

The Path of Sustainable Development of Shared Packaging in the Context of “Internet+”

Mingyue Xiang

Hunan Modern Logistics College, Changsha, Hunan, China

Keywords: Internet +; Shared packaging; Sustainable development

Abstract: With the rapid development of Internet technology, all industries have received new development opportunities, and the express industry is no exception. While express delivery brings convenience to people's lives, its packaging also causes certain environmental pollution. Therefore, in order to address the environmental pollution and resource waste caused by the current increase in express packaging waste, this article, based on the Internet platform, uses the business model of the sharing economy to study the path of sustainable development of shared packaging.

1. Introduction

The express industry runs through the entire process of express transportation, including product sorting, transportation methods, stacking and unloading, and plays a key role in information dissemination, commodity protection, and sales promotion. Express packaging not only brings convenience to people, but also wastes many resources and causes serious pollution to the social environment. With the rapid development of the Internet industry, the sharing economy has become a commercial outlet, with an increasing number of people participating in the sharing economy, a significant increase in the revenue of the sharing economy platform, and a continuous expansion of the fields involved in the sharing economy. With the improvement of people's environmental awareness and the improvement of the country's green economy, economic and environmental friendly shared express packaging has emerged as the times require.

2. The Concept and Value of Shared Packaging

“Sharing” mainly refers to sharing the right to use or know an item or information with other owners, not belonging to individuals. It has three characteristics: commonality, non private ownership, and universality. Based on the characteristics of sharing, the shared packaging proposed in this article is mainly a kind of non fixed general packaging aimed at certain specific industries or specific types of packaging, which can be reused between different entities or the same entity in different transportation processes. It belongs to a new type of express packaging. Due to its recyclable, controllable, and adaptable characteristics, this packaging form can replace the use of disposable express packaging in certain industries in logistics, reduce the use cost required for a single turnaround, and reduce the environmental pressure caused by packaging. Specifically, due to the particularity of its mode, shared packaging presents the following three aspects of value.

Firstly, shared packaging provides multiple recyclable functions through sharing mechanism features, and greatly reduces the environmental costs, logistics costs, and recovery costs of individual packaging for single use, in order to achieve packaging reduction and green design effects.

Secondly, shared packaging is the key to the rational and optimal allocation of packaging industry chain and social resources. The controlled design of shared packaging can achieve lean management of packaging in the storage, transportation, sales, and recycling processes, effectively improving the utility ratio of the packaging industry chain.

Thirdly, shared packaging can resist and suppress the mechanical and biological changes of packaged items by carrying intelligent hardware modules. This enhances the security of the flow of goods and information, and expands the intelligent function of shared packaging in logistics

systems.

3. The Path of Sustainable Development of Shared Packaging in the Context of “Internet+”

3.1. Promoting Green Packaging Consumption

Green packaging refers to non environmental hazards, and packaging production requires the entire life cycle of packaging materials, production processes, transportation processes, actual consumption processes, and product disposal processes. Therefore, green packaging uses non-toxic, harmless, and recyclable materials. Green consumption refers to “consumers considering the impact of their own behavior on the environment when purchasing, using, or disposing of products, to minimize negative impacts and maximize long-term benefits as much as possible”. The corresponding green packaging consumption refers to the subjective use of environmentally friendly bags and reusable packaging boxes by users. Green packaging consumption is conducive to the healthy development of the social environment. For the use of shared packaging, it is necessary to promote green packaging consumption behavior among all users in society, which involves consumer self-control trade-offs. From the perspective of sharing, the factors that affect users’ consumption of green packaging include consumer factors, external factors, and material factors.

Consumer factors mainly focus on the impact of consumer values, beliefs, standards, attitudes, and other factors on consumers’ green consumption. By initiating environmental value, consumers can increase their attention to green packaging consumption information, and then choose friendly packaging, increase consumers’ self responsibility, enhance consumers’ preference for green packaging, and enhance the perceived effectiveness of reliable information on green packaging.

External factors need to implement sustainable development for consumers based on environmental factors, material factors, etc. Environmental factors mainly include economic incentives, supporting facilities, and social norms. Among them, social norms are to promote and educate consumers to generate green packaging consumption behavior, and to restrict and regulate consumers’ social consumption behavior, making consumers passively accept the consumption methods of social needs, achieving green consumption, guiding consumers to use shared packaging boxes, and minimizing the use of disposable packaging boxes.

The material factor should consider the mainstream design direction of low carbon materials, pressure resistant, non fragile, recyclable plastics and paper, with achieving efficient utilization and recycling of packaging resources as the core. On the basis of recycling, full consideration should be given to the issue of material recyclability, namely, new materials that do not produce harmful substances during use and can be recycled for reproduction. Such as plastic materials, PP (polypropylene), PE (polyethylene), PET (polyester) and other recyclable packaging materials. In particular, PP material is a plastic polymer made from monomers of propylene, which has exceptional resistance to acids, bases, and chemical solvents. Due to their high strength mechanical properties and good wear-resistant processing performance, they are designed as foldable and removable shared packaging containers processed from PP materials, which are stable, compressive, not easily damaged, and can be recycled for use. They should be customized for recycling packaging rental management. At the same time, corrugated paper can also be used as a shared packaging material, due to its low cost, easy processing, pressure resistance, light weight, and other advantages. At the same time, most corrugated paper can be recycled and reused, making production, processing, and use more convenient. Although it is slightly more expensive than TPU materials, it is currently one of the more suitable materials for sharing packaging boxes. In addition, TPU (Thermoplastic polymers) has been recognized as a new type of polymer material with green environmental protection and excellent performance. It is a thermoplastic polyurethane elastomer rubber with high strength, high toughness, wear resistance, and other characteristics. It is light in weight and easy to process, and can be used as a filling and packaging material. In view of this, external conditions such as durable materials, light weight, and easy operation have a positive impact on sustainable consumption behavior. Its essence is to carry out sustainable consumption behavior at a cost that meets consumers’ psychological expectations, which can effectively reduce

perceived barriers to green consumption.

3.2. Implementing Multi-functional Packaging Modeling

Shared packaging should consider multiple recycling uses of shared packaging resources when meeting logistics requirements. According to the two-dimensional model of “structural utility -recycling” of packaging resources in the shared economy, the shared packaging structure is classified and designed based on the characteristics and attributes of goods. By focusing on refining the packaging operation essentials of the interior, shared packaging can achieve sustainable design standards that are quantifiable, measurable, foldable, and universal, meeting market requirements and consumer needs.

Shared structure is the primary consideration for packaging. The shape and structure of the packaging box should be convenient for storage, transportation, recycling, etc., taking into account the quality, volume, loading and unloading of the packaging container during storage and transportation, as well as the stacking method and display effect during the flow process, such as the unified display space of the product logo, reasonable size, and compressed space occupancy. For express delivery enterprises using express packaging boxes, appropriate models of packaging boxes should be selected based on the maximum quality and maximum comprehensive internal dimensions of the contents. In addition to meeting the requirements of the *Green Packaging Code for Mail*, the structural design of the goods in the packaging box should also consider the durability and damage resistance of the materials, and should provide a variety of packaging modeling structures, forms, colors, etc. for users to choose from. For the combination and stacking of multiple packages, the modeling structures such as foldable (Figure 1), standardized, wall snap type (Figure 2), and modular units should be adopted.



Figure 1 Schematic diagram of axial center type shear hinge folding structure

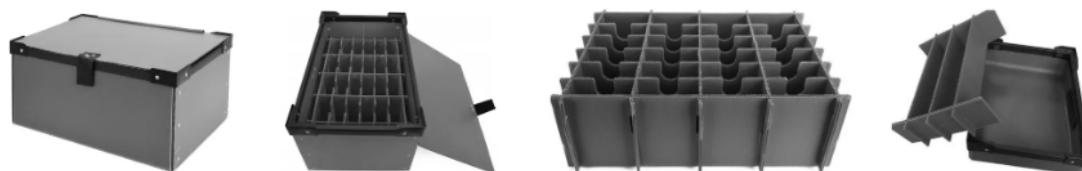


Figure 2 Schematic diagram of the structure of the inner partition box with snap fasteners

3.3. Constructing a Sustainable Development Model for Shared Packaging

The sharing platform of the sustainable development operation mode of shared packaging has built a new operation mode of recyclable packaging and a recycling system integrating commodities and logistics, creating a multifunctional packaging resource and a sharing economy operation mode. Through the operating mechanism of the sharing platform, express companies, as well as third-party institutions and users, can better promote the logistics model, strengthen the green packaging supply chain, and achieve the sharing and environmental protection of shared express packaging in accordance with the principle of joint construction, sharing, and mutual benefit.

Users can use the Internet platform to call the nearest shared packaging station and provide logistics companies with packaging usage based on their own needs. They can use the shared information constructed by the Internet to fully display the shared packaging on the data platform in visual forms such as structure, graphics, and images, allowing users to accurately select their own target needs.

By establishing an effective management system for shared packaging boxes, real-time

monitoring of the recycling, detection, classification, and remanufacturing of packaging boxes during the logistics process ensures the accuracy of information on the recycling boxes, enabling express companies to grasp relevant information on shared packaging in real time. At the same time, an intelligent positioning system has achieved efficient packaging supply chain management. Information is generally shared through application types such as RFID radio frequency cards, AR augmented reality technology, and two-dimensional code scanning. The sustainable development shared packaging business operation mode is to provide users with an effective packaging leasing mode through the development of a mobile app leasing mode and the use of an Internet platform to promote the sustainable development of packaging sharing forms. In the sustainable development operation model of shared packaging, data technology platforms, manufacturers, distributors, express transportation companies, and shared resource recovery centers form a related shared packaging supply chain. Shared packaging manufacturers visually display various packaging box structures and models through mobile applications, and design reasonable recycling routes to detect damaged packaging from various user recycling stations. The manufacturer sorts the packaging box type of goods according to the contract signed with the distributor, reasonably locates and distributes the shared packaging to the distributor based on the packaging production cost, and then the distributor distributes the shared express packaging to the express delivery company. The logistics company sends packaged goods to the user according to the specific situation of the delivery of the goods. After receiving the goods, the user puts the used packaging boxes into the automatic shared recycling box within the specified time, and scans the QR code of the mobile phone to send the information about the old packaging boxes being put into the recycling box in real time, so that the logistics personnel can confirm the recycling in a timely manner. Consumers can bind APPs on their mobile phones and scan QR codes to select appropriate packaging resources and close shared packaging recycling bins in the packaging resource management system, provide accurate information and payment methods in the system, implement incentive policies for users with good credit (depending on the degree of damage, return time, etc.), and implement incentive standards based on such situations, such as priority shipping, coupons, and rebates. The shared express packaging system is implemented through a data sharing platform, requiring real-time inspection such as detection and classification of recycled shared packaging, enabling merchants and users to timely grasp accurate information during reuse, avoiding inconvenience to users during the reuse process, and thereby affecting the recurrence of green consumer behavior among users.

4. Conclusion

“Shared packaging” is a design concept of sustainable development. It is a recyclable sharing platform and sharing mechanism established based on the principles of joint construction, sharing, mutual benefit, and win-win results. While expanding the application scope of recyclable packaging, it also realizes the principle of sharing economy. Therefore, based on the Internet platform and under the concept of sustainable development, focusing on innovation in shared packaging structures and materials is conducive to packaging standardization, reduction, recycling, and achieving green environmental protection. At the same time, making full use of the sustainable development operation model and corresponding APP programs can reduce costs, obtain economic benefits, achieve packaging resource sharing, maintain social and ecological development, promote green consumer behavior, and further improve the structure of the shared packaging recycling system and multi-functional boxes, which is the only way to achieve sustainable development. The research in this article helps to improve people's understanding of shared packaging, and has certain important reference value for theoretical research and practical development of shared packaging under the data sharing platform.

References

[1] Chen Long, Li Ying, Liu Wei. Research on Logistics Shared Packaging Design Based on Large Database [J] *Packaging Engineering*, 2020, 41 (10): 6.

[2] Li Ying, Chen Long. On the Sustainable Development of Shared Packaging Design [J] Hunan Packaging, 2018 (5): 4.