

The Construction and Research and Analysis of the Environmental Protection Platform of Old Things in Smart Campus

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Abstract: With the in-depth development of environmental protection concept and smart campus, intelligent campus environmental protection has become an important issue. Through the analysis of existing research and platform cases, this paper proposes the architecture and functional modules of the old environmental protection platform of colleges and universities based on the concept of environmental protection, including article information release, old material recycling and resource reuse. At the same time, by analyzing the challenges faced in the process of platform construction, this paper proposes solutions, and verifies the effectiveness and feasibility of the smart campus old environmental protection platform through research and data analysis.

1. Introduction

In 2016, the Ministry of Environmental Protection of the People's Republic of China issued the "Overall Plan for the Construction of Big Data for the Ecological Environment", which clearly stated that the full use of big data, the Internet and other modern information technology means to promote the improvement of environmental governance system and governance capabilities. At present, people around the world pay more and more attention to environmental protection, as an educational place, schools should play an important leading role in environmental protection [1]. On the other hand, due to the new trend of thinking of college students and keeping up with the development trend of the times, they will be more exquisite in purchasing items, the quality is relatively higher, and the speed of replacement will be faster. Therefore, after research and analysis, create an environmental protection platform for the recycling of old things in colleges and universities. On the one hand, make full use of old material resources through donation and sale, and give full play to the residual value of resources; On the other hand, we will establish cooperation with related enterprises and factories to provide services such as processing and resale of used goods to alleviate the current situation of difficulties in disposing of old things on campus [2]. Based on the combination of environmental protection and modern information technology [3], this paper can not only solve the problem of school old property management, but also cultivate

students' environmental awareness and sustainable development concept, promote the recycling of resources and the development of environmental protection, and promote sustainable social and economic development.

2. Overview of the Environmental Protection Platform for Old Things on the Smart Campus

(1) The relationship between the smart campus environment and the recycling of old things

The Smart Campus Environmental Protection Platform applies information and communication technology to all aspects of the campus, providing a digital platform to facilitate information sharing and communication among school members [4]. After the completion of the platform, it will have a significant impact on the environmental protection cause of old material recycling, and at the same time promote the recycling of old things more convenient and convenient, it will also have a positive effect on China's environmental protection cause. First of all, in terms of old material recycling, the platform will greatly improve the efficiency of old material recycling after completion, and provide students and faculty with an intelligent, digital and modern convenient service platform. When students have old clothes or other items, they can fill in the corresponding information on the platform and decide whether to donate the old items or sell them in the school or resell them through the market, so as to improve the recycling and disposal efficiency of the school's old things [5]. The statistics of campus resource recycling are shown in Figure 1. The figure is the degree of awareness of the disposal of old things among college students in 2022, and it can be seen from the figure that the proportion of freshmen is 16%, the smallest proportion, and the largest is juniors, accounting for 39%.

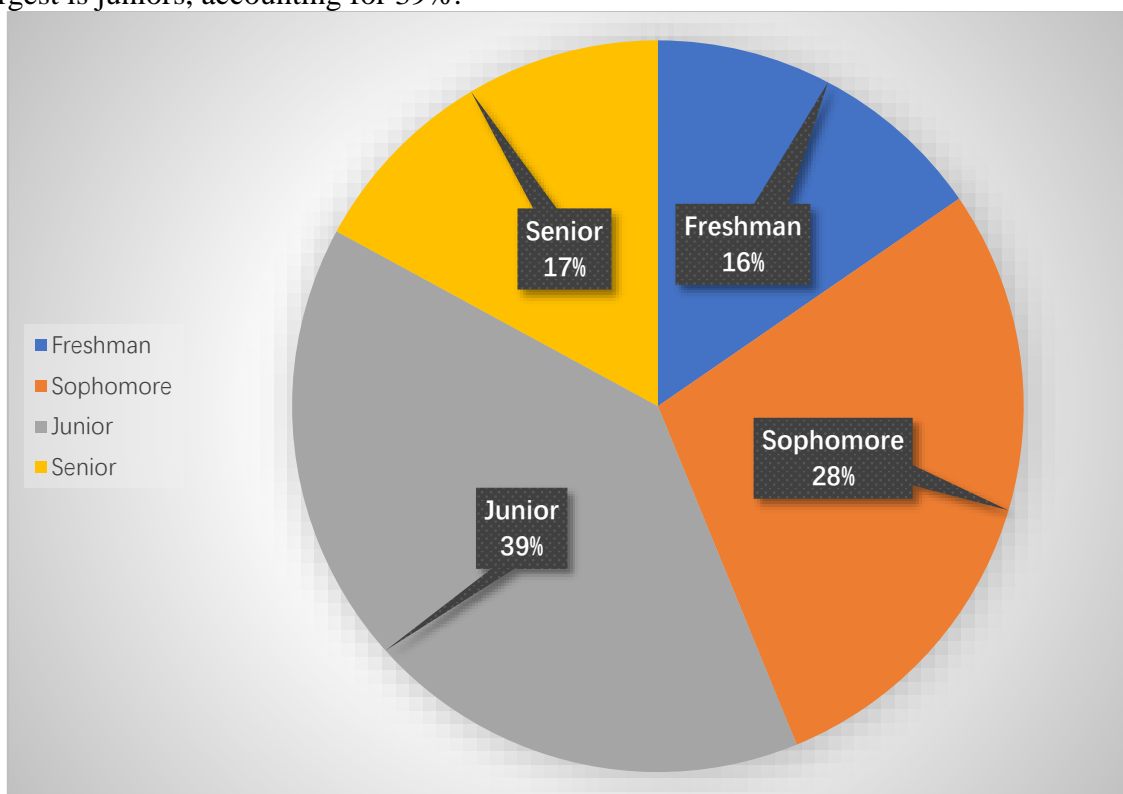


Figure 1: Recycling of old materials in some universities

(2) The needs and challenges of platform construction

Demand: The school needs an integrated, information-based and standardized old things disposal platform, which can improve the efficiency of campus environmental management, integrate

environmental data resources, and timely discover hidden dangers in the campus environment; in accordance with the principle of "comprehensive coverage, layered governance, and block recycling" [6], implement campus environmental protection work and promote the long-term and stable development of campus environmental protection. At present, the analysis of second-hand market demand is2and the scale of second-hand e-commerce transactions has shown a rapid growth trend, from 94.74 billion yuan in 2017 to 480.204 billion yuan in 2022. It can be seen that China's second-hand e-commerce market has great development potential.

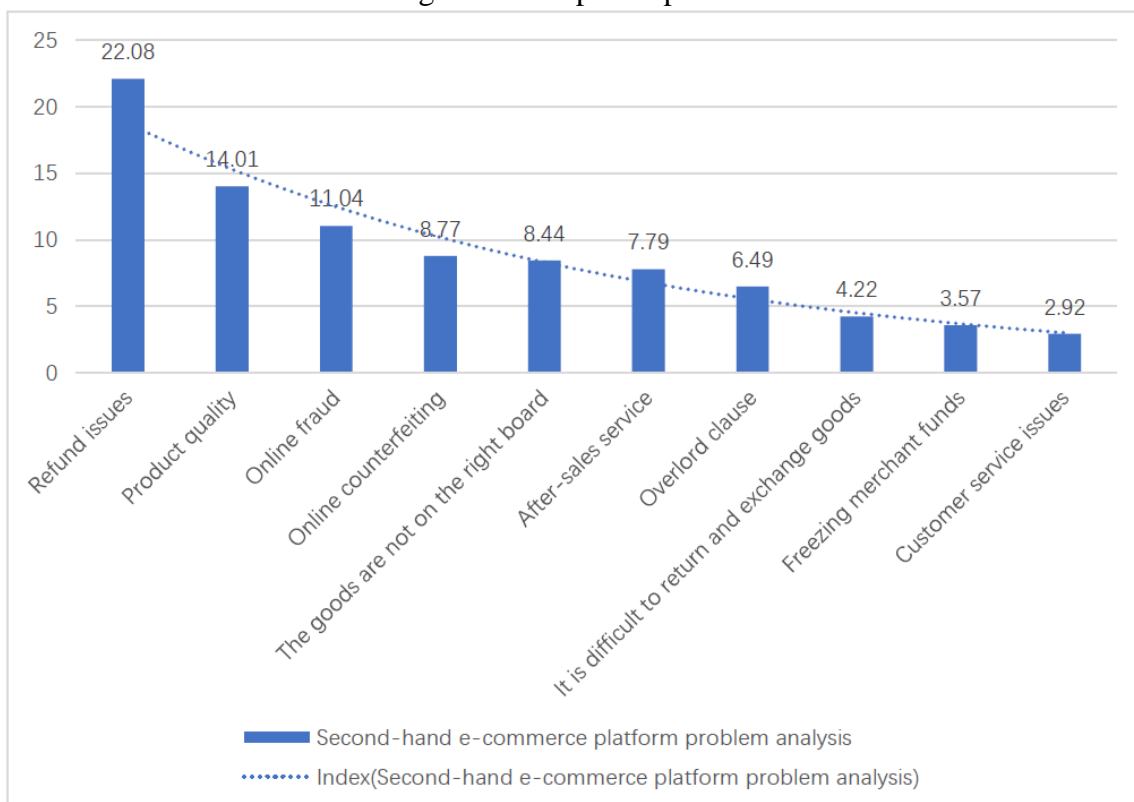


Figure 2: Second-hand e-commerce transaction scale trend from 2017 to 2022

Challenges: Schools often already have a variety of different systems and platforms, integrate these systems, and ensure data consistency and smooth information interaction, which may face technical and organizational challenges; at the same time, building a platform school needs to have the appropriate technical architecture and facilities, including network infrastructure, servers, Data storage and processing capacity, etc. which require schools to upgrade and adjust their infrastructure [7]; secondly, the management of the platform is staff, staff and students, and need to adapt to the requirements of the platform and receive corresponding training to make full use of the platform's functions and services; and finally, the platform involves a large amount of data collection, storage and processing. Schools need to establish appropriate data management mechanisms to ensure data security [8]. In recent years3goods quality, after-sales, funds, etc. have huge loopholes, while meeting customer needs, but also make customers worry that the emergence of these problems will have an impact on their own interests, it can be seen that the development of China's second-hand e-commerce market still has hidden dangers that need to be solved urgently.

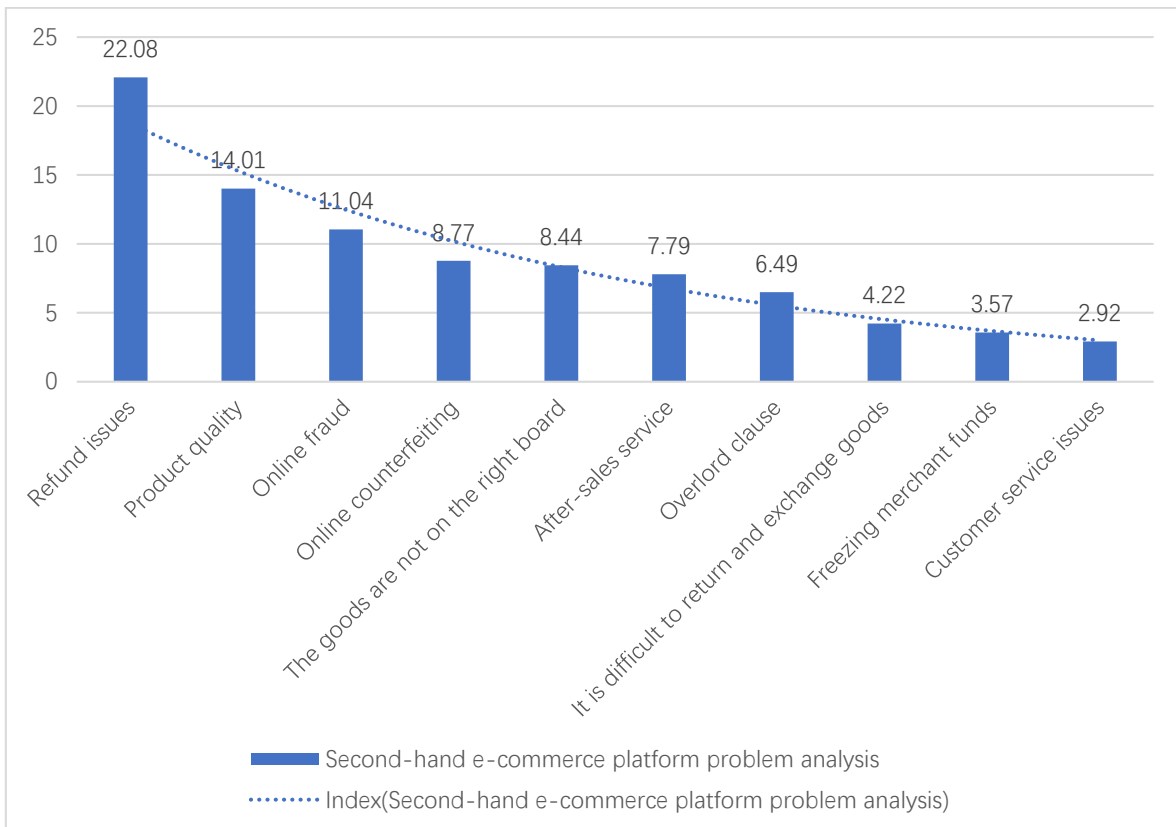


Figure 3: Analysis of second-hand e-commerce platforms

(3) The significance and value of the smart campus old environmental protection platform

Environmental significance: The smart campus old material environmental protection platform can promote the effective use and recycling of resources. Through the platform, schools can provide a mechanism for centralized management of old items, recycling and reuse, reducing waste and negative environmental impacts. This helps to reduce waste generation, thereby protecting the environment and the sustainable development of ecosystems [9].

Educational value: The establishment of a smart campus environmental protection platform can provide a platform for teachers and students to practice environmental awareness and action. By participating in the process of recycling, sorting and reusing old items, students can learn the knowledge and skills of environmental protection and resource recycling, and establish environmental awareness and sustainable development values.

Resource optimization: Through the establishment of the smart campus old things environmental protection platform, the school can achieve effective management and resource optimization of old items. Many old items can be recycled and reused to reduce the consumption of new resources, thus saving costs and resources. This has a positive impact on the economic viability and sustainable development of the school [10].

Social impact: Establishing a smart campus environmental platform can have a positive impact on society as a whole. Through the demonstration and guidance of the campus, more social institutions and individuals will be encouraged to participate in environmental protection actions, form an environmental protection atmosphere and action force of the whole society, and promote the sustainable development of society.

3. The Construction Framework of the Smart Campus Old Environmental Protection Platform

The smart campus environmental protection platform needs a user management system to manage the users of the platform, including school teachers and students, management personnel and enterprise participants. The user management system can realize user registration, login authentication, authority management and other functions to ensure the safe and legal use of the platform. At the same time, the platform can collect and analyze the collected old things data, as well as the user's operation behavior and feedback with the help of data analysis and reporting functions. This can help schools understand the effectiveness of recycling and reusing old things, optimize the platform's operational strategy, and provide relevant data and reports to relevant stakeholders. This platform is mainly App, including WeChat mini programs, official accounts, Douyin operations and other content, by adding donor registration, publishing relevant environmental protection articles, environmental protection news, environmental protection tips, etc. to strengthen the environmental awareness of students and staff, and set up designated recycling boxes and appointment procedures, you can book recycling services on each platform, and the platform has a special person responsible for door-to-door reception [11].

Item donation and exchange function module

Workers get in touch with the relevant Hope Project through the school Youth League Committee, make free public welfare donations and do a good job in publicity. Establish a used goods trading service platform, and set up a special intelligent receiving site in the public place of the school or under the dormitory.

Resource recovery and utilization module

Sales personnel reach an agreement with off-campus used recycling and processing enterprises, so that the used things in the school can be reprocessed or sold, and receive and manage through the procedures under the platform, maximize customer needs, establish an online market operation model, contact the person in charge of the used goods market, and open up the high-end used goods resale network market. Among them, the proportion of second-hand product classification is mainly shown in Figure4, the main municipal daily necessities. Among them, school supplies accounted for 40%, daily necessities accounted for 31%, and shoes, clothing, and beauty supplies also reached 18%.

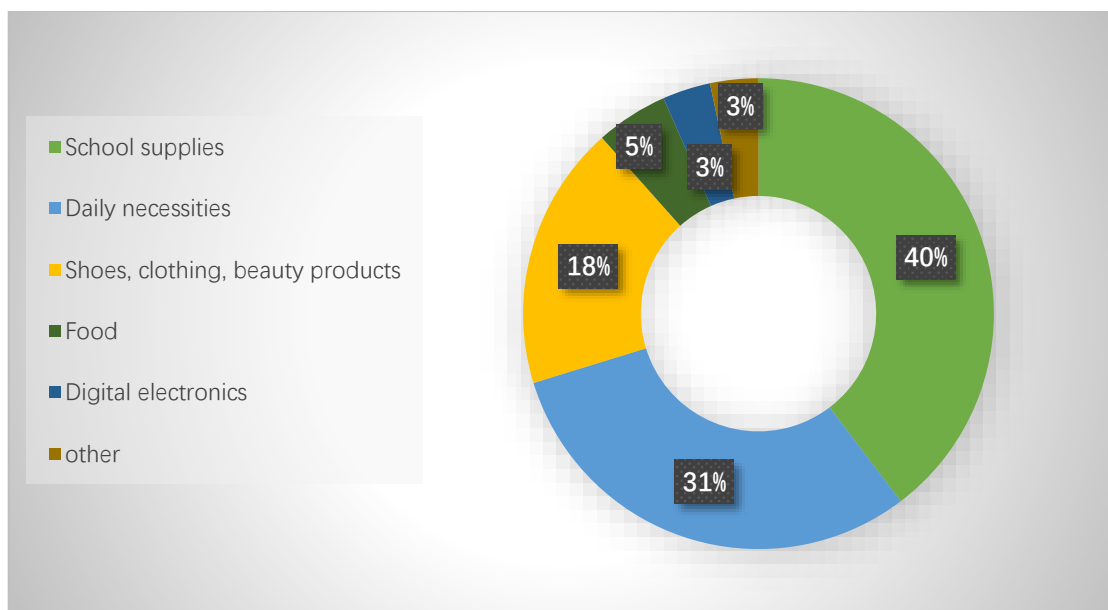


Figure 4: Classification of second-hand products

4. Marketing and Promotion of Smart Campus Old Environmental Protection Platform

(1) Online promotion [12]

Managers regularly publish campus activity information on public accounts, moments and other platforms; In addition, the promotion and publicity is mainly carried out with posters in the school, By these means students can understand the relevant information of the platform;

Managers should ensure the release of campus information such as campus part-time jobs, campus activities, lost and found, and environmental protection messages; Publish work-study position information, and the platform is responsible for joining after training.

(2) Offline publicity

The offline platform cooperates with the school league committee, student union and other community organizations to regularly hold old goods recycling exchange meetings to increase the influence of the platform, and at the same time, relying on express delivery stations and canteens, self-service sites such as service platforms and lockers are set up to provide used goods receiving and accessing services, and a general service desk is set up, mainly to solve the after-sales problems of the platform.

Marketing strategy [13]

①Low price combined with high price

The biggest selling point of second-hand goods is the affordable price, to make full use of this advantage, to ensure the basic economic resources of the platform, and for high-quality, good brand second-hand products, we through professional appraisal to do a good job of evaluation, play their due value.

②Brand and publicity building

Building a platform's brand image is key to attracting users. Engineers should establish the core values and strengths of the platform and highlight them in marketing campaigns so that users can feel the unique value of the platform. Use multiple channels for publicity and expand the visibility and influence of the platform. Information on the platform can be disseminated through the school's internal bulletin board, official website, social media platform, campus TV station, etc., to attract the attention and participation of users.

③User participation incentives

Platform gives users incentives to engage with the platform, increasing their engagement and frequency of use. Design a reward mechanism to give users rewards such as points, gifts or coupons for donating old items or participating in recycling actions. Data analysis of the smart campus old environmental protection platform. The main marketing channels are shown in Figure 5.

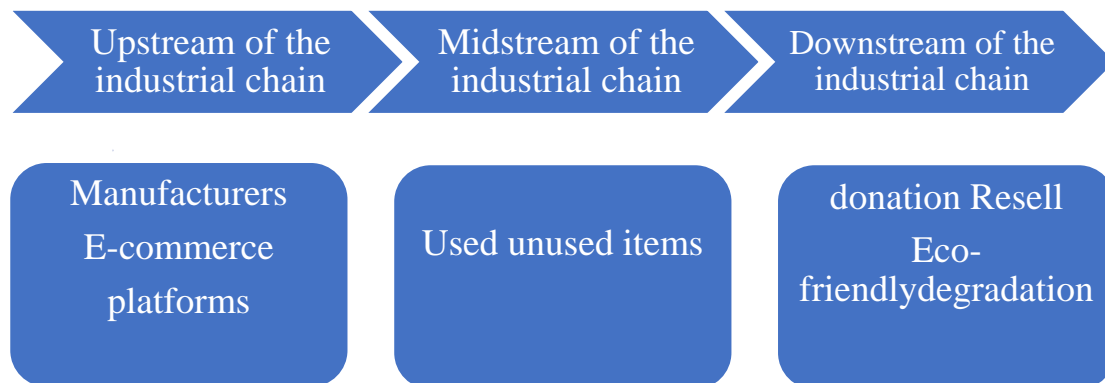


Figure 5: Distribution of industrial chain

5. The Feasibility of Platform Construction [14]

The smart campus environmental protection platform establishes a complete technical support system, including the development of websites or applications, the construction of servers and databases, etc. It also facilitates users to donate, recycle and exchange old items, and provide corresponding search, information publishing and interactive functions. At the same time, by integrating resources inside and outside the campus, including the school's management department, student organizations, environmental protection volunteer groups, etc., we will establish cooperative relations with relevant enterprises, such as environmental protection organizations, second-hand goods trading platforms, etc., to expand the influence and resources of the platform.

The smart campus establish management and supervision mechanisms to ensure the effective operation of the platform, including establishing the management team of the platform, formulating corresponding rules and regulations and operating procedures, monitoring the use and transaction behavior of the platform, and handling disputes and problems between users.

To improve user engagement, the viability of the platform depends on user engagement and promotion effectiveness. Platform managers need to actively guide campus teachers and students to participate in the use and promotion of the platform, attract users through publicity activities, reward mechanisms, education promotion, etc., and provide good user experience and services to increase user stickiness and satisfaction.

The feasibility of the smart campus environmental protection platform also needs to consider the sustainable development of the business model. They can obtain revenue through advertising, partner fees, product sales, etc. to support the operation and development of the platform.

6. Summary

First, to promote resource recycling, the platform can provide a convenient channel for teachers and students on campus to recycle, donate and exchange old items. We should realize the reuse of resources, reducing waste and consumption. Secondly, to stimulate environmental awareness, through the smart campus old things environmental protection platform, we can promote the concept of environmental protection and sustainable development to teachers and students [15]. The platform can provide environmental protection knowledge, skills and practical cases, encourage students to actively participate in environmental protection actions, so as to cultivate their environmental awareness and sense of responsibility, and promote the development of environmental protection on campus. Third, to promote cooperation and sharing, the smart campus old material environmental protection platform can promote cooperation and sharing inside and outside the school. Schools can establish cooperative relationships with environmental protection organizations, enterprises or other schools, share environmental protection resources, information and experience on the platform, jointly carry out environmental protection projects and activities, realize resource sharing and complementary advantages, and promote the development of campus environmental protection. Finally, to cultivate innovation and practical ability, the Smart Campus Old Things Environmental Protection Platform encourages students to participate in environmental protection activities and projects, providing opportunities for practice and innovation. Students can exercise their innovative thinking, problem-solving ability and teamwork spirit, cultivate practical ability and innovative spirit, and provide strong support for their comprehensive quality development by carrying out environmental protection related activities and projects on the platform.

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