

Research on "Internet Standardized" Garbage Sorting Market Operation Method--Taking University Garbage Sorting as an Example

Lihao Wang, Shoucai Li, Kaiyue Qu, Anzhe Wang, Fan Chen *

Department of Management Engineering, Qingdao University of Technology, Qingdao, Shandong, 266000

* Corresponding author: chenfan312088@163.com

Abstract. With the advent of the Internet era and the improvement of people's living standards, more and more garbage is generated per capita. In order to explore the market-oriented operation of garbage sorting in China, this paper takes universities as an example and creates the "Internet+standardized" university garbage sorting market-oriented operation alliance to test the effect of garbage recycling projects in universities. In the initial stage of the project, the unique conditions such as strong environmental awareness, huge amount of domestic waste, high recyclable rate and regular work and rest are the inherent advantages for promoting waste classification reform. In the implementation process, this paper will establish an integrated platform benefiting schools, students, merchants and recycling enterprises, form a market-based mechanism with a multi-body linkage for resource recovery and reuse, raise the environmental awareness of college students, and explore a suitable path for waste separation to be implemented in China.

Keywords: Waste classification, Resource recycling, University pilot, Internet, Big data analysis.

1. Introduction

With the advent of the Internet era and the improvement of people's living standards, more and more garbage are generated per capita, and if the garbage can be recycled, it can be turned into treasure, which can reduce environmental pollution and avoid the waste of resources.

However, in the current Chinese market, there is still no perfect waste recycling industry chain, the national awareness of waste recycling is weak, and the market system of waste recycling is not perfect. At present, most of the garbage sorting programs are government-led, with large investments and small returns, and the public has little initiative to put out garbage. For such market status, we conducted market research on foreign markets and some domestic waste separation pilot projects, and found that the main reason for the difficulty of perfecting the waste separation system is that the national environmental awareness is weak and cannot consciously carry out waste separation, plus many enterprises are unwilling to invest in waste recycling projects due to the current drawbacks of high investment costs and long recovery periods [1].

After researching the current market situation and analyzing and studying the national policies, we decided to start from universities and created the "Internet Standardized" university waste classification market operation alliance to test the effect of waste recycling projects in universities. In order to achieve the effective use of resources [2], China put forward the idea of waste separation as early as 1996, and has also introduced corresponding policies to encourage waste separation for all people in recent years, for example, in June 2019, the Notice on the Comprehensive Development of Domestic Waste Separation in Prefectural and Above Cities and the Law of the People's Republic of China on the Prevention and Control of Solid Waste Pollution in the Environment (Draft Revision) were released one after another, which put forward requirements for each The "Notice on the Comprehensive Implementation of Domestic Waste Separation in Cities at the Prefectural Level and Above" and the "Draft Amendment to the Law of the People's Republic of China on the Prevention and Control of Solid Waste Pollution and the Environment" were released in June 2009, which put forward requirements for waste separation in each city, and provided incentives such as funding and government support to encourage each enterprise to develop waste recycling projects. In this paper,

we propose the "Internet + standardized" market operation scheme for waste classification in universities, trying to use the "Internet" as the technical means and standardized waste classification as the basis to encourage college students to take the initiative to classify waste in each university by using a new market mechanism, so as to improve their awareness of environmental protection. To raise the awareness of environmental protection among college students and explore a suitable way to implement waste separation in China.

2. "Internet+standardized" market-oriented waste separation operation method as a whole

These unique conditions, such as high environmental awareness, huge amount of domestic waste, high recyclable rate, and regular work and rest, are the innate advantages of promoting waste separation reform in universities [4].

In order to achieve the recycling of resources, there existed a market mechanism that was not in scale before the trial of waste separation. However, the current trial of waste separation is mostly government-led, with large investments and small returns, and poor initiative of the public in putting out waste. Therefore, the "Internet+Standardized" university waste classification market operation alliance (Green Bubble Co., Ltd.), using the "Internet" as a technical means, based on standardized waste classification, to explore the integration of schools, students, businesses and recycling enterprises to benefit from the (see below) to form a market-oriented mechanism for resource recycling, and to promote the construction of a beautiful campus and ecological civilization [3]. Relationship among the subjects of "Internet standardized" university waste classification market-oriented alliance is shown in figure 1.

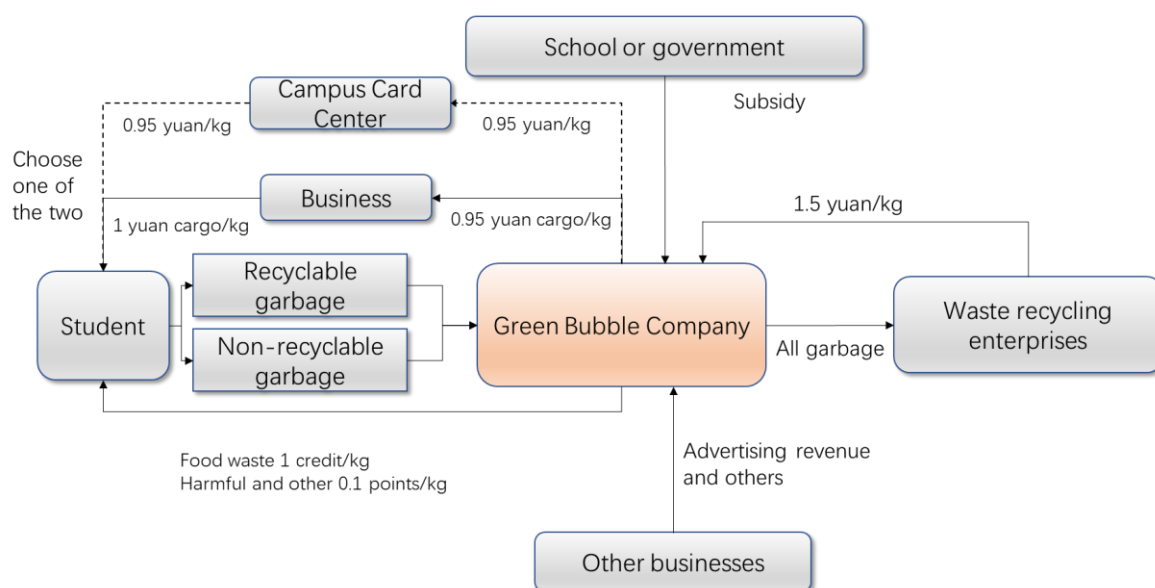


Figure 1. Relationship among the subjects of "Internet+standardized" university waste classification market-oriented alliance

3. "Internet+standardized" market-oriented waste separation operation innovation point

3.1. Constructing a market mechanism for waste classification with multi-body linkage

Before the trial implementation of waste separation, in order to achieve the recycling of resources, there is also a market mechanism that does not scale. However, the current trial of waste separation is mostly government-led, with large investments and small returns, and poor initiative of the public to put out waste. Therefore, our team believes that after the trial implementation of garbage

classification, a market mechanism should be formed with the linkage of multiple entities such as putters, waste recycling enterprises and organizers.

The unique conditions of strong environmental awareness, huge amount of domestic garbage, high recyclable rate and regular work and rest in colleges and universities become the innate advantages to promote the garbage sorting reform. Therefore, we innovatively take colleges and universities as the pilot, use the Internet as the technical means, use standardized garbage classification as the basis, explore an integrated operation platform benefiting schools, students, merchants and recycling enterprises, form a market-based mechanism for resource recycling and reuse, and fully mobilize the initiative and enthusiasm of all parties involved in garbage classification [5].

3.2. Realize the unity of economic and social benefits of waste separation

Economic benefits are the prerequisite to ensure the operation of the market-based mechanism of waste separation. And social benefits are the continuous driving force to promote waste separation. The project specifically targets colleges and universities to carry out waste recycling and centralize waste disposal and reuse after correct classification, with the following social benefits.

1) Waste separation, which can realize the reduction of campus waste and promote green development.

2) Recyclability and reuse of garbage, which promotes resource recycling and accelerates the development of circular economy.

3) Separate garbage collection, which can optimize the campus environment and promote the construction of a beautiful campus.

4) A clean and beautiful campus environment, which can maintain the safety and stability of the campus.

5) Students can exchange their accumulated points for medals or prizes at the end of the semester, and it can also be combined with the assessment of student behavior, the construction of civilized dormitories and civilized campuses. The mechanism can also raise the awareness of all teachers and students in colleges and universities to separate and recycle garbage, cultivate the habit of garbage classification, and better achieve the management and cultivation of students.

3.3. Combine the standardization of waste separation with the Internet and smart devices, easy to operate and promote

As the technology continues to mature, this project uses intelligent equipment that automatically weighs and accumulates points, based on standardized garbage classification, uses the Internet to enter personal information, and students put out garbage and scan the code to fill in the information to obtain points to exchange for currency and items, using a point incentive system for garbage classification, which is highly acceptable to students, simple to introduce and process, and highly operable [6].

3.4. Form a complete interest chain and drive the development of related industries

Garbage classification requires the joint efforts of multiple parties and the participation of multiple industries. Once the garbage classification in colleges and universities is implemented, it will be a huge industrial chain that can lead to the development of garbage collection online workers, garbage classification app, small program development, intelligent garbage cans, garbage recycling, garbage disposal and other industries, promote the transformation and upgrading of the traditional garbage recycling industry, drive the development of related industries, provide some jobs and solve part of the employment problem [7-8].

4. Implementation process and results of "Internet+standardized" market-oriented waste separation operation method

At the initial stage of the project, we first establish contact with the school and establish a cooperative relationship with the school's pro to layer, then purchase the corresponding equipment, place garbage cans at various buildings of the school at fixed points, and do the data statistics.

After the initial establishment of the market mechanism of garbage classification, the bidding enterprise completes the market operation of garbage classification. In terms of propaganda, waste classification articles and video clips are continuously pushed through public numbers to popularize classification knowledge and related requirements; mobilization can also be carried out in the whole school through activities such as lectures by school leaders in general meetings, thematic class meetings, thematic party day activities, and promotion by volunteers in classes and dormitories; activities such as garbage classification knowledge tours and knowledge competitions can also be carried out in the later stage of the garbage classification process to continuously improve the environmental awareness of teachers and students and In addition, we can also carry out activities such as garbage sorting knowledge tours and knowledge competitions in the later stage of the waste sorting process, so as to continuously improve the environmental awareness and sense of responsibility of teachers and students [9-10].

According to the functions of different scenes, different facilities and equipment for garbage classification and collection should be set up. According to the requirement of "four divisions", sorting and collecting are matters that need to be completed within the university, while sorting and transportation and treatment need the assistance of relevant professional units. It is difficult to manage different garbage with different transportation units. Therefore, by introducing social capital, all the garbage collected by Green Bubble can be disposed to a certain waste recycling enterprise. This enterprise can come at noon, afternoon and evening at three fixed points to pull away the garbage collected by the campus classification and send them to different waste disposal centers for garbage disposal. In the living area, where there are many types and large quantities of garbage, two buildings share one set of intelligent equipment, and a total of 5 sets of intelligent equipment are purchased, each with 4 types of garbage cans; in the dining area, one set of intelligent equipment is purchased for each floor, and a total of 4 sets of intelligent equipment are purchased, each with 3 types of garbage cans (food waste, recyclable, others); in the teaching area and the main road, a total of 3 sets of intelligent equipment are purchased, each with 2 types of garbage cans (recyclable, other). The profit model of "3+1" is adopted, including the price difference between garbage sale and purchase, merchant rebate or cash deduction, school or government subsidy, and other enterprise advertisement. Among them, the price difference between garbage sales and purchases is the main benefit, and the other three benefits are supplementary. The price difference between the purchase and sale of garbage. Taking paper shells as an example, the cost of purchasing students is 1 yuan/kg, and the revenue from selling to waste recycling enterprises is 1.5 yuan/kg. Businesses rebate or withdrawals deduct 5%. For example, students put 1 kg of paper shell garbage, can go to the supermarket in exchange for 1 yuan of goods, the company and merchants at 0.95-yuan settlement, the company gets 5% of turnover. Meanwhile the school or government subsidizes. Garbage classification has greater social benefits, and after the market mechanism is piloted, it can greatly save the cost of cleaning staff and garbage disposal. Therefore, the school or government can subsidize the company's operation with a portion of the cost savings.

In the fact and operation of the garbage sorting program, advertisements of other businesses can be printed on the garbage cans as a way to obtain investment, ensure maximum revenue, and make full use of resources.

After the implementation and observation of the waste separation market system in each pilot, the data obtained by the office will be analyzed and the implementation plan will be improved. After the initial program can be implemented to the major universities to promote the program to expand the scope of business.

In the initial stage of the project, we used questionnaires to understand the daily habits of college students and the amount of recyclable waste generated.

4.1. Questionnaire age group

In the process of this questionnaire, we interviewed 168 college students of different grades for the survey in order to avoid the disparity of living habits caused by the age gap. The following figure 2 is a chart of the proportion of the surveyed age groups.

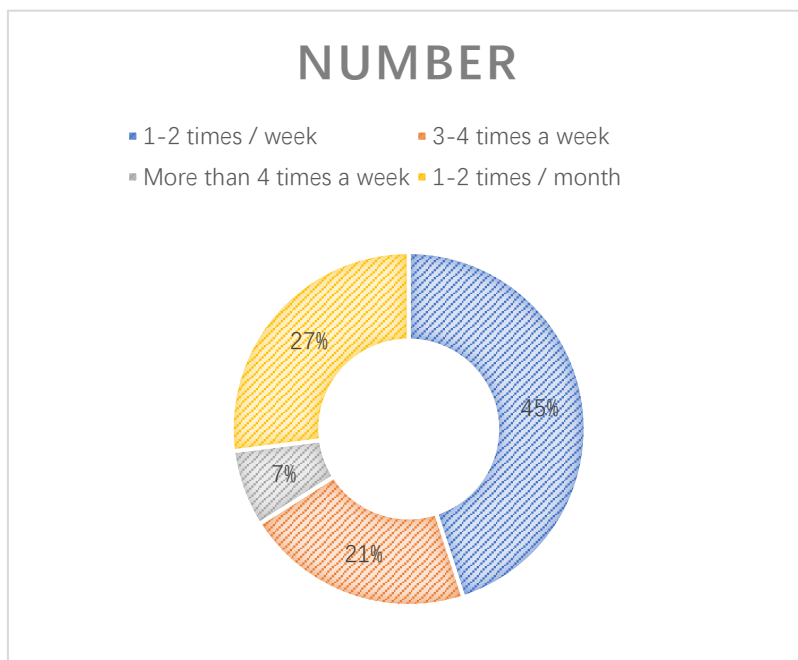


Figure 2. Age group proportion chart

Considering that freshmen are still not familiar with university life and most of the seniors are out on internship, so the reference value is small, we mainly conducted a questionnaire survey for sophomores and juniors.

4.2. Daily online shopping frequency

In order to investigate the daily waste caused by online shopping, we conducted a survey on the daily online shopping frequency of college students, and the survey data is shown in the following figure 3.

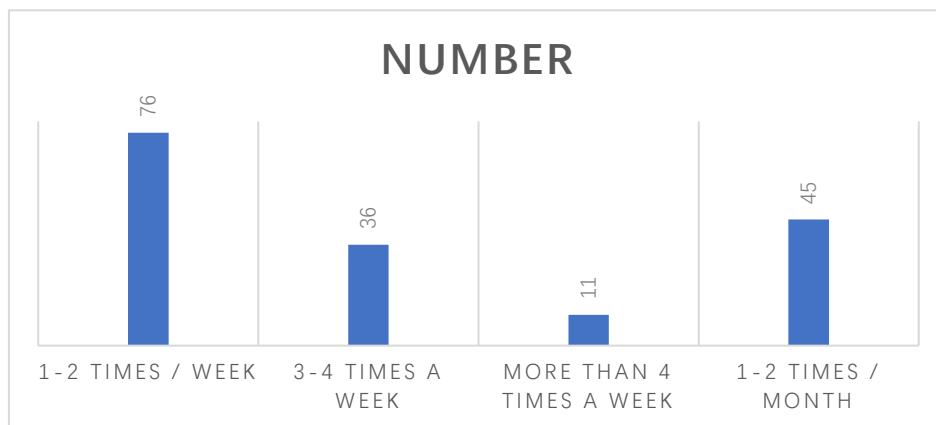


Figure 3. Daily online shopping frequency chart

According to the survey, most students daily shopping frequency in 1-2/week each time and 3-4 times a week, during the online shopping, will inevitably produce courier packaging boxes and other subsidiary waste.

4.3. Garbage sorting method

In order to make college students better sort and recycle garbage, we surveyed the types of garbage sorting preferred by college students in the early stage, and the survey data is shown in the following figure 4.

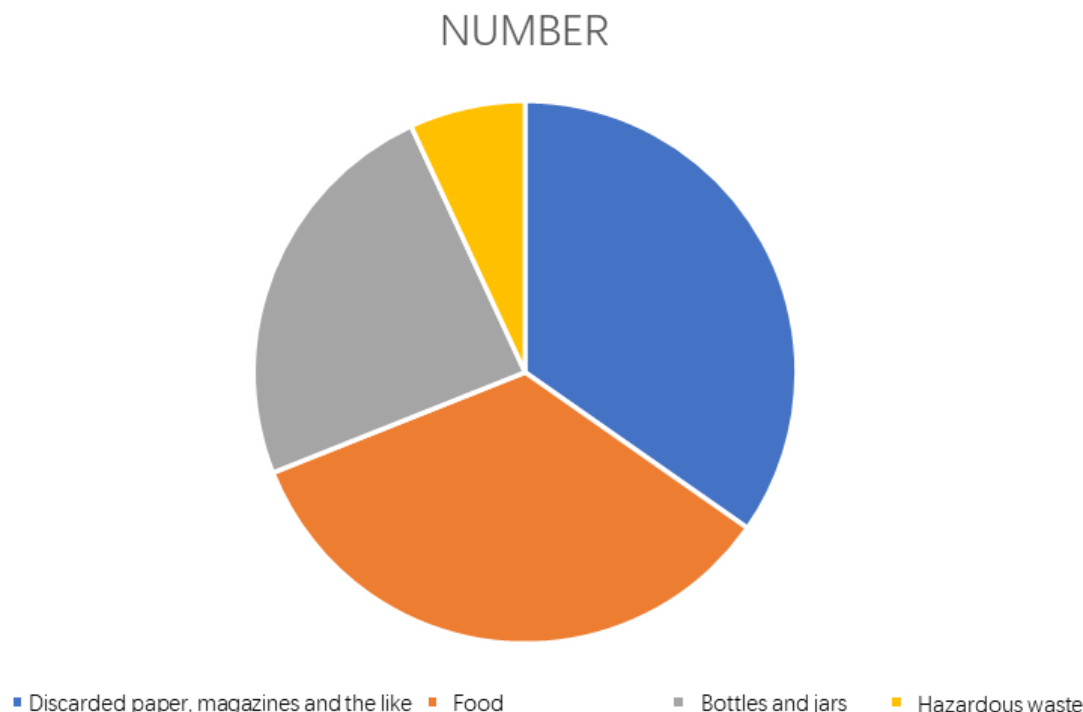


Figure 4. Preference ratio of garbage sorting methods

Through the survey, we can see that most students tend to classify their garbage into recyclable and non-recyclable garbage, so we will also adopt the classification of recyclable and non-recyclable garbage in our later work.

4.4. Types of garbage in daily life of college students

In order to carry out the garbage disposal work in the later stage, it is necessary to know the main types of garbage produced by college students in their daily life firstly, so we conducted a survey and research on the types of garbage produced by college students in their daily life, and the findings are as follows:

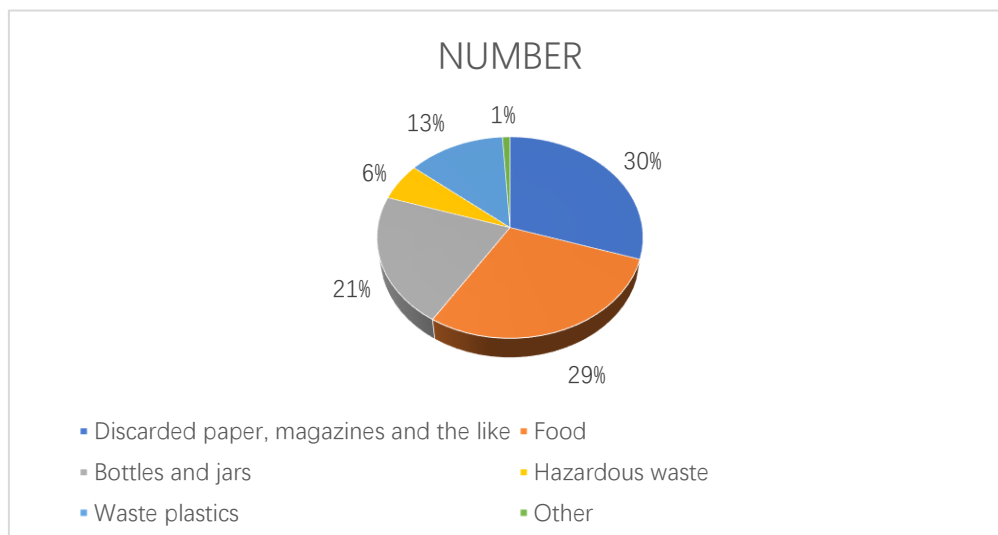


Figure 5. Map of main waste types

From the Figure 5, we can see that the main types of waste generated by college students are waste paper, food and bottles and cans, and the later recycling work can focus on the accumulation of waste.

5. Conclusion

With the progress and development of today's society and the increasing level of material consumption, China's garbage production is also growing significantly, and environmental hazards are becoming increasingly prominent and gradually becoming a constraint to social development. For example, Shandong province produces a total of about 100 million tons of domestic waste, the average daily production of about 75,000 tons, 15 days to fill a Daming Lake, and the annual growth of about 7%. If not solved, the "garbage siege" phenomenon may be close at hand. The classification of urban and rural domestic waste and waste treatment work is urgent. The lack of waste classification in the early stage will bring chaos and waste of resources in the later stage of treatment.

Through data collection and market research, our team found that the current national garbage sorting is a big investment, low income, and poor initiative of residents' garbage sorting, mainly relying on the government's compulsory promotion, and does not form a benign market mechanism. According to the report, Nanchang government has invested 3.601 billion yuan for domestic waste classification publicity and education, construction of classification facilities, and formation of personnel teams.

Therefore, in order to respond to the call of society and raise the awareness of environmental protection among college students, our team set up this project, taking colleges and universities as the pilot, aiming to form an integrated platform of schools, students, businesses and recycling enterprises, mobilizing the initiative and enthusiasm of all parties in waste classification through market mechanisms, and providing a reference for the social domestic waste classification and disposal.

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