Computer Fraud and Security
ISSN (online): 1873-7056

Research on the Sustainable Development Model of Green Sharing Economy Based on Big Data Security

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Abstract. As an important product of the Internet era, the essence of green sharing economy is to rely on Internet technology. In particular, big data technology will re-use idle social resources and create new market value. However, with the increasing application of sharing economy in the field of green industry, the problems of data security, circulation, sharing and privacy protection gradually appear. Big data technology has become the biggest bottleneck for the further development of sharing economy. Blockchain technology is a new Internet architecture composed of various technologies and communication protocols. Through its encryption sharing, distributed ledger and other characteristics, it provides new methods and ideas for data circulation and sharing, which complement big data technology. Therefore, the integration of blockchain technology and big data technology can subvert the traditional business model of sharing economy. This can innovate the mode and development of traditional green industry, and provide new opportunities for the development of green sharing economy.

Keywords: Green Sharing Economy, Big Data, Blockchain, Sustainable Development.

AIMS AND BACKGROUND

In recent years, the market scale of China's sharing economy has continued to expand. According to the data from the National Information Centre, since 2016, the transaction volume of China's sharing economy market has increased continuously at an average annual rate of more than 40% (Refs 1 and 2). In the next three years, China's sharing economy is still expected to maintain an average annual growth rate of more than 30%, and there is still great potential in the future[3]. But not all links in the sharing economy are environmentally friendly. "Sharing" is a new thing, and in reality there are some unsatisfactory phenomena in the sharing economic activities[4,5]. There are some problems in the concept of consumers, the management of enterprises and even the supervision of the government. The ecological benefits of the sharing economy have not been brought into full play. The discussion of sharing economy promoting green development in academic circles is relatively insufficient, and the role of sharing economy in promoting green development is not fully played in practice. This requires us to carefully analyse from the combination of theory and practice, and then provide countermeasures to solve the problems.

EXPERIMENTAL

WEAK CONSUMER CONCEPT AND QUALITY

The popularity of any new thing has its internal reasons. For consumers, the most attractive thing is to meet their own needs and interests. To a large extent, the development and growth of shared bicycles can be attributed to the fact that it solves the pain point problem of users in the last kilometer. The survey clearly shows that users are guided by their own interests and pay attention to solving the pain point of their last kilometer in the consumption process of using shared bicycles. 36% of the respondents chose the option of "actively stop" when investigating "the treatment methods they will take when they see the uncivilized behaviour in the use of shared bicycles"[6]; 59% of the respondents chose "know it's wrong, but won't stop it", accounting for more than half of the total[7]. Of course, the remaining 5% held an "indifferent" attitude[8]. This still shows that many people pay more attention to themselves and are not willing to spend their time taking proactive actions to prevent and correct the bad behaviours of peer groups in the process of sharing bicycles.

It is understandable to pay attention to their own needs. Sharing bicycles can solve people's short-distance travel problems, which are indeed the convenience brought by the sharing economy to users. The value of avoiding traffic congestion exists objectively, but the public's enthusiasm for the sharing economy is excessively based on their own needs and guided by their own interests. However, they do not pay enough attention to the value of sharing economy in the ecological environment and turn a blind eye to some problems, which have become unfavourable factors in the development of sharing economy and will eventually affect the sustainable development of sharing economy.

In the activities of sharing economy, some consumer groups ignore the rules, want only damage and unreasonable recycling of shared products. The morality and quality of these users need to be improved. These improper behaviours hinder the realisation of the ecological value of sharing economy and become a stumbling block to the development of sharing economy. Take the shared travel industry as an example. According to the official survey data of moBay bicycles, the loss rate of moBay's shared bicycles has reached 10% after four months of operation. Bicycles are damaged in a variety of ways. Some users maliciously alter the QR code attached to the back of the bicycle for their own personal interests, which makes others unable to use. Some users damage the smart lock of the bicycle after unlocking, lock their own lock, and even ride it home as their own personal belongings[9,10]. Input indicators are divided into resource consumption and environmental pollution (Table 1).

Table 1. DEA model input and output index selection

Indicator category	Index description	Index system	
Investment	Resource consumption	capital	Total investment in fixed assets
		science and technology	Local budget of medical technology expenditure
		labour force	Average number of employees on the job
	Environmental pollution	waste water	Industrial wastewater discharge
		waste gas	Industrial sulphur dioxide emissions
		smoke	Industrial smoke emission
Produce	Economic output	GDP Per capita GDP	

Any sharing economic behaviour of users is constrained by relevant systems, and there are corresponding use regulations for sharing economic products. However, since the operation of shared bicycles, the problems of illegal parking, random parking and other violations of use regulations have always existed. Social order has become chaotic due to the disorderly parking and placing of users in the process of using shared bicycles and the deviation from relevant regulations in other shared activities. In the activities of users participating in the sharing economy, improving the quality of the main body is a prerequisite for realizing the ecological value of the sharing economy.

THERE ARE LOOPHOLES IN THE OPERATION AND MANAGEMENT OF SHARING ECONOMY

In order to make the supervision of sharing economic activities proceed smoothly, the operation of sharing economy objectively requires users to register their real names. The networking of sharing economy platform determines that a large number of personal information will be exposed to the network environment, which has a high risk of confidentiality. A large amount of personal information is stored in various bundled accounts. The sharing platform can access it in real time according to needs, and the user's personal privacy is threatened. Real name registration needs to collect a large amount of personal information, including user identity, contact number, payment account and so on. The possible credit and data security problems in the operation of sharing economy increase the risks of enterprises and users, making some users distrust the sharing economy itself.

In the questionnaire, we investigated the factors that affect the frequency of users' sharing of bicycles. 7% of respondents expressed distrust of sharing bicycles, and 13% of users believed that there might be some information and data security problems in the registration code of sharing the real name system of bicycles. The information technology of Internet and big data is the cornerstone of the development of sharing economy, but data and information security have become the trouble of the development of sharing economy. The lack of credit system and imperfect credit mechanism of sharing economy is an important problem at present. In the consumption mode of sharing bicycles, the asymmetry and opacity between user information and platform information may lead to prominent moral and legal risks. Investors and demand platforms should not only value the profit prospects of various data platforms, but also have the courage to assume their own responsibility.

RELEVANT GOVERNMENT DEPARTMENTS FAILED TO FULFILL THEIR RESPONSIBILITIES

With the continuous development of the sharing economy and the further expansion of the outer edge of the sharing economy, many industries and specific enterprises have gradually exposed the problem of lack of access threshold. The sharing economy industry lacks external access system and internal unified and clear industry regulations. The relevant industry access standards formulated by the government according to the characteristics of each industry are not deep enough. It is still an arduous project to standardise and restrict the corresponding sharing behaviour, formulate implementation standards by categories together with the competent departments of enterprises and industry associations, and create more industry standards for the sharing platform to standardize the behaviour. The consequences of the lack of industry access standards are more serious. For users, many sharing activities and behaviours they participate in are at risk. Spatial and temporal changes of urban ecological efficiency are shown in Table 2.

Table 2. Spatial and temporal changes of urban ecological efficiency

Year	2015 (w)	2016	2017	2018	2019	2020	2021	Avg.
City size	<50	1	1	0.891	0.877	0.925	0.999	1
	50 — 100	0.864	0.887	0.757	0.817	0.825	0.816	0.909
	100 — 500	0.681	0.722	0.661	0.632	0.661	0.632	0.615
	500 — 1000	0.722	0.75	0.7	0.636	0.697	0.687	0.656
	>1000	0.743	0.743	0.707	0.644	0.657	0.741	0.713
Area	Eastern Region	0.753	0.749	0.745	0.684	0.704	0.698	0.675
	Central region	0.683	0.686	0.64	0.606	0.642	0.611	0.609
	Western Region	0.649	0.811	0.631	0.621	0.672	0.671	0.638
Administrative level	municipality directly under the Central Government	0.756	0.753	0.767	0.744	0.753	0.76	0.764
	Provincial capitals and sub provincial cities	0.796	0.82	0.799	0.749	0.789	0.737	0.705
	Prefecture level city	0.699	0.734	0.672	0.633	0.666	0.647	0.632
Whole country	0.704	0.738	0.68	0.641	0.673	0.659	0.642	0.677

The business model of sharing economy has covered many fields. In just a few years, the sharing of technology, products and services has been increasing, which is reflected in all aspects of life. However, generally speaking, the understanding of all sectors of society on sharing economy is still relatively limited. Compared with the development of the sharing economy industry, the formulation and promulgation of laws and regulations lag behind, which form a pair of contradictions. For some problems in the sharing economic activities, the existing laws and regulations are not perfect and not enough to support the healthy and sustainable development of the sharing economy. Many problems in the industry lack legal solutions or are in the gray area of legal supervision, which affects the development of sharing economy.

STRENGTHEN GREEN ECOLOGICAL EDUCATION FOR ALL MEMBERS OF SOCIETY

In addition to the publicity and universal education on the sharing economy, all members of society should also receive green production and green consumption education. Green production education is mainly aimed at relevant personnel of enterprises. First of all, enterprises should establish the awareness of green production. Production enterprises should take the initiative to shoulder social responsibility and strengthen the cultivation of personnel quality through on-the-job training, lifelong education and other mechanisms, so as to strengthen

green production and product shaping. Secondly, we should carry out green consumption education through the media and other channels, which requires the society to guide the public. Green consumption education should be oriented to all members of society, through education on the seriousness of environmental problems and the necessity of green consumption values. It can make consumers pay more attention to ecological and environmental problems, and strengthen green consumption education will help people develop an emotional attitude of saving resources and energy, moderate frugality and protecting the ecological environment, and reduce their own extravagance and waste and other unreasonable consumption behaviours. Green consumption is a correct consumption concept. Strengthening the public's green concept and green thinking, allowing consumers to advocate green consumption and reflect their actions in their daily behaviour can have a positive impact on the ecology. The education and guidance of green consumption will help to realize the ecological value of sharing economy.

IMPROVE THE GREEN MANAGEMENT OF ENTERPRISES ON THE PLATFORM OF SHARING ECONOMY

In essence, sharing economy is a green and ecological economy, so its products should first be environmentally friendly and have ecological value. Of course, in addition to the final ecological products, sharing economy enterprises should ensure that ecological and environmental protection runs through the whole industrial chain. Based on the relevant industrial chain of sharing economy, the provision of ecological products should mainly include the green ecology during research and development, production and processing, transportation and storage and consumption. When producing related products, green energy and technologies such as solar energy technology, wind power generation and hydropower generation should be given priority. These technologies use clean energy, which is the basic content and key point to realize green production. After production and processing, the products need to be transported downstream. The use of green packaging and the improvement of pollution control technology can reduce the pressure on the environment. The transportation and storage processes connect the production and market, in which the green improvement of storage, circulation, processing and transportation can be carried out. Environmental friendly means of transportation can be adopted to avoid the loss and cost increase of products in storage and transportation as much as possible. As for the sales end and the end of the industrial chain, advocating green and sustainable consumption and timely recycling and reuse products can enhance the ecological value of the whole industrial chain.

Sharing economy enterprises should change some backward product production concepts, not blindly pursue the maximization of scale benefits, but can be based on the long-term, combine the provision of green products, guiding green development and meeting consumer needs, and put them in a prominent position of enterprise management. In addition, enterprises can also establish relevant research centres with the government and consumers to do a good job in the production of green and ecological products. While understanding the needs of users, enterprises can create more environmentally friendly products and promote the recycling and utilization of original products. Sharing economy enterprises can better serve the economy and society only by providing more green and ecological products and improving their competitiveness.

CREATE A GOOD SOCIAL ECOLOGY OF GOVERNMENT POLICY GUIDANCE AND EFFECTIVE SUPERVISION

As the saying goes, "there is no place without rules", the development of sharing economy is also inseparable from legal norms. The development of sharing economy without legal restriction is likely to be chaotic and disorderly in the end. Due to the imperfect laws and regulations related to the sharing economy and the wanton growth of many bad behaviours, the improvement of laws and government supervision are of great urgency and significance for the prominent problems of some industries under the background of the sharing economy. In today's environment, the government needs to enhance its credibility and do a good job in top-level design, and properly improve laws and regulations according to relevant issues. For problems such as loopholes in third-party platforms and lack of protection of consumers' rights and interests, relevant laws and regulations should also be implemented and improved to clarify the responsibilities of all parties. Formulate relevant policies and regulations within a reasonable scope, promote and encourage the development of emerging business forms of the sharing economy, improve more mature rules and regulations and explore new business models on the basis of mass entrepreneurship and innovation, so as to make the development of the sharing

economy more ecological and healthy.

In the long run, the ecological sustainable development of sharing economy depends more on the standardized, legalised and long-term legal mechanism. Improving the laws and regulations related to green management requires long-term practice, implementation, exploration and improvement. China can modify and improve the corresponding green regulations according to its own national conditions and the local development characteristics and problem characteristics of the sharing economy, combined with some experiences and lessons of other countries.

CONCLUSIONS

As a spontaneous sharing economy in the market economy, it has injected fresh blood into the development of the original economy and played an important role in ecological protection. With the continuous emphasis on the harmonious coexistence between man and nature, the sharing economy is in a tuyere of the construction of ecological civilization. Affirming the ecological value of the sharing economy makes this economic form have huge development space and good development prospects. As ordinary people, we must take more care to protect the business form of the sharing economy and make the sharing economy give full play to its ecological value. When we explore everyone's strength and participate in the construction of the sharing economy, we will continue to penetrate and integrate into more Internet fields. The form of sharing economy will develop more reasonably and healthily, become an economic form that will continue to flourish in the future, change behaviour and lifestyle together with various new business forms, and lead the development of the times.

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