluation, and then design iteration. Through the basic classification of product service system design, the use of product-oriented service system design means (Use-Oriented Services provides users with a platform, such as products, tools, opportunities and even qualifications to meet people's needs and wishes. In this service system design, the product and the service coexist, and the product is effectively integrated into the service[3]. The user can use but does not need to own the product, but only pays the specific time period or the consumption cost according to the agreement of the two parties. The redesign planning involves the service system of the stakeholders has been optimized to optimize the use of defective fruits and vegetables from the original product orientation to the use orientation. From simple sales to system-like services, the benefits of stakeholders have been improved, thus solving the problem. Distributed sustainable design through the redesign of economic networks and service systems consisting of fruits and vegetables and stakeholders.

This paper takes the fruit farmers and vegetable farmers in rural areas of Changsha City, Hunan Province, China as the research personas, and designs the systematic product service system for the local waste fruit and vegetable waste problem. Through local surveys and expert interviews with local farmers, bazaars, local NGOs, institutions, supermarkets, customers, restaurants and fertilizer plants, combined with local statistics, the main causes of defective fruits and vegetables, namely the appearance of fruits and vegetables, were analysed.

Ugly fruits and vegetables are partially damaged and slightly spoiled due to weather conditions such as hail. The current treatment methods for defective fruits and vegetables are analysed.

The treatment methods are generally divided into two types: the first one is for suppliers to collect from local farmer's parks, and the unselected fruits and vegetables are directly rolled on the road and then passed to the cleaning department; The second is to treat the gradually decaying fruits and vegetables in the farmer's market, discard them and collect them for disposal by the cleaning department. In response to the above-mentioned massive waste problem, a practical-oriented service product system design was carried out.

2.2. System

The design of the new and defective fruit and vegetable delivery system designed in this paper is in the form of a dual platform, namely the online deployment platform and the offline workshop platform.

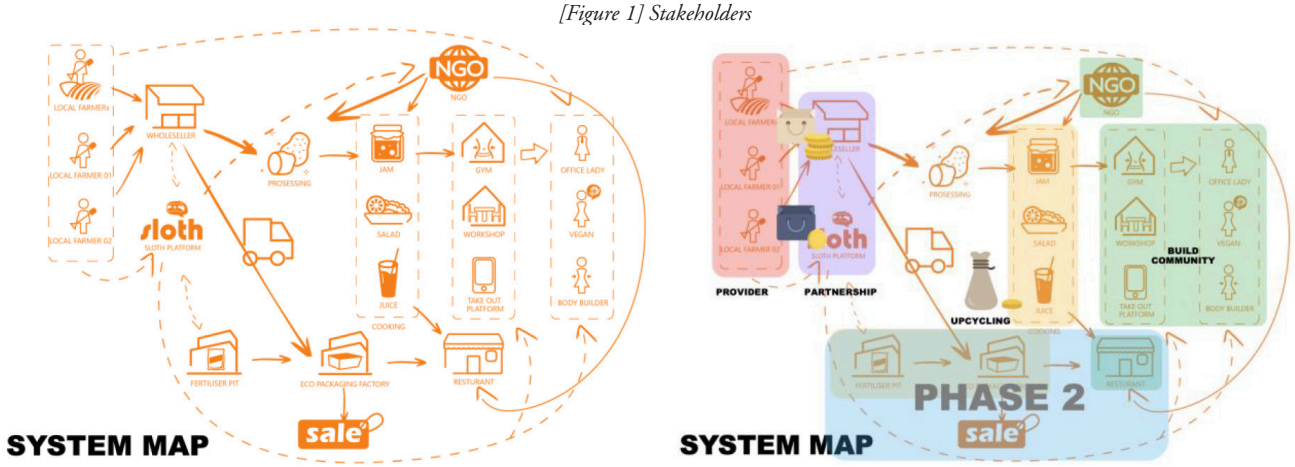
For the online platform, first, the local farmers can sell the main sales to the local wholesalers. The defective fruits and vegetables are recycled by the local cooperative NGOs through the platform, and the booths are set up in the wholesalers, also by the cooperative NGOs. Recycling of defective fruits and vegetables. After recycling, cooperate with local NGOs to screen the fruits and vegetables and rough them. Among them, the higher quality fruits and vegetables are processed by rough processing, some are delivered to local restaurants, Gyms and other places; the other part is handed over to NGOs for public welfare social activities. Corruption and serious corruption of fruits and vegetables in wholesalers and farmer households are connected through local platforms, collected by local fertilizer plants and packaging plants, and produced in eco-friendly environmentally friendly packaging such as composting and vegetable paper packaging. Farmers receive fertilizers and product packaging reward.

Secondly, consumers can make appointments for workshop activities through the online platform and can communicate with farmers online to achieve trade fairness; for the offline experience platform, the main function is to provide consumers with experience, consumers can pass the offline workshops carry out simple food processing, juice pressing, and popularizing basic sustainable environmental concepts.

There are two types of profitability of the platform, which are profitable by directly selling the products, such as selling rough-processed products to restaurants and gyms; and selling raw materials to fertilizer plants and packaging plants for industrial production; Services purchased by consumers, such as workshops and monthly packages.

The first phase is the establishment of online and offline platforms and the realization of cooperation with fertilizer plants and subsequent packaging plants. Business Category. The second stage is to cooperate with fertilizer and packaging manufacturing plants to promote a win-win situation for farmers and them (Figure 2).

[Figure 1] Stakeholders



[Figure 2] System map

3. RESULT

Through design, the utilization rate of defective fruits and vegetables has been improved, and people's understanding of sustainable concepts has been raised. The realization of trade equity has increased the income of stakeholders in the project, especially the income of local farmers.

3.1. Impact

For economic:

1) Reduction in food waste and greenhouse gases; 2) Fully utilizing local resources minimizing landfill demand; 3) reducing the root cause for growing surplus crops with better communication platform;

For social:

1) Increasing employment opportunities for local area; 2) Rising awareness and directly helping Local BOP by cooperating with NGOs; 3) Allowing different local stakeholders to understand the environmental problems and impact; 4) Connecting different stakeholders within the local area, from rural to city and individuals to business; 5) Integrating a new standard on food safety standard hence reduce wastage and improve individual well-being.

For Ecological:

1) Up cycling add value to unwanted materials; 2) Fair trade for local farmers, minimizing destructive competitions; 3) Cost saving opportunities for local businesses and NGOs.

At the same time, due to the influence of cost control, manpower deployment and other factors, the completion of the service system design will be divided into two phases.

Sustainability impact: In general, the waste of fruits and vegetables is greatly reduced, the income of stakeholders is increased, trade fairness is promoted, and public awareness of food waste is raised.

3.2. STAKEHOLDERS

The defective fruit and vegetable delivery system design has different benefits for different stakeholders:

1) For farmers:

Real trade fairness can be achieved by recycling defective fruits and vegetables, which can increase the household income of local farmers; by cooperating with local fertilizer plants, the cost of agricultural activities can be reduced; through online and offline communication Activities can help them cooperate with large-scale bazaars, restaurants and other industries to expand sales and increase farmers' income.

2) For consumers:

you can eat the fruits and vegetables of the place of origin and communicate with the producers of the place of production, food safety is guaranteed, and the concept of sustainable development is popularized.

3) For local NGOs:

Expand the influence of local NGOs and provide raw materials for their public welfare activities to save operating costs.

4) For fertilizer plants and packaging plants:

providing a large amount of raw materials can help it reduce production costs and increase profits.

4. CONCLUSION

Increase the income of local farmers and related personnel through online and offline dual platforms. Reduced waste of resources, increased fertilizer production, and reduced pollution and waste. Through the change of business model, help multiple parties achieve a win-win situation.

In the actual work, there are some shortcomings: more manpower and material resources are needed for sorting; there are certain difficulties in the promotion of ugly fruits and vegetables; the shortage of professional personnel and other problems cause problems such as shortage of offline platform personnel.

In the actual work that follows, the "participants" will be changed into "implementers". Through a series of trainings, the past production and management mode of farmers will become a new model of production, promotion and consumption.

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