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Enriching Value of Big Data Cooperative Assets from a Time-Horizon Perspective

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Abstract: Driven by the rise of big data, enterprises urgently need to accurately utilize users' real-time and accumulated information to realize present value and establish long-term advantages, then achieving the sustainable development. Previous works identified value co-created through big data as "big data cooperative assets". However, while the mainstream research on this concept has primarily focused on analyzing its features, formation conditions, and influencing factors, particularly from the perspective of time-horizon value, an equally important area—the formation mechanism—has been neglected. To address this gap, this article constructs a classification framework of big data cooperative assets by combining time-horizon aspects with interaction dominators. It then examines the formation mechanisms of data link and data insight value through multi-case analysis. Overall, this research not only provides new perspectives for enriching the theoretical understanding of big data cooperative assets but also suggests useful practical guidelines for innovative interaction between enterprises and users in the age of data competition. In addition, improving the efficiency of realizing the value of big data cooperative assets helps the enterprise to better cope with external risks, such as market changes and policy adjustments, and maintain sound operations, further contributing to build a harmonious society and promote the construction of an ecological civilization.

Keywords: big data; cooperative assets; interaction; time-horizon value; sustainable development

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1. Introduction

The COVID-19 pandemic in early 2020 exposed many uncertainties in the global economy. The rise of big data technology played a crucial role in reshaping how businesses create value, both instantly and over time. For instance, short-form video content has revolutionized real-time marketing. During its 11th anniversary of 2024, Xiaomi's official flagship store generated 278 million yuan in sales through live broadcasts. Online influencers have also become key players in instant value creation. Influencers like Wei Ya leverage live streams to engage users and drive sales. Big data also unlocks potential value creation. Henkel Home Cleaning, for example, using market trend reports and consumer research, Henkel Household Cleaning recognizes that scents and perfumes is becoming more and more prevalent in the new age of consumers, who want to relax and relieve the stresses of life and bring emotional value through scent. As a result, a cross-border approach has been taken to incorporate high safety-rated fragrances into adhesive products (Data resource: https://www.163.com/dy/article/J7VF9PJV0539E9ND.html accessed on 25 July 2024, and Data resource: https://www.thepaper.cn/newsDetail_forward_29359893 accessed on 15 November 2024). Similarly, influencer Li Ziqi partnered with Ctrip to create unique tourism projects during the Spring Festival, capitalizing on her popular video content and dedicated fanbase. Therefore, effectively harnessing the power of big data

is crucial for the survival and growth of digital enterprises, both now and in the future. Similarly, influencer Li Ziqi partnered with Ctrip to create unique tourism projects during the Spring Festival, capitalizing on her popular video content and dedicated fanbase (Data resource: https://baijiahao.baidu.com/s?id=1815574926825032268&wfr=spider&for=pc accessed on 15 November 2024). Therefore, effectively harnessing the power of big data is crucial for the survival and growth of digital enterprises, both now and in the future.

Exploring the co-creation value theory of big data is conducive to better helping organizations in resource allocation and decision-making [1], improving the quality and efficiency of decision-making and communication [2,3], improving organizational performance [4,5], and promoting the sustainable development. Many scholars work on the value brought by the co-creation driven by big data, identifying the concept of big data cooperative assets [6–8]. Following research mainly discussed the value theory of big data cooperative assets from its features, formation conditions, and influencing factors. For example, ref. [9] discussed that big data cooperation assets refer to the use of big data technology to effectively connect users and enterprises. The asset characteristics, like big data cooperation assets, can bring current or future economic benefits to enterprises as well as they must become partner assets to the other party, as demonstrated by other scholars [6,10,11]. As well, ref. [9] found that big data cooperation assets formation requires the digitization of user participation behavior; thus, user-generated data should have higher accessibility and higher commercial value, so that companies can interact, understand, and analyze user big data in time [12]. User-owned resources such as network assets, persuasion capital, knowledge reserves, and creativity will affect the value of big data cooperative assets [13].

Although a lot of effort is being spent on exploring features, formation conditions, and influencing factors in the formation of big data cooperative assets [14], the efficient and effective discussion on the value formation mechanisms of big data cooperative assets has yet to be developed. This has caused some management theories and phenomena to be poorly explained, and not commensurate with the important role of big data cooperative assets in value co-creation.

To address the identified research gaps and considering the timeliness or durability characteristics of big data cooperative assets, this paper based on the theory of time-horizon value and interaction, this paper proposes a classification framework for big data cooperative assets, and further proposes a mechanism for realizing the value of big data cooperative assets through theoretical discussion and multiple case analyses. This study not only contributes to deepening the theory of the value realization mechanism of big data cooperative assets under the time dimension, but also provides support for real enterprises. These enterprises can then choose different value realization mechanisms according to their own business or data types to efficiently enhance their competitive advantages. It further creates a larger profit margin, provides financial support for enterprises to invest in sustainable development projects (e.g., clean energy, environmental protection technology), and enhances the social image of the enterprise, thus facilitating the achievement of long-term stable development of the enterprise.

The structure of this paper is as follows. A brief review of relevant concepts in interaction dominating under digital technology and the time-horizon value of big data cooperative assets is presented in Section 2. Moreover, the section also presents the research framework of this paper. Section 3 describes the measurement of the research. Especially, Section 3.1 briefly sampling principles and data collection; while Section 3.2 shows data coding and analysis. In the next section, the main idea of the big data cooperative assets value realization mechanisms is described. This paper concludes with a discussion of future research considerations in Section 5.

2. Literature Review

2.1. Interaction Led by Enterprises and Users

Since the concept of value co-creation was put forward, scholars have focused their research on extending this business model to develop the real market. They have also

further studied its determining factors. Furthermore, a set of value co-creation performance evaluation systems has been established to provide reasonable suggestions and optimization strategies for the future development of enterprises [15–17].

With the development of digitalization, the participants in value co-creation (i.e., users and enterprises) have undergone a new model change in the interaction between value creation activities. Judging from the existing literature, research in this field can be roughly divided into the following two aspects: user-led interaction and enterprise-led interaction.

Users can, and often do, occupy a dominant position, and can achieve value creation through the products and services provided by the company in combination with their own available knowledge, skills, and other resources [18]. Research also pointed out that users, as the dominant player in interaction, can create real value [19]. With the development of digital technologies such as big data, users can express higher demand for products and services [20], and with the support of these technologies, actively participate in business processes such as product development and service innovation, realizing the interaction with the enterprise and finally creating value [21,22]. While these documents are based on different theories, they all emphasize the initiative of users when interacting with enterprises.

Companies take the initiative to interact with users to achieve their goals, thus companies take the initiative to shift the focus of their own production and marketing activities to customer consumption activities, consumption practices, consumption experience, and consumption scenarios. It also specifically includes the daily life of customers related to the products or services provided [18,23]. The advent of digitization has led to major changes in the ability of companies to interact with users [7,24]. Research conducted by [25] emphasizes that through the internet, powering information, companies can reduce the degree of information asymmetry in the interaction between users [25]. On this basis, a series of empirical studies conducted by [26] and ref. [27] confirmed that the establishment of a new interactive network between enterprises and users can further promote interaction innovation. These studies all aim to show that under big data technology, the company's active interaction methods have been optimized and elevated to a democratic method [28], thus becoming the direction of digital transformation that adapts to environmental needs [29].

Previous scholars paid attention to the influencing factors in the interactive innovation process between enterprises and users in the digital context, and proposed improvements that enterprises can make [14]. For example, ref. [6] put forward two influencing factors of cooperation ability and cooperation resources between enterprises and users from the perspective of resource and ability management. Enterprises establish a unified enterprise-level interactive innovation big data platform, which innovative resources, services, data, and users are managed in a unified manner, and a unified application development and interactive management operating environment are provided to improve the interactive mode [11].

Overall, the above studies have confirmed that enterprises and users, as distinct interactive entities, can effectively promote value co-creation with the support of digital technologies such as big data. However, these studies all regard value co-creation as a process. ref. [6] and other scholarly works [21,22] have innovatively expanded research in this field and based on this, proposed the definition of big data cooperation assets, which frames value co-creation from the perspective of results and provides a clear definition.

2.2. The Time-Horizon Value of Big Data Cooperative Assets

As mentioned in previous research, the concept of big data cooperative assets is proposed and defined as an asset with current or future economic benefits that can be acquired or controlled by partners through service exchange [6]. If the company and the customer want to achieve value co-creation, they must become the partner assets of the other party [10,11].

As a product of value co-creation, big data cooperative assets have gradually become a research hotspot. Current research on types of big data cooperative assets has been

launched, focusing on their time- horizon value. This research generally identifies two types: immediate/transient values and potential values.

Transient Value: Transient (the same meaning as instant value, real-time value, and in-time value) is usually formed through the further development of in-use information formed by the interaction between the enterprise and the user. The value of this information is fleeting. When used efficiently and accurately, it can directly generate commercial value (such as consumers' actual purchases); when used inefficiently, the opportunity to transform the current value will be lost [30]. Just as [31] pointed out, with the help of big data analysis, companies can effectively discover and respond to customer real-time needs. That agrees with the research developed by [32]. In their research, companies will discover the actual needs of their customers by discovering their current preferences, routines, and even emotional states, etc. in-use information; then they can realize instant value by effectively responding, like providing suitable service to these needs [32]. For example, Netflix has attracted most potential customers by allowing customers to watch desired movies based on analyzing their present feelings; car rental service providers provide rapid customer consumption with the help of an advanced big data platform that can calculate online and offline rental processes data [33,34]. Several scholarly works also discussed the key factors that affect the real-time value of big data cooperative assets. For instance, in the study by [35], the process of interacting with companies was highlighted, as not only do customers need convenience and service quality, but also the type of service and service speed are very important as well.

Overall, the above-mentioned studies have emphasized the instant value of cooperation between users and enterprises—that is, if the value of existing assets cannot be grasped, the enterprise will not be able to obtain profits. Its core is being able to promote consumer in-time purchases through in-time information analysis. Like the problems pointed out by [32], how do companies discover and use this data? Future research still needs to study and explore these paths.

Potential Value: By accumulating, storing, and analyzing the digital traces formed by the interaction between companies and users, there will be new innovations that were not anticipated by the original innovators or consumers. Moreover, these innovations add to these digital products and services. Scholarly works in this direction focus on big data collaboration assets that promote innovation (such as the study by [36]) and use this as a trigger to find meaningful directions for innovation within the company. One of the most important examples is the opportunity to co-create with customers, relying on historical customer data, collecting habits and preferences, etc. [37].

Questions such as: How to analyze and collect historical customer data? What are the aspects of customer data? Many scholars provided corresponding explanations: analyzing customer-generated data displayed in various formats such as video, blog, and social media data [38]; using digital transaction data to enhance business operations [39], such as product optimization and new product development decisions [40,41]. Because companies increasingly rely on information, knowledge, and evidence-based insights obtained from data [42,43], the research significance of big data cooperative assets has become more and more prominent. Ref. [44] also pointed out that with the rapid development of the digital economy, information resources are delivered to users in a more diversified manner, leading to the characteristics of individualized and diversified user needs for products. The traditional business model cannot match the highly variable user needs, so companies can only use customer information to explore new product innovation models to achieve a high degree of matching between generational changes and user needs.

The above-mentioned studies proposed real-time value and potential value dimensions of big data cooperative assets; preliminary research and exploration on influencing factors and their importance have been conducted. However, the real-time and potential value formation paths of big data cooperative assets remain largely unexplored, particularly how enterprises and consumers individually dominate interaction.

2.3. Research Framework

This study aims to explore the mechanism of realizing the time-horizon value of big data cooperative assets in contexts where firms and users dominate the interaction respectively. The exploration of the value realization mechanism can effectively enhance the enterprise's satisfaction of immediate value and the development of potential value. Then will enhance the sustainable economic growth of enterprises and promote the fulfilment of corporate social responsibility. As shown in Figure 1, based on the interaction theory and the theory of big data cooperative assets, this paper proposes a framework for classifying big data cooperative assets and conducts a multi-case analysis based on it.

	Instant Value	**Potential Value**
Enterprise-led interaction with users	**Enterprise value conversion big data cooperation assets (Enterprise precision marketing, etc.)**	**Enterprise value accumulation big data cooperation assets (Enterprise product development, etc.)**
User-led interaction with enterprise	**User value conversion big data cooperation assets (Live streaming by users, etc.)**	**User value accumulation big data cooperation assets (User collaboration and co-creation, etc.)**

Figure 1. The big data cooperative asset value classification framework.

Broadly speaking, big data cooperative assets characterized by real-time value are a type of value conversion that involves two specific types: (1) enterprise-led value conversion, that is, enterprises leading interaction with consumers to realize big data cooperative assets' instant value; and (2) user-led value conversion, that is, consumers leading interaction with the enterprise to realize the immediate value of big data cooperative assets.

Similarly, big data cooperative assets characterized by realizing potential value are mainly regarded as a type of value accumulation, which also involves two specific types: (1) enterprise-led value accumulation, that is, the enterprise leading the interaction with users to realize the big data cooperative asset's potential value; and (2) user-led value accumulation, that is, the user dominating interaction with enterprises to realize the potential value of big data cooperative assets.

3. Research Method

The aim of this study is to explore the mechanisms for realizing the time-horizon value of big data cooperative assets. Value formation mechanisms through subsequent multiple case analyses in the context of beauty services are explored. The following reasons may be applied of this research:

For multiple case studies: First of all, the core of this article is the question of "what" and "why", suitable for case studies [45,46]; secondly, there are relatively few preliminary studies on the theory of big data cooperative assets, such as how interaction between enterprises and consumers is driven by big data, therefore it is suitable to use qualitative research methods for in-depth exploration [47]; and finally, compared to single case studies, multiple case studies more easily help with cross-case comparison to further ensure the external validity and integrity needed to construct a more general theory [45,48].

For cases of the beauty industry: This study selects the beauty industry as the case to explore the value formation mechanism of big data cooperative assets. Primarily, interaction with customers will eventually affect beauty companies' strategic choices [49,50], and even greatly impact the value formation mechanism of big data cooperative assets. Secondly, the domestic beauty market is now facing a considerably turbulent market environment that is causing some companies to engage in online interaction to explore marketing opportunities and develop sustainable capabilities [51]. In addition, the openness and transparency of market prices have made the formerly lucrative profits of the beauty

business now meager, and customers have more choices [52]. Companies need to seize opportunities for innovation and real-time marketing extension to cope with the turbulent market environment.

For criteria of selecting cases: Under the guidance of theoretical sampling criteria, the study elaborated on the following points for selecting cases: (1) selected cases should be service providers from the cosmetics industry; (2) the cases should have developed a comprehensive big data platform to ensure user interaction and big data operation; (3) data availability, quantifiability, as well as verifiability suggested that selected cases should be private enterprises rather than state-holding; and (4) it is important to point out that all the above cases were required to have similar scale, technical proportion, market share, and life cycle stage. Additionally, they were hoped to be providing analogous services or products to avoid unexpected variable influence, and invalidity of cross-case analysis.

For data of case selection: The sample data for collection generally consists of first-hand as well as second-hand sources. The former is regarded as original data collected by the investigator through direct interaction with respondents, usually associated with consumer demands and structure, market competition ability, etc. While second-hand data refers to existing data obtained indirectly by other data users, it has a wider range that is broadly organized into data from inside (i.e., accumulated business operation data, financial statements) and outside (i.e., literature references, materials available on the Internet, statistical yearbooks). In this research: (1) for data collection related to choosing and describing cases, second-hand data with its accessibility, low-cost, and non-time-consuming features can be applied more effectively than first-hand data; (2) for data related to the value accomplishment process of cases, though first-hand data has higher reliability, and persuasiveness, it requires collecting methods like interviews, inquiries, and questionnaires, which necessitate on-site investigation. This has irresistible limitations due to COVID-19. Even if the researcher gets allowance for data collection, the preparation phase will still be a considerable time-consuming process. At the same time, these data are usually associated with consumer demands and structure, and market competition ability with high confidentiality. Thus, collection of second-hand data is necessary; and (3) [53] proposed that more than two types of data should be used to overcome the problem of retrospective deviation to the greatest extent. So that the completed data collection should consist of more than two types of second-hand data.

The thorough process to conduct case research is as follows:

- Browsing information, choosing suitable cases that fit the framework of big data cooperative asset types.
- Through the most representative cooperative assets of chosen cases, gathering and collating data related to their value accomplishment process.
- Performing cross-case comparative analysis to construct a complete theoretical discussion.

3.1. Sampling Principles and Data Collection

Based on typicality and theoretical sampling guidelines, this study selected four (in this case A, B, C, and D) companies that meet the standards from the cosmetic industry service providers for conducting research. The four selected companies are all well-known cosmetic companies with similar market share, etc. and obvious types of big data cooperative asset values.

Company A is S'YOUNG Group. It was established in 2006. In March 2007, its sub-brand UNIFON was the first cosmetic brand to enter Taobao; at the same time, it entered other e-commerce platforms. In 2019, the group clarified the development direction of overseas markets and reached a strategic cooperative agreement with mainstream platforms in Southeast Asia, Lazada, Shopee, etc., and divided the company's business expansion into two major sections: its own brand and agency business. The focus was on brand image building and comprehensively promoting the brand image through the integrated marketing of e-commerce platforms, film and television drama variety films, theme activities, IP, and new media. From 2015 to 2018, the main brand UNIFON won

multiple awards at the Tmall Golden Makeup Award, known as the 'Oscar in the Cosmetic Industry' for four consecutive years, including the annual category award (mask category), the annual brand marketing award, and other important awards.

Company B is the Perfect Diary Group (Guangzhou, China), established in 2017. The soul figure is Huang Jinfeng, who worked at Procter & Gamble before. His expectation for Perfect Diary is to create 'the new L'Oreal and Estée Lauder Group of the Internet' and to create an internationally influential Chinese Beauty Icon. Committed to exploring European and American fashion trends and combining the facial and skin characteristics of the Asian population, they developed a series of high-quality, well-designed, and easy-to-use makeup products for the new generation of women. The marketing of Perfect Diary includes almost all popular marketing channels. Their way of getting traffic is via public and private domain marketing. In terms of social marketing, Perfect Diary cooperates with up to 15,000 community leaders, of which more than 800 community leaders have millions of fans.

Company C is Winona, and its parent company is Betteni Biotech Co., Ltd. (Kunming, China), founded in 2010. It has been developed for 10 years and counting. It is a health industry group integrating research, development, production, and marketing. It has patented extraction technology, isotonic skin-friendly technology, 3S liquid crystal layered technology, and cold extraction technology, NONASORB MS UV isolation system, and other core technologies. As the only medical skin care brand in my country that has undergone clinical testing, Winona has been clinically verified by 54 tertiary hospitals, and its basic scientific research has been recognized at the national level. The one-to-one free skin Questions and Answers activity launched by it has radiated to more than 500 key cities across the country, reached every corner of skin care for Chinese people, and laid a solid foundation for product research and development.

Company D is Florasis, which was unveiled in Hangzhou, China on 8 March 2017. It is a cosmetics brand with the concept of 'Oriental Makeup, thus Makeup by Flowers'. At first, it was just a niche cosmetics brand, and the following year sales reached 43.19 million. By 2019, sales reached 1.13 billion, a 25-fold year-on-year increase, second only to Perfect Diary with a valuation of 1 billion U.S. dollars. Since the beginning of the establishment of the brand, Florasis has attached great importance to the participation of users. In August 2017, Florasis settled in Tmall and opened a brand flagship store. In the same month, it issued the 'Makeup Experience Officer Recruitment Order' for the first time on the brand's official WeChat account, inviting users to participate in the 'internal testing' of 6 products. At present, the Florasis brand WeChat service account still has an entrance for 'recruiting experience officers', and the bottom of the homepage of the Florasis Tmall flagship store and the store membership interface also have publicity and redirects related to 'experience officers'.

Table 1 below shows the big data cooperative asset type of four cases and lists some examples.

The collection and sorting of related materials, such as the case company information and data related to the value formation mechanism, are divided into two parts:

- Outside second-hand materials: Mainly derived from documents officially published by the above four companies, information disclosed by various media on the Internet, and information related to the company, officially published books, and various reports.
- Inside second-hand information: Mainly came from the company's official website, company prospectus, and the company's official Weibo and WeChat accounts.

Table 1. Classifying cooperative assets: a four-case analysis.

Company	Cooperative Assets	Examples
S'YOUNG	Enterprise value conversion big data cooperative assets	Companies make use of Taobao stores using their own Taobao store to conduct questionnaire surveys through micro-surveys, allowing users to choose which new product they like, explain their preferences, and receive personalized recommendations, and collect users' market demand for skin care products. They interact and achieve rapid conversion of potential users. The company pays attention to brand image shaping, through the integrated marketing of e-commerce platform, film and television drama variety show, theme activities, IP (Intellectual Property) and new media, to promote the brand image across multiple channels and directly promote sales. The S'YOUNG real-time transaction graph is updated in real time, and the 'Total UV (Unique Visitor) of Amoy Department Stores of the Day', 'Top 10 Transactions by Province', 'Customer Evaluation' and 'Independent Brand Hot-sale Index' are continuously updated. Based on this, the company actively adjusted its sales strategy and adopted many ways of giving away gifts and combined promotions to achieve breakthroughs in sales data.
Perfect Diary	User value conversion big data cooperative assets	On TikTok, the official account of Perfect Diary has 669,000 followers and its content has garnered 5.794 million likes. The platform can directly link consumers (active and potential) to Taobao and Tmall platforms under the video content, ensuring a rapid membership boost. A celebrity is responsible for creating initial interest, a beauty blogger provides guidance, and then amateur users spontaneously participate by sharing their experiences. The posts about Perfect Diary on Redbook have accumulated more than 290,000 likes and views.
Winona	Enterprise value accumulation big data cooperative assets	Based on the case of consumers acquired by urban sinking penetration, Winona has completed traffic harvesting in the e-commerce channel and conducted product research and development. Winona has been deeply involved in major social media platforms, using the advantages of medical endorsement, and maximizing dermatologist consultations to obtain a large amount of user data for product development.
Florasis	User value accumulation big data cooperative assets	Florasis has established a 'mystery experience officer' mechanism, inviting users to experience Florasis's service processes and products. This initiative focuses on user feedback and aims to improve and realize brand service co-creation in response to user questions. Additionally, Florasis has established a 'cultural communication officer' mechanism, inviting users with relevant professional knowledge to spread Oriental culture with Florasis and realize the co-creation of content.

As Table 2 shows, this research collected over 500 samples of cases, with 146, 122, 139, and 138 in each respective category.

Table 2. Data source and total volume collected.

Data Source	S'YOUNG Group	Perfect Diary	Winona	Florasis	Total
Inside second-hand data	77	59	91	56	283
Outside second-hand data	69	63	48	82	262
Total	146	122	139	138	545

3.2. Data Coding and Analysis

In this study, a multilevel coding method was used (see Table 3), with 3 authors coding simultaneously. To ensure the interpretive validity of the text, the following practice was adopted: the three members analyzed and discussed the results of data coding,

and when one of them put forward a viewpoint, the other members acted as supporters or rebuttals, verifying, and supplementing the proposed viewpoints or questioning the proposed viewpoints, until a consensus was reached. This team-based discussion not only ensures the completeness of the information obtained, but also reduces the one-sidedness of conclusions due to personal bias and subjectivity. During the analysis, if any doubts or contradictions are found, the raw data are confirmed.

Table 3. Data sources and coding schemes.

Data Source	Company A	Company B	Company C	Company D
Inside second-hand data	A1	B1	C1	D1
Outside second-hand data	a1	b1	c1	d1

The data were organized into textual documents and categorized with reference to the established case study methodology, and the categorized documents were reviewed and proofread for coding. Independent coding was carried out using a back-to-back coding approach.

4. Case Studies

The formation logic of big data cooperative assets centers on how to efficiently realize their immediate and potential value. Traditional methods of user conversion and R&D (Research and Development) often rely heavily on continuous investment in marketing expenses and the recruitment of more designers. Similarly, in the current era of big data, companies may resort to blindly investing in technology or personnel. However, the four case companies selected in this article demonstrate that by identifying the specific types of big data cooperative assets they possess, they can leverage corresponding data interactions for value realization. For enterprises, this represents an improvement in strategic direction and decision-making, moving beyond vague guesswork and blind investment strategies.

Furthermore, the case analysis of this article finds that in realizing the real-time value dimension and potential value dimension of big data cooperative assets, the interactive methods led by enterprises and users share some common features. For example, they emphasize the efficiency of data analysis as well as data transmission to realize instant value. They also emphasize the importance of data development and user content mining to realize potential value. The following is a detailed analysis of the four case companies and the value realization mechanism behind them.

4.1. Value Realization Mechanism of Conversion Type (Enterprise Value Conversion Big Data Cooperative Assets)

Regarding the enterprise value conversion of big data cooperative assets, this research mainly uses company A (i.e., S'YOUNG Group) as a case for analysis. S'YOUNG Group has been very successful in actively interacting with users and realizing instant conversion of their value.

The inductive analysis of the case data of S'YOUNG Group found that the realization of its real-time value mainly depends on the company's accurate grasp of customers and efficient service links. In this process, S'YOUNG Group quickly grasps the users who meet the needs and uses its own unique and efficient services and marketing methods to attract users to purchase desired products and obtain immediate benefits. The user data obtained in this process can help it achieve more accurate target user group positioning and process improvement after analysis. Through continuous interaction with users, S'YOUNG continues to exert its advantages in big data, so that its products can be introduced to the market more quickly and be favored by users.

According to S'YOUNG's continuous deepening of user big data application, the real-time value realization of its value-conversion cooperative assets specifically includes three stages: (1) The stage of obtaining group feedback through preliminary positioning

of user groups; (2) The stage of analyzing group feedback and updating needs; and (3) Tapping potential users and finally, carrying out service guidance and realizing the rapid conversion stage.

4.1.1. Strategically Positioning User Groups for Feedback Gathering

S'YOUNG Group not only has its own independent brand, but also acts as an agent for international brands. Both business models rely on an understanding of customer groups. Its own brands include the main brand 'UNIFON' and the differentiated sub-brands 'UniClear', 'Big Drop', 'MIHOO', etc., and agent brands such as Dr. Ci: Labo. Existing research reports show that 111 products of UNIFON occupy 8 sub-categories of beauty, and its users include both men and women. Its facial masks can be said to be [part of] the largest segment of the skin care industry.

At this stage, S'YOUNG Group first promotes service information for its own target groups through a variety of information promotion channels to reach users. Users who receive corporate information and show service interest will browse and search through various platforms and give feedback to enterprises. In terms of targeting their own target groups, the company divides its brands into multiple sub-brands to target different groups of people. UNIFON, UniClear, MIHOO, etc., are well-known skincare brands owned by S'YOUNG. For example, Xiaomou was born in consideration of the individual needs and spending power of young people, and its packaging design is the most adorable and In-Route. The product mainly promotes mask sets with fruit, mineral, and amino acid mud, which are more attractive to their user groups. When initially obtaining the positioning of the target group, UNIFON established a catalog of its own magazines. Through the QR code that is clearly placed on the catalog page, users can directly follow the store on Taobao after scanning. All these attempts are to aggregate fans in the store to refine marketing.

After locating its own customer base, UNIFON focused on casting the net and fishing for big fish and paid special attention to its own brand image shaping, in order to obtain more all-round user feedback. However, to pursue efficient user feedback from different brands, the specific information channels are also different. For example, its sub-brand Xiaoluo Facial Mask tends to adolescent girls, preferring to use it for product promotion in TV dramas, especially sweet pet dramas. They, working with 'OMG!' host Wu Xin and Wang Xiaoya, carried out campus film student recruitment activities in major colleges and universities across the country. Through a combination of online recruitment and offline promotion, it attracted more than one million people to participate and received a lot of user feedback. For the attracted international brands, such as Dr. Ci: Labo, the company classifies its products into head, waist, and tail based on category and price. At the same time, it digs out consumer pain points based on product functions and characteristics and finds the corresponding target consumer groups for marketing.

4.1.2. Analyzing and Updating Group Feedback Needs

On the display on the first floor of the S'YOUNG Building in Science and Technology Park located in the West City of Changsha, the S'YOUNG real-time transaction map is updated in real time and displays 'Total UV of Amoy Department Stores of the Day', 'Top 10 Provincial Transaction Ranking', 'Customer Evaluation', and 'Best Sales of Independent Brand'. Thanks to such a fast data analysis platform, companies can update their demand status in real time. As Mu Xiang said, S'YOUNG has accumulated more than 6000 offline outlets in China, and the coverage of online channels has reached 100%. With these rich online channels, we have the ability to quickly update user data. Our precision marketing provides innate advantages. For its agency brand Shuiyang International, S'YOUNG also gave a special data system to analyze and update the data of the pre-flow and post-conversion.

4.1.3. Service Guidance and Rapid Conversion

According to related reports in the beauty industry, S'YOUNG focuses on the brand building of high-value-added fast-moving consumer goods and online sales channels. It has strong team cohesion and a strong sense of time. It adheres to the concept of 'customer is God'. No matter how large the sales volume, all employees of S'YOUNG will try their best to process all orders in the shortest possible time, creating the sales miracle of 'UNIFON'. As its president Dai said, 'For the cooperative of other agents and brands, more energy will be put on 'how to increase sales through marketing'. What our Shuiyang International does is not only sales, but also service, logistics, a full set of marketing and other services. 'We have mature network integration services that can accurately and in real-time transfer user data. Such pre-sales and after-sales services increase the rapid conversion of customers on the one hand and increase customer loyalty on the other.'

From this point of view, S'YOUNG, as a representative of corporate value transformation cooperative assets, realizing its real-time value mainly depends on accurate data acquisition, rapid analysis, and a full set of data streams. This aspect emphasizes the timeliness of the data, and also emphasizes the accuracy, and the key to ensuring these is the closed-loop data system. In the research of this article, it is summarized as the 'data road' feature (see Table 4).

Table 4. Examples of typical corporate cooperative assets (Case A).

Cooperative Assets	Main Construct	Secondary Construct	Examples
Value conversion type (corporate big data cooperative assets)	Data Road	Network integration	Through mature network integration services, UNIFON has left a positive brand image in the hearts of customers, and good brand pre-sales and after-sales services have also enhanced customer loyalty. (A1) Dai Yuefeng said that even if Shuiyang International can solve product problems, it cannot solve after-sales problems. What Shuiyang International has to do is not only sales, but also a full set of services such as service, logistics, and marketing. (A1) Online channel coverage has reached 100%. The rich management system of all channels online and offline, long-standing, also provides inherent advantages for Shuiyang International. (A1) Muxiang said that Shuiyang International, through UNIFON's online and offline resources, will cover in the short term all mainstream channels for cooperative brands. (A1)
		Precise positioning	S'YOUNG categorizes Dr. Ci: Labo's products into three tiers: head, waist, and tail. These tiers represent categories based on product type and price point. This categorization allows S'YOUNG to identify consumer pain points based on product functions and characteristics, and subsequently target specific consumer groups. For core products like Dr. Ci: Labo, S'YOUNG analyzes pre-flow and post-conversion data to implement precise marketing and promotion strategies. (A1)
		Fast delivery	S'YOUNG focuses on the brand building of network high-value-added fast-moving consumer goods and the construction of online sales channels. It has strong team cohesion, a strong time concept, and adheres to the concept of 'customer is God'. No matter how large the sales volume, all S'YOUNG employees will try their best to ensure all orders are processed within the shortest possible time, creating a sales miracle for "UNIFON". (A1) In terms of the purchase and sale of goods, and the good management of returns, the process of return and exchange is very convenient, which has greatly increased the trust of many customers in the UNIFON brand. (A1)

4.2. Value Realization Mechanism of Conversion Type (User Value Conversion Big Data Cooperative Assets)

Aiming at user value conversion of big data cooperative assets, this article mainly uses company B (i.e., Perfect Diary Group) as a case to expand the analysis. Unlike S'YOUNG Group, Perfect Diary Group mainly targets specific groups of people, with the goal of realizing the rapid conversion of these users.

By studying the case of Perfect Diary Group, this article finds that the realization of its instant value mainly depends on the product promotion initiated by users in the targeted specific groups, and the social marketing communication caused by this, plus omnichannel and fast service process. In this process, what's interesting is that the case company leveraged the marketing campaigns of the most influential people among the targeted specific groups of people and carried out marketing promotion to these affected groups to realize their rapid realization, which triggered recurrences. A round of communication effects and user conversion.

The real-time value realization of its value-transformed cooperative assets specifically includes three stages: (1) locating special target user groups to find social marketers; (2) cooperating with social celebrities to obtain group feedback; and (3) promoting secondary social communication and tapping potential users to carry out and realize the rapid conversion phase.

4.2.1. Social Marketing and Targeted User Groups

Perfect Diary shows the precise positioning of its own brand and the grasp of social marketers. In the early stages of its development, Perfect Diary was positioned as a fashionable young woman and liked to play with the internet. In the early stages of development, it chose Redbook for 90% of young women. In the selection of social celebrities, Perfect Diary is even more meticulous. It ranks the beauty bloggers of Redbook according to the "1-9-90" rule of influence and network content, with '1' for celebrities, '9' for big V (the 'V' means highly impactful people) and medium and small V, and '90' for more extensive grassroots, and bases on this for product promotion. The star Lin Yun was also the 'social celebrity' of Perfect Diary, who has a very good influence. Like Zhang, who was still studying for a master's degree at Beijing Normal University in 2017, said, 'At that time, I saw the recommendation of the star Lin Yun on Redbook and bought the Perfect Diary product for the first time.'

Not only Redbook, but with the development of the brand, Taobao Live is another platform that uses live broadcasts to interact with fans, coupled with short videos to build a 'grass' matrix, which creates an atmosphere conducive to widespread product promotion. At the peak of its development, Perfect Diary was evaluated by its own beauty community leader 'Veggie': 'The perfect diary was instantly popularized on social networks through extensive online promotion.' Moreover, Perfect Diary has staff dedicated to Business Development (BD), responsible for 'social celebrity' auditions. Thanks to this, Perfect Diary stated in the prospectus that 'we are the first batch' to include Li Jiaqi, Wei Ya and nearly 15,000 brands, collaborating with different well-known figures through community leaders.

Overall, Perfect Diary has made great efforts in selecting its own "social influence" personnel for its special group, looking for comments on bloggers from massive user data, and quickly conducting blogger cooperative negotiations. This is also a key factor for its success.

4.2.2. Social Celebrity Collaboration and Group Feedback

The Perfect Diary Company primarily collaborates directly with community leaders through a data-driven community leader management system. This approach allows them to obtain user conversion rates and other relevant data without relying on intermediaries such as MCNs or public relations companies. The company refers to this strategy as a "direct relationship with community leaders and other social marketing models".

For example, beauty community leader 'Veggie', who has worked with Perfect Diary, said bluntly: 'I am the community leader of Perfect Diary who took the initiative to send a private message to me and asked if I would like to join Perfect Diary's marketing plan. I acted as a conveyer'. The beauty community leader's role in conveying consumer opinions is to 'plant grass' for fans.

The first batch of users attracted by "social celebrities", Perfect Diary will place a "red envelope card" in the package when they consume; after scanning the QR code to follow the official account, the official account will immediately push a page containing the individual's two-dimensional code number, its unified identification is "Xiao Wanzi". After analyzing the user conversion at this stage of "Xiao Wanzi", Perfect Diary can easily obtain the attractive information of beauty bloggers to select better bloggers for more matching product promotion.

4.2.3. Leveraging Social Interaction to Enhance User Engagement and Conversion

After the completion of the second stage, Perfect Diary successfully won its first batch of "sugar" user groups. This first batch of amateur groups, under the daily interaction of the 'Xiao Wanzi' persona (such as publishing high-quality beauty content to interact with consumers), paid attention to and discussed, and published their own "comment" notes. Especially after purchasing products, they competed to imitate popular bloggers by writing about their experiences and taking notes, which perfectly contributed to the marketing effect of the benign interaction between the Perfect Diary brand and users.

Today, Perfect Diary has formed a KOL (community leader)-KOC (well-known celebrities)-consumer communication chain with Redbook and Taobao live broadcasts. The official account of Redbook has 1.97 million fans; the Douyin platform has accumulated 2.325 million fans, and the total number of praises reached 21.7 million on Station B. Perfect Diary is the second-largest domestic brand in the post-00 fan ratio, second only to Huawei.

Undoubtedly, identifying the target group and focusing on new media channels for social communication promotion has created a successful brand image, exemplified by the "Perfect Diary" brand, which has become synonymous with innovation, playfulness, and fashion. In this process, the key to success is actively seeking out social influencers among target users and cooperating with them to achieve faster and larger-scale audience engagement, thereby achieving higher instant value. This article summarizes 'content matching' as a typical feature of the path to realizing the value of Perfect Diary's cooperative approach. It emphasizes that users, as drivers of value creation, can also actively share corporate service information to encourage similar user groups to quickly match their needs with services, and promote the realization of real-time value of cooperative assets (see Table 5).

4.3. Value Realization Mechanism of Accumulation Type (Enterprise Value Accumulation Big Data Cooperative Assets)

Aiming at the Enterprise value accumulation of big data cooperative assets, this article mainly uses company C (namely Winona Group) as a case for analysis. As a product for sensitive muscle groups, Winona Group has obtained a large amount of user research data, combined with its own research strength to carry out product development, and has achieved unique and eye-catching performance.

In the case study of Winona Group, this analysis revealed that the realization path of its potential value mainly emphasizes that the dominant player in the interactive behavior is the enterprise, which can use the data left in the process of interacting with users in multiple ways. The company accumulates, analyzes, and utilizes these traces, and the potential value of cooperative assets is realized. The key to this process is how to obtain and store data in multiple dimensions and extract powerful innovative value from the data. This analysis divides its value realization path into three stages: the stage of acquiring user data traces through multiple channels; the stage of integrating and refining new product

concepts with the acquired multi-dimensional user data; and the stage of new product development and launch.

Table 5. Examples of typical corporate cooperative assets (Case B).

Cooperative Assets	Main Construct	Secondary Construct	Example
Value conversion type (user big data cooperative assets)	Content match	Special goal	The main camp of Perfect Diary is 90% young women on Redbook. With the help of Redbook, it has formed a KOL-KOC-suren-suren transmission chain. Now it has more than 1.95 million fans on Redbook. (b1) Perfect Diary focuses on integrating corporate culture into the product and, at the same time, endows it with a tonality that is close to the people, cute, story-oriented, interactive, young, and energetic. It builds a high-end brand from many aspects, yet friendly enough, connotative but extremely cute, in line with the aesthetics of today's public, especially young women. (B1)
		Social marketing	Lock in the mid-waist network celebrity matrix, use amateurs for content marketing (closer to reality), enhance user stickiness, and realize traffic monetization. (B1) Most of the notes come from the experience and feelings of ordinary users, the recommendations of consumers' conscience, and the application of life scenes greatly increase the trust of users in the brand and resonate well with them as well. (b1)
		Comprehensive channels	In addition to the two main camps of Redbook and Taobao, the marketing advertisements of Perfect Diary can be seen everywhere in Douyin, Kuaishou, Weibo, and Station B, which almost completely cover the target group. (B1) Kuaishou live broadcast also has a very good conversion effect. Perfect Diary has also been stationed in Kuaishou live broadcast. More than 10 million viewers watched the live broadcast. The sales of one live broadcast exceeded 16.08 million yuan. (b1) Perfect Diary has 3.042 million Douyin fans and 24.56 million likes. The main content is new product promotion, makeup display, and story videos. It directly links to the Tmall store, connects content and sales, and achieves direct conversion. (b1)

4.3.1. Multi-Channel Acquisition of User Activity Data

As mentioned above, Winona Group is unique in its new product development path based on user interaction data. At this stage, whether Winona Group can obtain user data traces through various channels has become a key link. For example, the user's product portfolio data, preferred product ingredient data, etc.

Different from other cosmetic service providers, the massive user data that its product development relies on mainly comes from consultations with dermatologists who make the most of it. The dermatology consultation is conducted by Winona Group through multiple channels. For instance, they carried out live free consultations on the official Weibo and invited experts who had to go to the hospital to register to consult and invited experts to Winona's Weibo live broadcast room to carry out hundreds of free consultations. The most realistic result is that their Weibo fans have already reached 1.49 million.

Secondly, Winona's distribution is not only in the top three hospitals, but even to township health centers, beauty salons, etc., in obtaining various online data. Winona uses the post office to conduct online cloud business and open the 'Guardian Cloud' Post Office Live Room. Working with experts to continue the 'Sensitive Guardian' program of 'Cloud Guardian', through a 10-day online master's presence in the post office's live broadcast room, a nationwide 1-to-1 free skin Q&A activity was launched, covering more than 500 key cities across the country to reach every corner of Chinese skin care and obtain a large amount of user data.

As Winona's president said: 'Winona has acquired a large amount of user data based on the accumulation of online academic marketing and word-of-mouth communication supported by big data, as well as reaching consumers in urban areas, and successfully captured e-commerce traffic. Our brand's advantage is that it can establish clear user portraits, accumulate more three-dimensional consumer assets, and help us develop new products, which was not possible through traditional channels before.

4.3.2. Integrating Multi-Dimensional User Data to Refine New Product Concepts

By merging and analyzing the multiple data obtained from these multiple channels, companies can further update and transform existing services and condense new service or product concepts to promote corporate innovation and realize the potential value of big data cooperative assets.

When talking about the importance of user data, Winona's data analyst pointed out: 'One of the core departments established by Winona at the beginning of the business is the data department which focuses more on reaching consumers and then do user opera-tions. Through the acquisition of data through multiple channels, they can accurately analyze users and understand their attributes, including their life state, economic level, and content of interest, etc., and then conduct product research and development. Every year, Winona's multi-channel prescription rate exceeds 2 million cases. The data is quite amazing. But for them, it is a win to gain insights into the needs of users from the middle and give them to the Sensitive Muscle Research Institute that they cooperate with to conduct their own research and development.

4.3.3. New Product Development and Launch

From insight into user needs to launching new products with its own medical background, and then linking users with consumer experience, Winona is different from ordinary cosmetic service providers.

Winona's predecessor was the Yunnan Skin Care Project Group, a subsidiary of the second largest pharmaceutical company, Dianhong Pharmaceutical. The current parent company is Betteni Biological Technology Co., Ltd. (Kunming, China). This group was established in 2010. It is a health industry group integrating R&D, production and marketing. Relying on the diversity of Yunnan's plant resources and a large amount of user data research, Winona's brand concept of 'functional skin care with sensitive skin' resonates with users.

To sum up, with the development of big data technology, Winona has acquired higher data analysis technology, data fusion and development have become more and more efficient, and the potential value of its cooperative assets can be better realized (see Table 6).

4.4. Value Realization Mechanism of Accumulation Type (User Value Accumulation Big Data Cooperative Assets)

This article uses company D (namely Florasis Group) as a case of user value accumulation big data cooperative assets to carry out related research. This value generation path emphasizes that users can actively transfer their own service experience and personal knowledge to enterprises and other users, promote the formation of innovative concepts such as new product research and development, that is, promote the realization of the potential value of cooperative assets. The key to this mechanism lies in the participation of users, especially the contribution of personal intellectual capital.

After an in-depth study of this case, this article found that the user community established by the Florasis Group is the core element of its success. Specifically, the brand users of Florasis take the initiative to share product experiences (such as use in different scenarios), innovative ideas, etc. on the open platform or user community of the company, and other users or companies can discuss this and form opinion updates. Among these, ideas with a higher degree of recognition can help companies guide the renewal and transformation of existing products or the development of new products.

Comprehensive case, this article also divides this path into three stages: co-creation platform development and user data acquisition stage; user data insight stage; new product development and launch stage.

Table 6. Examples of typical corporate cooperative assets (Case C).

Cooperative Assets	Main Construct	Secondary Construct	Example
Value accumulation type (corporate big data cooperative assets)	Data development	Diverse data	The coverage rate of the Winona brand in hospitals across the country exceeds 70%, and the prescription rate exceeds 2 million. The data is quite astonishing. (c1) Hundreds of on-site free consultations have been carried out. The most realistic result is that his Weibo fans have reached 1.49 million, while only 130,000 HFP has social media firsts and 360,000 perfect diaries. (c1)
		Data Fusion	Now that the era of cosmetics brands relying on single products to win has passed, it is necessary to have different product lines for different consumer groups, carry out internal integration, and develop new products to continue to give consumers a sense of freshness. (C1) Winona has always stood from the perspective of contemporary cosmetic consumers, whether it is the brand concept of 'functional skin care with sensitive skin' or Winona's persistent marketing approach to consumers—it is all about consumption: from insight into the needs of consumers, to connecting consumers with products and consumer experience. (c1)
		Academic cooperation	Winona, through a lot of research relying on the diversity of Yunnan's plant resources, further perfected the extraction of active ingredients and research on efficacy, and finally developed skin care products suitable for sensitive skin to improve common sensitive skin problems. (C1)

4.4.1. Co-Creation Platform Development and Data Acquisition

Since the establishment of the brand, Florasis has allowed users to participate in product development through multiple channels to obtain diverse user data.

Previously, Florasis established a 'mystery experience officer' mechanism, inviting users to experience the full-link service process of Florasis, and welcome users to ask various questions; in addition to the 'mystery experience officer' who can provide comments, if you are a user of Florasis, your opinion will be heard. The users of Florasis had previously complained that the products received on the Redbook platform were damaged and the products were not durable. Soon, the official account of Florasis responded below, not only expressing apologies, but also immediately applying for a green channel for users to solve the problem. Florasis also established a "cultural communicator' mechanism to invite users with relevant professional knowledge to spread Florasis oriental culture, realizing content co-creation and waiting." Florasis has learned from Li Wanqiang "'Sense of Participation' and completed the cornerstone construction of user co-creation", Florasis's president said in an interview.

4.4.2. User Data Insights Generation

Seeing the big from the small, how does Florasis achieve a total of 110,000 innovative products? According to a report released by Bazaarvoice, Florasis has its own back-end data analysis equipment and data analysts and continues to analyze and gain insight into user data obtained through various channels. For example, by analyzing the real evaluations of users in the 'Mystery Experience Officer' community of Florasis, it is not difficult to find that keywords such as 'repurchase', 'stocking', 'new version' and 'improvement' frequently appear, which not only shows the user's attention and loyalty to the Florasis sub-brand but also reflects the brand's product development model from the side, that is, insights

into new developments from data. Florasis's data analysis representative also said that Florasis has formed a kind of 'Internet craftsman thinking'. With the support of big data technology, it analyzes the fusion data of multiple channels and masters the most core part of data processing.

Interestingly, like Perfect Diary, Florasis also has 'influencers' in its user community. The influence of their opinions and the degree of interaction generated by them are higher. Because this process relies on extracting information and innovative ideas from users' usage data and personal knowledge, it is the key path to realizing the potential value of Florasis.

4.4.3. New Product Development and Launch

It is not unreasonable for Florasis to insist on the mechanism of user community co-creation. For example, when a user reported that it was difficult to recognize the powder from the white powder puff of Florasis powder, Florasis soon launched the daisy powder puff to give consumers a more extreme experience. Florasis's star product eyebrow pencil was launched in 3 years after the 7th generation update was completed. The latest "eyebrow chalk" is created by combining user demands and breakthroughs in research and development, so that the makeup effect can take into account the line of an eyebrow pencil and the soft fog of eyebrow powder.

Quality is king, respect for users, slow work and fast iteration—this "customer co-creation" concept and craftsman's research and development spirit have achieved a series of "internal and external" star explosions, attracting consumers to continue repurchasing, and have also built Florasis's current brand (see Table 7).

Table 7. Examples of typical corporate cooperative assets (Case D).

Cooperative Assets	Main Construct	Secondary Construct	Example
Value accumulation type (user big data cooperative assets)	Content co-creation	Co-creating platform	Florasis has established a "cultural communication officer" mechanism, inviting users with relevant professional knowledge to spread Eastern culture with Florasis and realize content co-creation. (d1) On the Redbook platform, if you are a user of Florasis, your opinions will be heard. (D1)
		Data mining	Florasis's star product eyebrow pencil has been on the market for 3 years but has completed its 7th generation update. The latest "eyebrow chalk" is created by combining user demands and breakthroughs in research and development, so that the makeup effect can take into account the line of an eyebrow pencil and the soft mist effect. (d1) Every time a new product is launched, experience officers are invited to conduct new product trials and internal tests. Further mining and development of the acquired data have enabled Florasis's products to innovate. (d1) By analyzing the real evaluations of users on the platform, it not only shows the user's attention and loyalty to the Florasis sub-brand, but also reflects from the side that the brand's product development model comes from the continuous mining of user data.
		User research and development	The opportunity to build a brand does not exist in the existing market, but in the creation of a new market. Seeing the big from the small, Florasis achieved a total of 110,000 innovative products. (D1) In the early stage of brand creation, Florasis allowed users to participate in product development and gradually formed Florasis's "Internet craftsman thinking", "quality is king", "respect for users", "slow workmanship", and "rapid iteration." (d1) Persisting in building an oriental cosmetics brand with users, this strategy undoubtedly makes Florasis a dark horse in the cosmetics industry. (D1)

4.5. Cross-Case Analysis

This study further found that both Company A and Company B are realizing the real-time value of big data cooperative assets, and the key lies in the requirements for the rapid and accurate transmission of data in the interactive process. Specifically, the characteristics of enterprise-led data road and user-led content matching both highlight the precise mining and efficient use of data in the interactive process. This article summarizes it as the 'data link mechanism', summarizing the mechanism of real-time value realization of big data cooperative assets.

Unlike the data link mechanism, which emphasizes immediacy, the data insight mechanism focuses on extracting innovative constructs from accumulated data. From the cases of Company C and Company D, we find that the realization of the potential value of the big data cooperative assets involved in the two cases is reflected in two characteristics: enterprise-led data development and user-led content co-creation. Specifically, the accumulation of data is multi-dimensional, multi-source, and multi-scenario. This data can be effectively integrated to facilitate insight into new knowledge (see Table 8).

Table 8. Typical examples of corporate cooperative assets (with constructs).

Cooperative Assets	Value Realization Mechanism	Main Construct	Secondary Construct
Enterprise value conversion big data cooperative assets	Data link	Data road	Network integration
			Precise positioning
			Fast delivery
User value conversion big data cooperative assets		Content match	Special goal
			Social marketing
			Comprehensive channels
Enterprise value accumulation big data cooperative assets	Data insight	Data development	Diverse data
			Data Fusion
			Academic cooperation
User value accumulation big data cooperative assets		Content co-creation	Co-creating platform
			Data mining
			User research and development

Discussion of these theories and cases could be summarized in Figure 2, which shows the mechanism of forming the value of big data cooperative assets:

From the perspective of value, to realize the real-time value of big data cooperative assets, value-transforming enterprises mainly sell existing products as their main activity. Among them, the company-led interaction process between companies and users is mainly based on precision marketing, that is, accurately positioning target groups and achieving refined sales of products. This requires companies to be as detailed as possible when classifying user groups, so that products and sales are consistent. The user-led interaction process between companies and users is mainly based on live broadcasts, that is, through internet celebrities to drive the real-time value of products and stimulate consumers' desire to buy in real time, which is conducive to gaining higher brand promotion efforts.

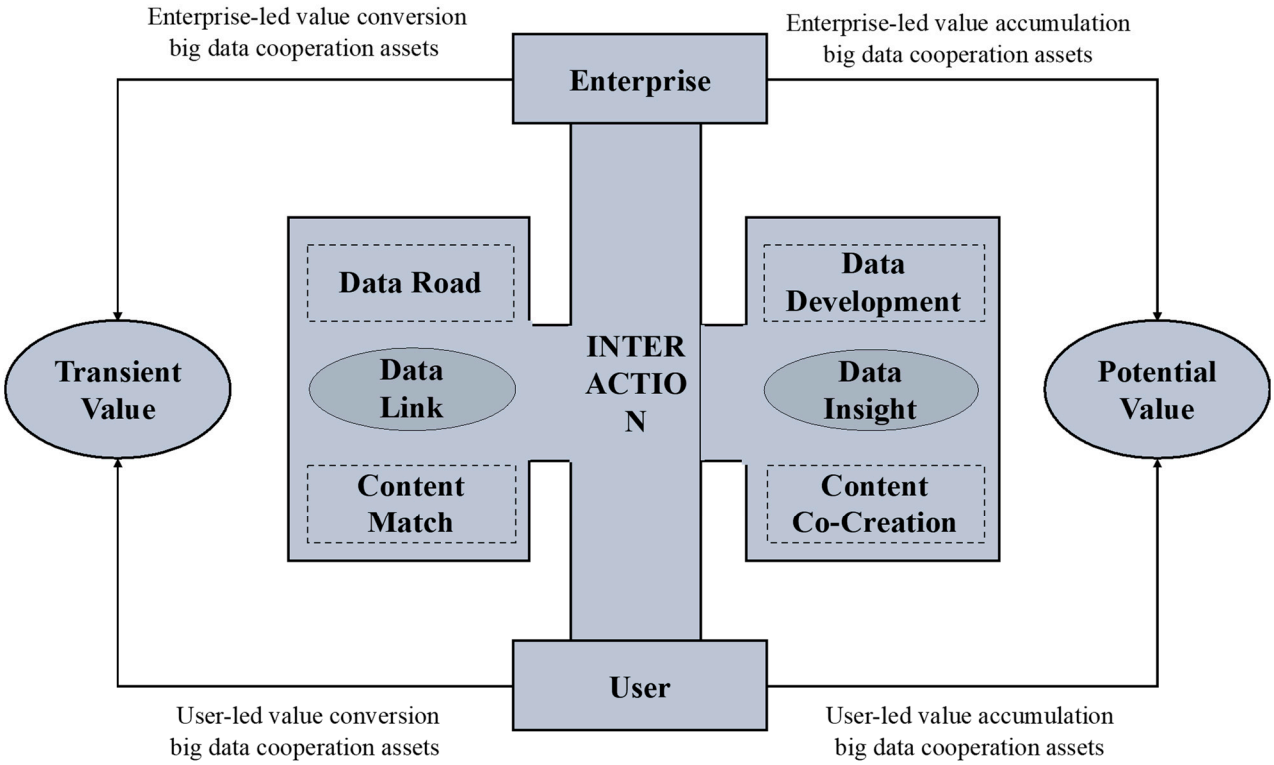

Figure 2. Understanding value formation in big data cooperative assets.

Different from realizing the real-time value of big data cooperative assets, the potential value is mainly based on the enterprise's data insight as a mechanism and is mostly manifested by the development of new products and the improvement of the original operating model. Among them, enterprise-led value realization usually takes product R&D as the main activity. The product R&D process of enterprise-led interaction with users mainly relies on obtaining consumer big data and transferring it to cooperative institutions such as R&D institutions and academic institutions for product R&D. New products are generally launched by enterprises, and users still assume the roles of service providers and end users. Such enterprises often require very high R&D costs and certain social relationships and have extremely high technological guarantees. However, due to its relatively high cost, digital marketing performance, and low innovation in marketing strategies, the understanding of online channels needs to be strengthened. UGC (User product content)/PGC (enterprises product content) is not effectively aggregated and distributed, so there is a lot of room for improvement waiting for companies' promotion. The product development process of user-led enterprise and user interaction mainly relies on users' innovative ideas. Relatively speaking, enterprises are required to have a high degree of user activity, which requires relatively high user loyalty and a certain degree of interaction. However, relying on online platforms, the interaction cost is relatively low, for emerging brands, promoting brand influence is a good choice.

5. Discussion and Conclusions

5.1. Key Findings and Contributions

The rapid development of the internet and big data has promoted increasingly close interaction between user groups and enterprises. From the daily operation of an enterprise to innovative research and development, users play a vital role in influencing revealing assets. The concept of big data cooperative assets has pushed research in this field to a new climax. However, there is still a lack of in-depth analysis of its value formation logic. Unlike previous research, this study emphasizes the time-horizon value of big data cooperative assets, revealing that big data cooperative assets have short-term value

conversion efficiency and can be formed through value accumulation. It is embodied in three aspects:

Firstly, combined with literature review and case analysis, this article innovatively proposes four types of big data cooperative assets based on the two dimensions of time-horizon value and the two interactive dominant subjects: value conversion type (enterprise big data cooperative assets); value conversion type (user big data cooperative assets); value accumulation type (enterprise big data cooperative assets); and value accumulation type (user big data cooperative assets). Different from the existing research on the single-dimensional big data cooperative asset type, this article focuses on combining the two dimensions, breaking through the theoretical research hypothesis in this direction.

Secondly, existing research points out that big data cooperative assets have short-term value. However, the research objects are focused on big data cooperative assets in a broad sense, and the path to realize this value has not been conceptualized. This paper puts forward the concept of a "data link" mechanism. It points out that under this mechanism, enterprise-led interaction presents the characteristics of a data road; user-led interaction presents the characteristics of content matching. This conclusion provides reliable theoretical support for the improvement of data interaction mechanisms for enterprises of different dominant types.

Thirdly, existing research also emphasizes the long-term value of big data cooperative assets. Existing research on long-term value also suffers from a limited scope, failing to expand the research object. This article innovatively puts forward the concept of "data insight". Further, it explains that under the data insight mechanism, enterprise-led interaction presents the characteristics of data development; user-led interaction presents the characteristics of co-creation of content. This conclusion not only conceptualizes the research on the data interaction mechanism based on the potential value of big data cooperative assets, but also deepens the understanding of the characteristics of data interaction under different dominant entities.

In conclusion, the exploration of the mechanism for realizing the time value of big data cooperative assets help enterprises to enhance the immediate and potential economic benefits, which in turn improves their profit margins, achieves sustainable development, and can further promote the construction of a harmonious society and the construction of ecological civilization.

5.2. Key Policy Recommendations

As a production factor, data can promote enterprise innovation and stable development. The support of the government is of far-reaching significance for realizing the value of big data cooperative assets and further promoting the development of the "digital" strategy. As the dominant interactive entity, enterprises can efficiently realize the real-time value and potential value of big data cooperative assets by interacting with users. Enhance its own strategic advantages, as another leading entity of big data cooperative assets, users can actively participate in the interaction with enterprises and contribute their own knowledge, which is an indispensable part of realizing the value of big data cooperative assets.

(1) The government plays a vital role in promoting the digitalization of enterprises to unlock the immediate and potential value of collaborative big data assets.

First, the government needs to undertake the important task of digital infrastructure construction as companies need to have strong digital infrastructure support for digital construction. Since digital infrastructure capital investment is large, and the return period is long, companies lack sufficient funds and incentives to invest in digital infrastructure. Therefore, as a provider of public goods, the government needs to play its own role to promote infrastructure construction.

Again, in view of the difficult, high-pressure, and high-cost nature of digital construction for small and medium-sized enterprises, it is recommended that the government increase financial support for purchases made during the digital transformation of these enterprises. Various cloud services, industrial software, smart sensors, and other professional

equipment should receive financial subsidies from the government. It is also possible to set up a "digital" special compensation fund pool. When faced with systemic risks, the issuance of risk compensation for companies that have completed digital construction will dispel their worries.

Secondly, the government should actively promote data cooperation between enterprises. The current lack of data cooperation between homogeneous enterprises results in a contradiction that lies in the distribution of results and benefits in data sharing. For security reasons, companies lack sufficient incentives to share data to avoid the risk of data leakage. Therefore, the government can act as a trust center between different companies, guiding different companies to share data, and at the same time guide and restrict the issues of data sharing in corporate cooperation. Difficulty in solving the attribution of enterprise cooperation results is also a reason that hinders enterprises from sharing data to create value. At present, there are still system loopholes in patent applications for co-created products, which largely affects the enthusiasm for product co-creation among enterprises or between enterprises and users. Moreover, once there is a problem with the benefit of the follow-up service, there are quite troublesome procedures in intellectual property management, courts and other departments, and the cost is very high. Therefore, inter-governmental functional departments can use a unified data portal to share data, accelerate the process of handling such incidents, and increase the enthusiasm for cooperation between enterprises or between enterprises and users.

Finally, the government should strengthen the supervision and regulation of the security protection work of enterprise big data platforms. This is due to the gradual reduction of the live broadcast threshold (such as the number of fans), the support of various policies, and the remarkable educational achievements of the market, leading to more businesses using mobile phones. Live broadcasts display products in a wider range of time periods and in more scenes, such as factories, stalls, points of origin, counters, and live broadcast rooms. Businesses can also settle in live broadcast bases while solving supply problems. This diversification of scenes, on the one hand, shows the penetration and driving effect of live broadcasting into offline retail formats. On the other hand, it shows the penetration of the upstream of the industrial chain, thereby further shortening the circulation channels and improving the efficiency of the industrial chain. In response to the above phenomenon, the government should increase its rectification efforts. On one hand, head anchors should be more rigorous in selecting products and establishing after-sales teams. Similarly, tax policy has to become stricter, thereby increasing the cost of violations.

(2) As the primary agents of interaction, enterprises play an irreplaceable role in realizing the value of cooperative big data assets to enhance their competitive advantages.

From the perspective of value realization, whether it is the formation of big data co-operative assets led by enterprises or the formation of big data cooperative assets led by users, it is reflected in the realization of its immediate value and the realization of potential value. The analysis in this article points out that current enterprises are biased in emphasis. For example, in this article, S'YOUNG and Winona Group overemphasize the dominance of a certain one-dimensional value, and if the two learn from each other and weigh the potential value of development and the immediate value, the company should achieve better development. Especially in this era of the digital economy, the market competition environment and user needs are changing drastically. If only one of the real-time value and potential value is emphasized, companies will lose a lot of room for profit, and weighing development is fundamental. However, when weighing development, we must also pay attention to methods, choosing companies with similar backgrounds to learn from, or to cooperate to reduce certain risks. For example, enterprise-led enterprises can obtain certain user resources and social influence through cooperative product promotion with user-led emerging brands, and develop relatively popular interactive channels, which can enable enterprises to obtain a large amount of external resource support in the short term. With potential user influence, it becomes possible to expand user-led service channels separately; user-led enterprises and enterprise-led types of enterprises cooperate, with the help of

their resource advantages, give play to their user knowledge advantages, jointly promote products, and quickly seize profits to promote development, obtain investment, and so on.

Furthermore, companies can establish data co-ops (data cooperative systems) to apply user insights and models to third-party data to target audiences, thereby improving the development of the technical data environment and promoting the achievement of the highest level of privacy and security for companies and partners. These data environments exist independently and are not intended to replace CDPs (Central Data Processing Systems) used as the main storage of first-party data. Instead, they supplement them and provide neutral solutions to help partners share data; even a data market can be established. Such exchanges, where owners can exchange data, use third-party solutions, or perform further analysis outside of marketing use cases, offer further possibilities.

(3) As another dominant subject of interaction, the status and role of users should also not be ignored.

For users, their dissatisfaction with the interaction and cooperation with enterprises is mainly concentrated in five areas: (1) Merchants, especially those with live broadcasts, have failed to fully fulfill the obligation of publicity of license information; (2) Some "social celebrities", especially "stars"/"anchors", are suspected of having illegal publicity issues such as promoting product efficacy or using restricted words during live broadcasts; (3) Product quality still has problems, especially with "three no" products (products without a production date, quality certificate, or manufacturer's information), and fake and inferior products being given away are very common; (4) Fan data and sales volume reviews show very obvious signs of single fraud that "kills young people"; and (5) After-sales service is difficult to guarantee. Under these circumstances, it is difficult for users to defend their rights and have nowhere to speak up.

Therefore, the key to promoting user interaction and cooperation is that users have certain rights. First, through legal interpretation and empowerment, legal supervision and the formulation of industry regulations, etc., promote and restrict the behavior of live broadcasts to enter the track of the rule of law. Specifically, users can evaluate live broadcast products and sales behaviors of companies through channels such as the Consumer Association, People's Daily, etc., and request investigations. Users can watch and question them in-depth. For example, some netizens reported that they purchased a 1999-yuan Gree air conditioner on a certain platform under the propaganda of four cargo anchors on 1 May 2020, and it was marked that it would be shipped on May 28. Until May 28th, the merchant changed the delivery date to before May 30, but there was still no shipment after two days. When the customer service was probed, they just replied "please be patient" with a robotic response. By the evening of June 16, the "Gome Official Flagship Store" gave a direct refund. Netizens said that they had sent private messages on the official Weibo of the local Consumers Association, and on their own Weibo @ Consumer Association, asking Gome to deliver the goods immediately and apologize, and received quick feedback.

Secondly, users can innovate the online consumption rights protection mechanism and actively participate in the "red and black list" action through the spontaneously established online promotion consumer complaint publicity system, which forces companies to standardize their behavior and consciously be honest. Pull platforms, merchants, and internet celebrities with serious violations of the law and more tainted information onto the "blacklist", and pull online platforms with a strong awareness of rules and good consumer appraisals onto the "red list", and fully participate through their own participation. Protection must be sought for our legal rights and interests, such as the right to know, the right to choose, and the right to fair dealing. Alibaba has created a public review mechanism, a governance model in which ordinary users can participate extensively online. Currently, there are nearly 5 million members, and a total of 100 million dispute judgments have been completed.

Finally, users should actively participate in publicity, education, and guidance activities related to protecting consumers' personal information to raise awareness about personal information protection. For example, they should clarify the nature of their con-

sumption data and the boundaries of its legal use. Currently, my country and mainstream e-commerce platforms have formulated and developed a complete set of platform rules, including a credit evaluation system, a violation penalty system, and guidelines for technical data application. A clear understanding of these systems is another important way for users to make their voices heard.

In short, a pattern of sharing and co-governance of big data cooperative assets by governments, enterprises, consumers, and other parties has begun to emerge. Relying on ever-changing technological means and the ever-improving system of intellectual property protection standards and rules to strengthen cooperation and dialogue among these stakeholders can provide new solutions for realizing the value of big data cooperative assets and inject new momentum into innovation and development.

5.3. Limitations

This study has certain limitations. First, the theoretical construction and case analysis of this article are based on the highly personalized cosmetic service industry. Whether the research conclusions are applicable to other industries needs further discussion. In particular, whether the interaction costs and benefits of big data cooperative assets are universal, and whether the main formation or manifestation of the four big data cooperative assets are universal remains to be studied.

Secondly, the research of this article focuses on the time dimension of big data cooperative assets and does not emphasize the value of other dimensions. In addition, although it does not affect the conclusions of this research, this research does not consider the impact of the company's cycle. That is, to consider the requirements of different stages of the company's cycles, scenarios, and contexts, only the value of a specific cycle is considered, and cross-cycle and cross-scenario research is not conducted.

Finally, notwithstanding that this study collects data through various channels such as web information, financial reports, and social reports, it is inevitable that there is a certain degree of deficiency in capturing and assessing customer information. Therefore, follow-up research can be more fully developed through the development of scales, collecting customer data to analyze the type dimensions of big data cooperative assets, and subsequently conducting corresponding empirical research. On the other hand, regarding the formation of the four types of big data cooperative asset types and the core competitive advantages they bring to enterprises, this article does not discuss them in detail. For example, further research could investigate whether the core competitive advantages brought by value transformation and value accumulation big data cooperative assets are different, and the extent of that difference. This represents a key area for follow-up research and can further improve the theory constructed in this research.

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Institutional Review Board Statement: The study utilized two types of data: (1) Original data: Collected directly from respondents on topics such as consumer demands and market competition. This data did not include sensitive personal information and posed minimal risk to participants, and (2) Second-hand data: Existing data obtained indirectly from other sources, which could not be traced back to individuals. Therefore, neither data type required ethical review.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The interview data cannot be shared publicly due to concerns that it may be misused or misinterpreted. The data is highly contextual, and sharing it without adequate explanation could lead to misunderstanding or harm to participants.

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