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A Comparative Study on the Typical Recycling Mode of Renewable Resources in China Under the Background of Internet

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Abstract
China's renewable resource recycling appeared such as 020, B2C, C2B and other new internet recovery mode. Through comparison of these three typical recovery modes, we found that, 020 mode provides door-to-door recovery service, so it can recycle all kinds of used materials. But the function of the network platform is single and this mode need large enterprises of renewable resources as the offline support; also, the door-to-door recovery methods lack of reasonable cost control mechanism, if these problems can be solved, this mode is suitable for all kinds of renewable resources recycling; B2C mode, with the most advanced reverse logistics tracing system, big date and cloud computing recycling technology, provides various services for all kinds of users, but the intelligent detection technology need a higher requirement of standardization level on renewable resources. Currently, this mode is only suitable for waste electrical and electronic products. With the improvement of intelligent detection technology, this mode has the potential for multi-category of renewable resources recycling; C2B mode, a typical bidding recovery mode, which can stimulate consumer to deliver their waste product actively through the network platform, but the bidding system exists loophole of malicious competition; also, this mode need a higher requirement of standardization level on the renewable resources, so this mode is only suitable for recycling of waste electrical and electronic products in urban areas.

Key words: Internet; Renewable resources; Recycling mode

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INTRODUCTION
In recent years, our renewable resource recycling industry has a great change with the rapid development of Internet technology. Some business recyclers use network platform technology to achieve renewable resources recycling has changed the traditional recycling mode in China. There is no need for consumers to give their all kinds of waste products to fixed place or small individual traders, but through the network platform and mobile app software, easily to make an appointment at home, then there is a professional recovery staff to provide pick-up service and the consumer can obtain a fair and reasonable recovery price. This recovery can not only solve the problem of people's convenience greatly, but also makes the recovery of renewable resources industry more efficient in China, so as to further promote the development of circular economy in our country. Therefore, this paper selects three typical renewable resource recycling mode 020, B2C, C2B to analyze, and make an evaluation on their characteristics and applicable scope.

1. 020 RECYCLING MODE
1.1 Operation of 020 Recycling Mode
020 recovery mode means online to offline, a recovery way that online guide, then offline to achieve the resource recycling. The creator of such a network recycling platform generally constituted by large, professional recycling dismantling enterprises or environmental protection company, they built the network platform

only to achieve information flow guiding role, and it is mainly to solve the problem of asymmetric information between waste owners and business recycler. Namely, the consumer can know the information of recycling price, recycling variety and so on, also the recycler can know when, where and who has renewable resources need to be recycled. In 020 mode, the platform itself is not involved in the recovery of renewable resources directly; the self-employed or dispersed recyclers can join it through the network platform and become a member of the recovery team. When consumer make an appointment on the network, the recycling staff nearby can grab the list through the recycling system and the recycler who has successfully completed the recovery task can obtain recycling commission. For example, "recycling elder brother" is a representative of the 020 recovery mode in China; it is mainly through their own recycling website, WeChat, mobile app platform and recycling hotline to achieve the recovery work. Users only need to make an appointment online or dial fixed recycling telephone number in the network platform, there is a dedicated recycling staff provides door-to-door recovery. And offline "recycling elder brother" is linked to the specialized enterprises of renewable resources; they will deliver the renewable resources to the professional dismantling enterprises through logistics transport directly.

020 is the simplest network recovery method of renewable resources. In this mode, consumer can get convenient appointment, transparent recycling prices, and reduce the transaction risks; environmental protection enterprises can obtain large renewable resources directly and stably; the government has a new way to regulate and control the recycling market; business recyclers can achieve resource sharing through the platform data; recovery platform itself can directly obtain stable customers.

1.2 Characteristic of 020 Recycling Mode

1.2.1 Single Platform Function

In 020 mode, the function of the network platform is particularly limited, it only provides a basic information guiding role for the needs of various customers. Consumer can throw waste by pick-up services through the online booking; the self-employed or dispersed recyclers can be a member of the recovery team through qualification examination on the platform; the recycling enterprise can get information of the consumers and recyclers through the platform, but both sides cannot communicate with each other directly, the communication channels of recovery information are relatively closed. The main purpose of such recycling platform is to achieve efficient recycling of resources through the Internet platform, but does not get a profit by providing a wide range of platform services directly.

1.2.2 Diversity of Recycling Variety

Due to people is placing an order online or by telephone appointment in the 020 recycling mode, and then recovered by a professional staff provide pick-up service, which is conducive to the recovery of some renewable resources with special properties, such as scrap metal, waste glass, scrap tires and other types of renewable resources that cannot be recycled through the network platform directly, so this mode can achieve diversity of recycling variety. In addition, "recycling elder brother", for all household waste, the background of recovery platform will distribute the list to fix personnel to ensure the valuable or worthless can be recycled (Liao, 2015).

1.2.3 Need Professional Renewable Resources Enterprise Support

020 network platform is usually built by some large, specialized environmental companies or dismantling enterprises with strong recovery ability, they just want to use the platform to obtain large quantities of renewable resources rapidly and stably. Therefore, in the area of its model promotion, there must be a large-scale or centralized recycling center as its offline support. For instance, "recycling elder brother", Grammy is the professional environmental protection dismantling and disposal enterprises behind it, and in the nationwide there are nine dismantling centers as its offline entity guarantee, which include Tianjin, Wuhan, Lankao, Shenzhen, Fengcheng, Jingmen, Yangzhou, Xiantao, Taixing.

1.2.4 Higher Recovery Costs

For instance, "recycling elder brother", in the 020 recovery mode, recycling is completed by an online or telephone appointment, door-to-door service, it is difficult to avoid consumer who have less quantity or low recovery value renewable resources, by this way, the cost of labor is higher for a single recycling and there is no mature mechanism to solve this kind of problem, but "recycling elder brother" company require the recovery team must provide pick-up service. At present, the recycling enterprise usually through the form of subsidies to encourage recovery staff to provide door-to-door service, such a practice is bound to increase the cost of recycling enterprises.

2. B2C RECYCLING MODE

2.1 Operation of B2C Recycling Mode

B2C recovery mode means business to customer, a mode of business provides services for all kinds of customers. In the mode, with the advanced research and development technology, the creator of this recovery mode use their own network platform to provide information or equipment services for individuals, recycling enterprises, dismantling company, waste products buyers and other all types of customers. The difference between 020 and B2C is whether the platform itself is directly involved in the recovery work and gets profit by providing services through the network platform, so does the B2C. On the one hand, B2C network platform undertakes the function

of information disclosure and trust transaction, on the other hand, the platform utilizes its intelligent recycling terminal, automated sorting equipment, reverse logistics traceability system, full video surveillance and intelligent recovery technology to finish the recycling work. For example, "taolv net" is a representative of the B2C recovery mode in China, who is the first platform focusing on the recycling of discarded mobile phones services in China's renewable resources industry. With the advantage of its own platform, for one thing, it provide mobile phone recycling and valuation services to individual consumers; for another thing, the online recycler can bid and purchase the product who has offered. "taolv" platform here acts as a principal trading intermediary. In addition, "taolv net" has its own technical advantages, for the products they have recovered, they deliver the worthless mobile phones to professional dismantling enterprises directly, but sell the valuable models in the platform of second-hand (Zhang, 2015). For the whole recycling industry, in B2C mode, the platform use their own intelligent recovery technology to provide conditions for the realization of resource recovery and dismantling information management, also, it can achieve whole process supervision of the renewable resources recycling from the front control to the end dismantling.

The success of B2C mode is that it gives full play to the advantage of the Internet platform. The combination of Internet and Internet of things open up the upstream and downstream chain of the renewable resources industry, forming a safe and standard recovery system, which include resource integration, perfect network, unified standard, advanced technology, comprehensive information and other special services as the core competitiveness of the system.

2.2 Characteristic of B2C Recycling Mode

2.2.1 Advanced Intelligent Recovery Technology

On the one hand, B2C recovery mode, network platform acts as a role of providing public services of renewable resources recovery information, which makes the platform itself bear more information push, entrust trading, online evaluation and quotation, market analysis, dismantling services, technical training and other data resources. The huge information processing work requires platform management technology can meet the daily needs; on the other hand, in B2Crecovery mode, it need to achieve offline logistics recycling and whole process supervision, which in turn requires the use of Internet and the Internet of things technology and unique renewable resources information management technology, also, it need cloud computing and big data to support the development of the system. In addition, in order to meet the multiple demand of customer, it still needs to construct and research technical systems independently, such as reverse logistics traceability system, automatic sorting equipment and so on. Therefore, B2C recovery technology is the most advanced and intelligent.

2.2.2 Diversification of Platform Services

For providing service, B2C recovery mode is the most diversified recycling mode, it service object covers the entire recovery area of one specific variety of renewable resources. With the principle of 4R (recycle, reuse, remanufacturing, reduction), it provide optimal services for all stakeholders in the development process of the upstream and downstream industry chain of a variety of renewable resource recycling, which include a lot of links, from the most simple dismantling and utilization to focus on recycling technology research and recycling advisory services, to the establishment and maintenance of information system, all of these operation and transaction need to be realized in the network platform. So, its services category is extreme diversity.

3. C2B RECYCLING MODE

3.1 Operation of C2B Recycling Mode

C2B recovery mode means customer to business, a recovery mode that is initiated by the consumer to the business recyclers. It is separated from the B2C mode. Consumer can be a platform user by registered, then to achieve free online assessment or deliver their waste through the platform; business recycler can join the platform by qualification examination, and then obtain customer resources; platform itself acts as an intermediary. Namely, consumer submit the renewable resources to the network platform, then the online recyclers can bid for the product, who give the highest price may obtain the object. Therefore, C2B recovery mode is also called auction recovery mode. For example, "love recycling" is the representative of the C2B recovery mode in China, users only need to input the electronic products that need to be recovered in its recovery website, the system will automatically sent the information to various types of recyclers or recycling companies who entered this site. At the same time, the system will collect the recovery price and give the highest price information back to the user. After the client's consent, they can choose door-to-door service, express or nearest store recovery. For all recycled products, "love recycling" need to carry out quality inspection, rating and according to the different outcome of rating and evaluation, the products will be taken by different processing methods. Low value products will be sent to professional dismantling enterprises for environmental degradation directly; middle value products will be delivered to the recyclers through the auction system for further processing; and high value products will be sold through their second-hand platform after professional processing (Zhao, 2015).

Auction recovery is also reflected in the way of B2C mode, but there is a clear difference between them. The recovery on B2C platform is business recycler quote directly, but the price is based on a transaction price

index; however, the auction recovery in C2B mode is a competition of all types of recyclers according to the market. They bid for the products by experience and there is no limit, anyone who provides the highest price will get the renewable resources.

3.2 Characteristic of C2B Recycling Mode

3.2.1 Transaction Risk

As C2B is a typical auction recovery mode, for one thing, there is no reasonable standard of transaction price index as a normative guidance for the network platform, but according to the recyclers' experiences to the market, which may lead to vicious competition situation; for another thing, the recovery platform need to evaluate and select the recovered products, they face a risk of consumer cancel the order actively. Therefore, whether it is for the business recyclers or platform itself, there is a transaction risk in the auction system.

3.2.2 Higher Recovery Costs

In C2B mode, the platform recycler provides door-to door service and express recovery, they can control their recovery cost reasonably by a certain criteria, but based on the principle of free trade, the recyclers still cannot avoid the situation of consumer cancel the order that they had offered on the platform occurred, then the platform recycler must bear the door-to-door recovery cost of labor and delivery cost; In addition, C2B platform need to inspect and evaluate all the recovered products through their own professional system, then according to the different rating to carry out different operation, which recovery cost is higher than deliver the renewable resources to recycling enterprises directly.

4. COMPREHENSIVE EVALUATION OF THESE THREE MODES

4.1 Evaluation of 020 Mode

020 recovery mode, the network platform is a guide for the renewable resources recovery work, it helps the business recyclers to obtain renewable resources fast and efficiently, also the scattered recycling staff can be reorganized on the platform, so as to realize the normative and standard recovery work. The door-to-door recovery services can save construction costs compared with establish a recycling station or a recycling center in the community. Otherwise, the recovery method is more convenient, effective and humanized, and it is possible to achieve universal generalization for all kinds of renewable resources. However, this recovery mode stills exist some problems. First of all, the recycler cannot avoid the situation that consumer offer low value and less quantity waste products, but the business recycler stimulate the recycling staff provide pick-up service by way of subsidies, which may increase the recovery cost in the long run; secondly, 020 platform is the most basic recycling mode of network platform, there are many loopholes on the platform due to its simple feathers, so its recovery method is single; thirdly, 020 recovery platform need the professional or large environmental companies or dismantling companies as its offline support, so, it is really difficult for small business to provide recovery service by this way; in addition, in the mode, most of the practitioners enter the company by the way of franchising, the personnel quality of the recovery team is uneven, it is more difficult to supervise the behavior of recycling staff offline.

Therefore, 020 recovery mode is more suitable for universal generalization of various renewable resources recovery of area with large and professional recycling and dismantling enterprises as the offline support. Also, it needs to improve the recycling information and transparent system on the platform to strengthen supervision on the recycling staff offline and construct a door-to-door recovery standard mechanism to reduce the recovery cost as soon as possible.

4.2 Evaluation of B2C Mode

In the B2C recovery mode, business recycler can use their strong technical capabilities to provide a wide range of services for all types of customers through the network platform, which can effectively meet the needs of different groups; otherwise, the recycler's advanced technology researching ability has become the powerful guarantee for the integration of resources and supervision of recycling process. Consumers can obtain transparent and reasonable recovery price on the platform, recyclers and dismantling enterprises can get large renewable resources through the platform, government may have a new way to supervise the industry of renewable resource. However, it is difficult for general recycling enterprises to build such a platform due to their weakness in unique recovery, information and supervision system, they cannot achieve the specific function of this platform. Also, the various services and extensive service object make the recovery and management costs are relatively high. The B2C recovery mode has a strict requirement for standardization of renewable resources, so this type of recovery mode is not suitable for some renewable resources with special nature, such as scrap metal, waste plastics, waste paper and other types of waste products that need to be measured and weighed by manual work.

At present, "taolv net" platform, the representative of B2C recovery mode only provides express recovery services, but no other kinds of door-to-door recovery and the nearest recycling outlets services, recycling is relatively simple. However, "taolv net" platform can achieve optimal services for waste mobile phones recovery, which demonstrate the B2C recovery mode is more suitable for the recycling of waste electrical and electronic products, because the specifications and models

of such products are relative uniform, and all kinds of intelligent recovery equipment have a strong adaptability for them, which is especially convenient and accurate to detect and evaluate such products. But with the development of the intelligent detection equipment, B2C recovery mode has a potential for all kinds of renewable resources for recovery.

4.3 Evaluation of C2B Mode

The birth of the bidding system has become a typical feature of C2B recovery mode, which can effectively stimulate the consumer to choose this recovery way. At the same time, door-to-door and express recovery methods are really convenient for the person who has no time or inconvenient to deliver their waste products to the fixed recycling centers. However, the specific recovery methods have many problems. First of all, the nearest store recovery way is more suitable for promotion in the urban areas, but not suitable for the promotion in the region of low population concentration; second, door-to-door and express recovery method still cannot avoid failed transaction, but there is no preventive mechanism, which may increase the recovery costs; third, there is no perfect transaction price mechanism to guide and prevent the business recyclers' behavior on the platform, which may lead to malicious competition; forth, since the auction recovery is the typical characteristic of C2B mode, the competitive bidding have a certain request for the renewable resources varieties, after all, for waste metal, waste paper, waste plastics and other kinds of renewable resources with special feathers, they have no normative and permanent nature, the recyclers cannot easily and directly get the quality and property information of the waste product only through the network platform.

Therefore, under the current technology conditions, C2B recovery mode is only suitable for the promotion of renewable resources with normative and unified feathers in big cities, such as waste electrical and electronic products. And the platform needs to build and update the transaction price index, so it can prevent unfair competition and malicious bidding behaviors. Also, the creator of the platform should improve the quality of the business recycler who settled on the platform through the strict qualification review. Thus, the recycling enterprises can guarantee the recovery efficiency.

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