



The Development of the Shared Portable Chargers Industry Under the Sharing Economy and Its Problems and Solutions

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Abstract. Based on the background of the sharing economy, the shared portable chargers industry has developed rapidly in China in recent years. This paper summarizes the development trend of the industry and objectively analyzes the advantages and disadvantages of the current development of the shared portable chargers industry. Through the analysis of problems and the proposal of solutions, a feasible path is proposed for the shared power bank enterprises to maximize their existing advantages and correctly face the challenges. This paper summarizes the factors of industry competition into four aspects: resources, products, operations, and scale, and applies them to the competitive strategy analysis of leading companies in the market. Under the analysis of the industry competition of enterprises, this paper proposes that the current shared portable chargers industry has problems such as unstable demand at the grassroots level, single profit model, potential safety hazards, and mobile phone technology impact. And then, this paper puts forward corresponding solutions, including push-pull combination and targeted marketing strategy, broadening profit channels, improving safety performance, and increasing technology investment. Through the analysis and solution of problems, this paper focuses on the opportunities and challenges of the shared portable chargers industry in the future.

Keywords: Shared portable chargers · Industry analysis · Problems · Suggestions for solutions

1 Introduction

1.1 Background

In the context of the successful development of the sharing economy, shared portable chargers are favored by many companies as an emerging industry. Nowadays, consumers rely more and more on portable electronic products such as mobile phones or tablet computers. The power bank is an extension product under this demand, which effectively solves the defect of the short battery life of such products. Moreover, compared with the mature shared bicycles in the market, the investment, operation, and maintenance costs of shared portable chargers are low, and the capital recovery rate of investors is high.

Therefore, the shared portable chargers market has attracted the attention of investors and manufacturers. Since it first met with consumers in 2014, it has developed rapidly.

In the fierce market competition environment, shared portable chargers enterprises have also generated or faced many problems while developing the market and making profits through various competitive factors. From the perspective of industry development, the key to the sustainable and healthy development of the industry is for enterprises to promptly identify problems, actively face challenges, and effectively solve them based on giving full play to their existing advantages.

1.2 Related Research

The logic behind the current rapid development of the sharing economy is already in the existing literature. Qiu et al. took shared travel and shared housing as examples, deeply analyzed the business models of Uber and Airbnb, and proposed that the sharing economy platform integrates goods and services through Internet technology and directly matches the supply and demand sides of assets. They concluded that the sharing economy platform can break the traditional buying and selling relationship and further reduce the market's inefficiency [1]. Cohen and Kietzmann analyzed why some sharing platform companies have achieved great success and why more sharing platform companies have failed from the perspective of business model profitability. Through detailed qualitative comparative analysis, they concluded that the differences in the value concept and ideology of the managers of sharing platform companies mainly affect the differences in the companies' pricing strategies, financing models, and crowd financing methods [2]. Bond illustrates that the emergence of the sharing economy brings both opportunities and challenges through the case analysis and data interpretation of the traditional taxi industry and the shared taxi company Uber. Bond pointed out that, on the one hand, the sharing economy provides a new way to create wealth by unlocking previously underutilized resources. On the other hand, the sharing economy also challenges the existing municipal regulatory structure to a certain extent [3].

Regarding the sharing economy helping the development of the shared portable chargers industry, there are also studies showing optimistic prospects. Zhou and Wang analyzed the development status of the shared portable chargers industry and said that under the leadership of the sharing economy, the current capital investment in the shared portable chargers industry is hot, the sharing model is transparent, and the consumer demand is bullish, making it a new investment outlet [4].

In terms of industry analysis of shared portable chargers in China, Yang and Li reviewed the development history of China's shared portable chargers industry. They pointed out that some companies came from behind and developed rapidly, and some companies stopped operating and withdrew from the market. Yang and Li conducted a comprehensive analysis of the market competition situation of China's shared portable chargers industry from five aspects: operation mode, market share, financing situation, profit model, and primary competition strategy, and summarized the current competition pattern of China's shared portable chargers industry in turmoil [5].

Furthermore, some studies have pointed out the challenges encountered in developing the shared portable chargers industry. Lin et al. pointed out that due to the influence

of various factors such as information asymmetry and industry competition, the development of the sharing economy is limited to a certain extent [6]. Li et al. summarized that the borrowing and returning process is cumbersome and inconvenient, the rental cost is high (most portable chargers need to pay a deposit of 100 to 200 yuan), and the upgrade of mobile phone battery technology has a negative impact on the shared portable chargers industry [7]. Zhang counted the consumption of shared portable chargers through the “Consumer Behavior Questionnaire of Shared Portable Chargers Service Platform” and analyzed the characteristics of consumers. The survey results show that, on the one hand, most people have a thorough understanding of the shared portable chargers platform, but they are skeptical and wait-and-see about its use and generally choose to bring their portable chargers; on the other hand, most people have concerns about the deposit and the safety of the shared portable chargers service platform [8].

At present, some scholars are optimistic about the development of the industry. Hou made a detailed analysis of the business model of the Monster shared portable chargers enterprise using the business canvas model theory proposed by Alexander Osterwalder in 2005. Through specific analysis, Hou affirmed Monster’s leading position in the shared portable chargers industry and was optimistic about the development of the sharing economy under the 5G wave [9]. Hu took the shared portable chargers enterprise Jiedian as an example, analyzed its operation status from the perspective of competitive means and concluded that Jiedian has guiding and reference significance for the shared portable chargers industry [10].

1.3 Objective

Based on the background of the sharing economy, this paper summarizes the development trend of the shared portable chargers industry and the competitive advantages of leading companies in China. On the other hand, this paper expounds on the easily overlooked but essential defects exposed in the overall favorable situation of the industry. Moreover, this paper gives corresponding solutions and suggestions for the problems raised, and finally, it briefly looks forward to the development prospects of the shared portable chargers industry.

The full text is divided into six parts. The first part is the introduction. The second part summarizes the shared portable chargers industry’s development history and status. It analyzes the four leading enterprises under the current competition pattern based on the four competitive factors of resources, products, operations, and scale. The third part proposes the current problems faced by the industry. The fourth part proposes targeted solutions to the problems raised. Furthermore, the last part is the conclusion of this paper.

2 Industry Analysis

2.1 Shared Portable Chargers Market

2.1.1 Development History of the Shared Portable Chargers Industry

In China, since the concept of shared portable chargers came into being in 2015, the shared portable chargers industry has attracted the attention of many companies. The industry has gone through several development periods, as detailed below. At present, the development of the industry tends to be stable (Table 1).

Table 1. Development history of the shared portable chargers industry

Time	Period	Characteristics
2015.11–2017.02	Budding period	The operation strategy of the shared portable chargers industry has been initially explored.
2017.03–2017.09	Outbreak period	The industry has completed at least 30 financing activities during this period.
2017.09–2018.09	Cooling off period	Several shared portable chargers companies have ceased operations or declared bankruptcy and liquidation.
2018.09–2019.12	Key development period	Leading players have announced that they have achieved profitability.
2020.01–2021.12	Reshuffle period	Under the influence of the epidemic of COVID-19, the competition gap between enterprises in the industry has gradually widened.
2022.01–now	Stability period	The mergers and acquisitions of leading players have been completed, and the industry market structure has stabilized.

2.1.2 Development Status of the Shared Portable Chargers Industry

The current shared portable chargers market is seriously polarized. The high concentration of resources makes the market concentration of head players high. Moreover, the market clearance of tail players accelerates. At the same time, capital, marketing channel, and scale barriers make it difficult for new players to enter the shared portable chargers industry.

2.2 Shared Portable Chargers Market

The core competitiveness of the shared portable chargers comes down to four aspects: resources, products, operations, and scale. Resources are the foundation of everything, and they determine the sustainability of cash flow, the speed of scale expansion, and the ability to survive turbulent times. Products and operations are the roles of the right-hand man, and the key is to be precise and meticulous. From the choice of partners to the placement of cabinets, countless details about products and operations are worthy of scrutiny. As time goes by and the battle line lengthens, the roles of products and operations will become more and more apparent. The first three ultimately determine the scale of the enterprises. At the same time, the increase in scale can also attract more capital, retain more merchants, and invest more in research and development. Therefore, in the later stage, the competition is a competition of comprehensive strength, including resources, products, operations, and scale.

2.3 The Competitive Landscape of Shared Portable Chargers and the Competitive Strategies of Typical Enterprises

2.3.1 Competitive Landscape

In terms of user scale, equipment laying breadth and primary income, “Three Dian and One Monster” are in the leading position in the industry. “Three Dian and One Monster” includes Laidian Technology, Xiaodian Technology, Jiedian Technology, and Energy Monster. Jiedian Technology has merged with Soudian Charging to form Zhumang Technology. Calculated in rental income, the industry CR4 in 2020 was as high as 83%. The market share data of the four leading companies in 2020 are shown in Fig. 1.

2.3.2 Competitive Strategies of Typical Enterprises

According to the competition mentioned above pattern of “Three Dian and One Monster”, the Table 2 explicitly describes the competitive strategies of these four leading companies in the three major competitive elements of resources, products, and operations.

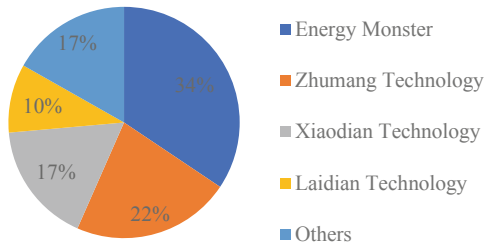


Fig. 1. The market share of the four leading companies in 2020

Table 2. Competitive strategies of typical enterprises

	Resources	Products	Operations
Energy Monster	Energy Monster has the support of many well-known investment institutions such as Xiaomi Technology, Softbank Asia Venture Capital, Shunwei Capital, Qingliu Capital, Hillhouse Capital, and Lanchi Venture Capital.	Energy Monster relies on upstream supply chains such as Zimi to ensure product quality and has independently developed a set of underlying Internet of Things (IoT) communication protocols to reduce failure rates.	Energy Monster relies on the customer base of the existing portable chargers business and builds the charging liquor brand “Kai Huan”. Through the cross-border liquor business, Energy Monster has the opportunity to achieve new products class extension.

(continued)

Table 2. (continued)

	Resources	Products	Operations
Zhumang Technology	The direct business model of Jiedian has substantial competitive advantages in first-tier and second-tier cities. Soudian's agency model has the advantages of low cost, abundant resources, and rapid expansion in third-tier and below cities. After the merger, Zhumang Technology's dual-mode division of labor and resource integration in different cities will help improve its penetration and coverage.	Soudian's business focused on upstream manufacturing and machine sales, while Jiedian focused more on the operation of downstream merchants. After the merger of the two companies, the shortcomings of the two companies in the industry chain will be made up, and the advantages of the entire industry chain will be brought into play.	
Xiaodian Technology	Xiaodian Technology has increased its loyalty to the Xiaodian Technology brand from the merchant side and the user side through the direct sales team and the operation of the super membership system.	Xiaodian Technology adopts multiple protection circuits technology of intelligent lithium battery charging management and intelligent microcomputer control, which have passed multiple certifications.	Based on the high stickiness of merchants and users, Xiaodian Technology has gradually established a comprehensive online and offline brand exposure model for merchants, empowering merchants with customized marketing services.
Laidian Technology	Since 2021, due to industry competition and environmental factors, the business of sharing portable chargers with Laidian Technology has gradually shrunk.	Laidian Technology is the company with the most significant number of patents in the industry, with 173 valid patents.	Reducing operating costs and maintaining the existing business have become essential development strategies of Laidian Technology.

3 Problems

3.1 Consumers' Willingness to use Remains to be Developed

First, it is challenging to cultivate user consumption habits. Although the shared portable chargers industry has developed rapidly in just two or three years, it is still in its infancy. There is a gap in the market, and user needs have not been stimulated to the greatest extent. Judging from the current market development situation, most mobile phone users cannot think of shared portable chargers in times when their mobile phones are out of power. In addition, most users who use the shared portable chargers do not need to charge for a long time, and the short-term charging of about half an hour is mostly free time,

so the rental cost is meager. Changing this usage habit of users is a challenge for shared portable chargers companies.

Second, users do not use shared portable chargers frequently. Consumers who will choose to use shared portable chargers must meet the following conditions: first, they go out; second, the mobile phone battery is exhausted, and there is no charger and charging cable; third, they do not want to buy a portable charger; fourth, there are shared portable chargers around. Users who meet the above conditions simultaneously will initiate the demand for shared portable chargers. Therefore, users' use of shared portable chargers is not in rigid demand. Moreover, it is not easy to generate long-term needs. Therefore, the shared portable chargers will be idle.

3.2 Single Profit Model

The shared portable chargers industry mainly has four profit methods: rental fees, advertising income, deposits, and the sale of peripheral products. In 2019, the proportion of various types of revenue from shared portable chargers was as Fig. 2.

Currently, only rental income is a relatively mature sector of the industry. However, because consumers' demand for shared portable chargers is uncertain or contingent, it is difficult to form a fixed demand, making it difficult for enterprises to generate stable income from charging on time. Such low rental costs drop in the bucket for shared portable chargers companies with high capital investment.

In terms of advertising revenue, although it is the profit focus of most shared portable chargers companies, it is currently in the early stage of industry development. Many advertisers are also waiting to see it. Simultaneously, the income potential is uncertain because the advertisements that shared portable chargers can carry and disseminate are limited. In terms of deposit, the retention rate of the shared power bank for the deposit is not high. Furthermore, the deposit income will be further reduced with the deepening of the deposit-free system. For the sale of peripheral products, most users of shared portable chargers are only to solve temporary urgent needs and have no intention to buy data cables or other related products. Therefore, the income from the sale of charging cables is unstable.

In summary, it can be seen that the profit model of China's shared portable chargers industry is relatively simple.

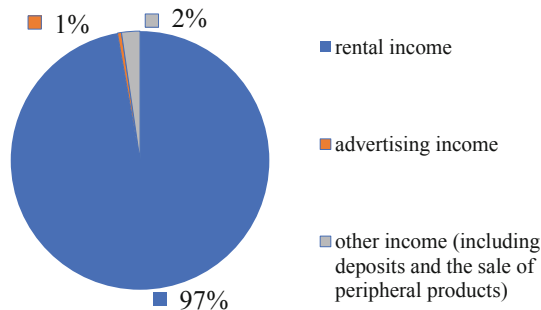


Fig. 2. Proportion of various types of revenue from shared portable chargers in 2019

3.3 Security Risks

On the one hand, there are user personal information security issues. Public charging cabinets may be hacked, leading to information theft. Also, users need to use WeChat or Ali-pay to scan codes when renting. Because both are bound to users' personal information, there is a risk of leakage.

On the other hand, the shared portable chargers have safety problems. The quality of the shared portable chargers on the market today is difficult to guarantee. After a long period of use, safety problems may occur. There are also reports of some cases of spontaneous combustion or explosion of shared portable chargers.

3.4 The Enhancement of Mobile Phone Technology Brings Challenges to the Shared Portable Chargers Industry

At present, the fast charging technology of mobile phones has dramatically improved, and the battery capacity and battery life of the whole machine are also increasing. Many domestic mobile phone manufacturers, led by Huawei and Xiaomi, are constantly accelerating the research and development of fast charging technology to increase the capacity of batteries. Details released by the US Patent and Trademark Office show that Apple's patent application includes the content of iPhones carrying larger-capacity batteries. Since the shared portable chargers and the mobile phones' batteries are substitutes for each other, the advancement of the mobile phones' fast charging technology and the enhancement of battery life will pose a threat to the shared portable chargers.

4 Suggestions for Solutions

4.1 Push-Pull Combination and Targeted Marketing Strategy

The competition for shared portable chargers is currently more focused on occupying dominant positions and merchant channels, that is, more on the "push strategy", which increases market recognition by encouraging channel merchants. However, since the shared portable chargers are emerging, customers' demand has not been fully developed. Therefore, how to better guide customer needs and develop potential customers, that is, the "pull strategy", should also become the focus of the shared portable chargers enterprises. In general, enterprises should consider the combination of push and pull in formulating marketing strategies.

At the same time, shared portable chargers companies should first analyze the main user characteristics and locations with a high frequency of use and then use more accurate marketing methods to attract customers to use shared portable chargers. Extensive publicity does help to increase the popularity of the industry, but for specific companies, analyzing users' needs and characterizing users' characteristics should be the primary job of marketing.

4.2 Broaden Profit Channels

Enterprises can use big data to count the distribution of users, formulate profit strategies in a targeted manner, and increase the utilization rate of shared portable chargers per unit time. For example, when borrowing or returning from other places, the applet pushes different information according to the user's location.

At the same time, the shared portable chargers companies can consider increasing advertising revenue. Screen display cabinets can be placed in densely populated stations and airports; small cabinets, power bank bodies, and the rental page of small programs can also be used by businesses to advertise.

4.3 Improve Security Performance

If the shared portable chargers industry wants long-term development, it must improve its safety performance. Enterprises should improve the quality of the portable chargers, carry out regular maintenance and publicize the use and safety performance of the portable chargers to all users. At the same time, enterprises must continuously improve the operating platform, refund the deposit in the shortest time, and avoid the leakage of users' personal information. Only when the enterprises can ensure product quality, reduce security risks, and provide users with a high-quality user experience can they have more user groups.

Besides, the government should also introduce corresponding regulations to regulate the market order, especially for illegal traders who try to steal user information. At the same time, the law enforcement agencies should deal with the traders seriously and increase crackdown on them.

4.4 Increase Investment in Technology

In the future competition, the core competitiveness will become the key to the success or failure of the shared portable chargers industry, and the lack of technology will make more and more companies become out of the game. Shared portable chargers companies should strengthen hardware and software development and technological innovation and think about how to be significantly different from traditional portable chargers companies. At the same time, because of the technological progress of mobile phone manufacturers in terms of fast charging technology and battery life, how to deal with these competitions and keep their enterprises alive and competitive is not only a problem that an enterprise needs to consider but also the entire shared portable chargers industry must consider.

5 Conclusion

Under the current competition pattern formed by China's shared portable chargers industry, this paper analyzes the four major leading companies in terms of resources, products, operations, and scale of the competition. It summarizes the reasons for the rapid development of the shared portable chargers industry in recent years and why leading companies stand out in the fierce market competition. In the analysis of the industry competition of

enterprises, the author found that the current shared portable chargers industry has problems such as unstable demand at the grassroots level, single profit model, potential safety hazards, and mobile phone technology impact. In this regard, the author puts forward corresponding solutions in a targeted manner, including push-pull combination and precision marketing strategies, broadening profit channels, improving safety performance, and increasing technical investment.

In the long run, the development of the shared portable chargers industry has both challenges and opportunities. In the future development process, enterprises must face the problems and make continuous improvements. Simultaneously, the development of 5G and big data has laid a technical foundation for developing the shared portable chargers industry. Based on the advantages of Internet traffic and the accumulation of data resources, the development of the whole scene ecology will gradually become the critical layout direction of the leading manufacturers of shared portable chargers.

Overall, the shared portable charger is a product of the sharing economy. It has its unique advantages and characteristics and its particular problems and defects. Promoting the shared portable chargers requires social support and technological innovation and depends on the development of the overall sharing economy.

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