A SYSTEMATIC LITERATURE REVIEW OF VALUE COCREATION IN ONLINE SERVICES FROM THE PERSPECTIVE OF ACTIVITY THEORY[1]

Yuhui Meng
School of Business, Pusan National University
2, Busandaehak-ro 63beon-gil, Busan, South Korea
sarahmengyuhui@163.com

Ying Li[2]
School of Business, Liaoning University
No.58 Daoyi South Avenue, Daoyi District, Shenyang, Liaoning Province, China
liying@lnu.edu.cn

Jian Mou[2]
School of Business, Pusan National University
2, Busandaehak-ro 63beon-gil, Geumjeong-gu, Busan, 46241, South Korea
jian.mou@pusan.ac.kr

ABSTRACT

To elucidate the research on value cocreation (VCC) in online services, it is important to identify and understand the main participants in cocreation activities, the elements of participation, and how they engage in cocreation. Therefore, this study addresses these research motivations from the activity theory perspective. We extracted articles from 2010 to 2022 concerning VCC in online services and identified over 161 papers published in the Elsevier Science Direct, Web of Science, and Emerald databases. This study describes the cocreation process and analyzes its driving factors and the cocreation mediators among multiple cocreation subjects. We develop a VCC model for online services based on the activity system model; this model offers a preliminary outline of a research agenda for the study of VCC in online services. This study can also help companies consider their own VCC strategy in online services.

Keywords: Value cocreation; Online services; Value cocreation process; Driving factor

1. Introduction

In recent years, value cocreation (VCC) has been gaining popularity across industries and academic research. Initial VCC participants are defined as actors such as consumers/providers participating together in an activity to create value (such as service exchange and resource integration) (Norman & Ramírez, 1994). Early in 2008, consumers were regarded as cocreators of value (Xie et al., 2008). The degree of cocreation is defined as a function of the scope of consumer cocreation in new product design activities and the intensity of those activities (Hoyer et al., 2010). Accordingly, we can think of cocreation as a cooperative activity in the provision of services, such as new product development. Many scholars have discussed the importance of VCC ideas/ strategies. First, VCC can create new product/service processes that generate value. As Artemis et al. (2013) pointed out, in contrast to the traditional output-oriented project management methodology, it is suggested that a project be defined as a VCC process, which could provide and create new products, new processes for suppliers and customers, thus generating new value. Second, VCC can help to understand consumers' demands and behavior and establish a good communication channel for the purchasing process. Liu et al. (2022) pointed out that VCC is a new marketing strategy that influences green buying behavior by encouraging consumers to participate in VCC. Thus, VCC research is of great value to enterprise marketing, service product/ process improvement, and consumer behavior research.

The research has changed from value, value creation, and perceived value to VCC. For global supply chains and new retail, research on data information sharing or data platform development and interactivity based on information

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[2] Corresponding author

technology (IT) has become indispensable. The aforementioned topics inevitably rely on IT and are related to some form of online services, which are classified in the literature review section. Currently, a specific information system can be designed based on a company's demand, and different but relevant service systems can be combined with business-related applications, which depend on cloud technologies or the improvement of web technology. Research shows that service system design can adopt the design-oriented systematic inventive thinking (DSIT) approach (Wang et al., 2017) and the dominant-user approach (Lessard, 2015; Kimitaa et al., 2016). Users have participated in the development and design of the auxiliary system (Conradiea et al., 2015) and have established transportation service systems to achieve the coordinated development of regulatory authorities and transportation entities to achieve win-win collaborative value creation (Voytenkov & Vitvitskiy, 2018). With the development of e-commerce, several enterprises and organizations have gradually turned to online services to overcome space limits and satisfy customers' demands. However, online VCC activities not only are limited to economic transactions but also include any online cocreation activities that can promote social development and enhance social, ecological, environmental, and cultural benefits; these activities include residents' participation in urban construction based on digital media technology aiming to improve public service facilities and create well-being for residents (Münster et al., 2017; Laakkonen et al., 2019). Through reviewing the literature, we found first, research on online services is largely focused on client-centric operations and lacks a strategic orientation (Kunz & Hogrefe, 2011). As mentioned above, VCC is a novel marketing strategy (Liu et al., 2022); thus, VCC could be a new strategic perspective for further exploring online services research beyond the traditional client-centric research perspectives. Second, VCC could promote the implementation of economic value, social value, ecological value, and cultural value in online services. The implementation of these kinds of values could also benefit all relevant subjects in online services. Furthermore, there is a lack of a summary of theoretical research frameworks of VCC in online services. Hence, by analyzing the relevant literature, we demonstrate that scholars focused more on a specific field in the online services category, such as e-health VCC. In addition, we find that there is a lack of scholars conducting a literature review on VCC in online services including all salient online services categories.

To map the elements in VCC, we employed the activity theory that has been well employed in studying online games. A gaming community based on VCC can be regarded as an activity system, and subjects "players" communicated with each other through activity intermediaries "virtual communities" to share game experiences or ideas (Vardaxoglou & Baralou, 2012). As mentioned above, the basic premise of cocreation is that each participant or group of participants brings a unique set of skills and resources that can be utilized by other participants/groups to further the realization of common goals (Brugmann & Prahalad, 2007), which, in the gaming community, entails developing a game platform in line with players' desires. Applying activity theory to VCC in online services research, we aim to clarify several core issues: Who are the main participants in online service cocreation activities based on current literature? How do these major participants exchange ideas and participate in cocreation activities? What are the results of cocreation activities? Activity theory suggests that people's social activity comprises the process of exchanging ideas through interactions (Kaptelinin, 2013), that is, the online service VCC process in our research. In addressing these main research questions, we aim to clarify the main elements and trends in the research on online services based on VCC, explain the relevant cocreation processes, and analyze its driving factors as well as cocreation mediators. Finally, we identify and summarize the deficiencies in the current research to indicate avenues for future research on online services based on VCC.

2. Concept Development from Value Creation to VCC
2.1. Value Creation by Customers and Marketers

The discourse on VCC goes back to the creation of value by customers or firms in economic activity. Marketers create value while producing certain products or services, which include not only tangible products but also intangible services such as mental production or spiritual services (Cooper et al., 2016). Any business has two basic functions—marketing and innovation. Typically, buyers negotiate price agreements and quality standards for products, while sellers (marketers) provide products or services. Both functions use different marketing channels to promote their products and brand images; in this process, sellers not only provide the buyers with products and obtain economic benefits but also promote market sharing and shape the brand images of their products to a certain extent. In addition, marketers may not just belong to a certain company; they may also be sellers to end consumers. At the same time, spiritual production aimed at improving the level of spiritual civilization of citizens and society as a whole or shaping ideology is also the result of value creation, as stated by Münster et al. (2017).

2.2. The Research on VCC

VCC refers to the participation of the community based on the interests of its members in the same task for a common goal (Brugmann & Prahalad, 2007). Additionally, VCC can be considered a type of service exchange and resource integration (Eletxigerra et al., 2018). Companies are willing to let customers participate in the design and

creation of products and subsequently in the production process and creation of value; thus, resources can be deemed antecedents of VCC. Firm and customer resources are considered the main elements operating as value drivers (Paredes et al., 2014). They also discussed customers would objectively evaluate the role played by resources in value exchange since resource exchange and synthesis are bound to consume a certain amount of time and money. Besides, VCC outcomes are related to increasing customers' well-being in some respects (Vargo et al., 2008). Chen et al. (2020) emphasized that residents' participation in tourists' value creation has a positive impact on their subjective well-being, residents' supportive attitude toward tourism development has a positive impact on VCC, and residents' perceived tourism development cost negatively affects VCC. Gonzalez-Mansilla et al. (2019) mentioned that customers' participation affects their perceived value and that their participation depends on the perception of the VCC process supported by the hotel.

Ranjan and Read (2021) pointed out that the focus of cocreation activities comprises interactivity, participation, personalized features, experience in passing, and knowledge sharing. In the process of agreement value creation, stakeholders should have certain agreements or legal contracts to maintain the reliability of transactions and other activities and to clarify the relationship between rights and responsibilities. Moreover, regarding electronic service VCC, developing digital resources and electronic services based on technology facilitates knowledge transfer and knowledge sharing without spatial limitations, creating open-ended value (Henfridsson et al., 2018).

3. Research Methodology

A systematic literature review helps identify the form and scope of the literature on a specific topic and provides a wide review of primary studies within a special topic in the stage of initial examination in a specific domain (Tranfield et al., 2003). This investigation follows the guidelines declared to systematically examine the research on VCC in online services (Kitchenham et al., 2007); accordingly, the core traits of this kind of study are as follows:

1) A protocol, which identifies the research question and implementation of those principles followed in performing the activities, is defined for literature retrieval;

2) A search strategy is clarified and documented to find most of the relevant works in our field of research;

3) The quality criteria for the inclusion, exclusion, and evaluation of research content are clarified.

First, a protocol is used to identify the demand for a systematic literature review and to ensure the relevance and necessity of conducting such a review. Although some related studies introduce this subject in some specific fields or topics, they have not provided a complete and updated overview covering different fields or topics from a macro perspective.

Systematic literature reviews are useful for examining when and where studies are published and the outcomes of each study. To cover studies related to the research topic, we use "value cocreation" and "online service" as the search terms and search the databases of Elsevier ScienceDirect, Web of Science, and Emerald. The Elsevier ScienceDirect database is published by Elsevier Science, and its published journals are recognized as the world's highest-grade academic journals. The Web of Science is the world's most extensive and all-encompassing information repository, spanning a wide array of disciplines and encompassing essential academic journals in natural sciences, engineering technology, biomedicine, and various other research domains. Emerald, which was founded in 1967 by academics at Bradford University Management Center, has been publishing books on management as well as the humanities and social sciences. Therefore, the search for authoritative journals based on the above three databases can absorb most scholars' views and research results.

The selection criteria limit the inclusion and exclusion of studies from the research; these criteria, including the time period, language, article type, and journal impact factor, are described in Section 4.

The next step in refining the protocol is to define the data to be extracted from the studies. This process involves the browsing of the title, abstract, keywords, conclusions, and whole text of the identified articles, if necessary. The content of the selected articles should belong to the themes of both VCC and online services, which are key to the conceptualization of the research on VCC in online services. To cover more research, some forthcoming papers or manuscripts are also included.

Next, we classify the retrieved articles based on the theoretical perspectives and content of previous scholars. This study also analyzes the research methods and research fields while summarizing basic theories to serve as a reference and offer suggestions for future research. Our analysis adopts activity theory as the theoretical perspective/lens for evaluating VCC in online services for the following reasons: 1) A major problem was clarified, that is, who are the main participants in online service cocreation activity, while the connotation of these main participants is consistent with that of the elements "subject"/ "object" in the activity system model. In other words, the "subject" and "object" elements in the activity system model can effectively address the main problem of this study. 2) In addition, the elements of "rules"/ "community" / "tool mediation artifacts" in the activity system model can be applied in our research to identify the different participation elements of VCC in online services, rendering the

research more comprehensive and in-depth. 3) VCC in online services emphasizes that participants participate in co-creative activities to share perspectives and ideas. This opinion aligns with the core idea of activity theory, i.e., the process by which people exchange ideas through social interactions (Kaptelinin, 2013). Therefore, activity theory can effectively explain the VCC process in online services.

In summary, the information extracted is as follows:

1) Year of publication and number of articles published each year;

2) Type of research method;

3) Theoretical lens

We employ a process from a systematic review protocol to determine the scope of the review of the literature, clear data sources, select the keyword search string, set the inclusion and exclusion criteria, and then establish the sample literature database of the research to be reviewed (Ranjan & Read, 2021). Figure 1 illustrates the review process involved.

4. Literature Review and Results

4.1. Selection of Research Samples for the Literature

First, we search the Elsevier ScienceDirect database, choosing "value cocreation" and "online service" as the two keywords, which should exist at the same time within each article. After selecting review and research articles as the article type, we identify 340 relevant studies, of which only two were published before 2010 (in 2005 and 2007); we select the period from 2010 to 2022, thereby creating a sample of 300 relevant articles. To find the differences in published dates, we modify the period from 2015 to 2022 and find 278 papers published during this period. This approach shows that online service research related to VCC has grown tremendously in the last eight years since almost 93% of the identified articles have been published after 2015.

Thereafter, we search the public area of business/management and accounting and identify a total of 197 articles. We exclude 2 articles from the Australia Marketing Journal, as this journal is not indexed in the Social Sciences Citation Index (SSCI). All SSCI publications are examined to ensure the authoritativeness and representativeness of the sample, for a total of 195 articles. After checking all the titles, 157 relevant papers remain. Notably, research on VCC in online services is concentrated primarily within specialized journals concerning business management, such as the Journal of Business Research (23.3%), Industrial Marketing Management (13.7%), Journal of Retailing and Consumer Services (8.6%), Information & Management (6.6%), and Technological Forecasting and Social Change (6.6%). Such research features less prominently (less than 3%) in other journals, which are not discussed here.

We focus on papers written in English; two non-English papers published in 2015 and 2020 are excluded through a case-by-case investigation. The texts (title, abstract, main text, conclusions, etc.) of the remaining 155 papers are screened. Studies on VCC that are not related to online services are excluded. Here, online services include intelligent network research involving offline service entities (such as autonomous machines or intelligent assistive devices for people with disabilities). The number of excluded papers by year of publication is as follows: 1 (2010), 2 (2013), 3 (2016), 3 (2017), 2 (2018), 1 (2019), 1 (2020), and 1 (2021). Of the 141 remaining papers, four papers are excluded since they do not focus on VCC in online services. Finally, a total of 137 papers constitute the research sample.
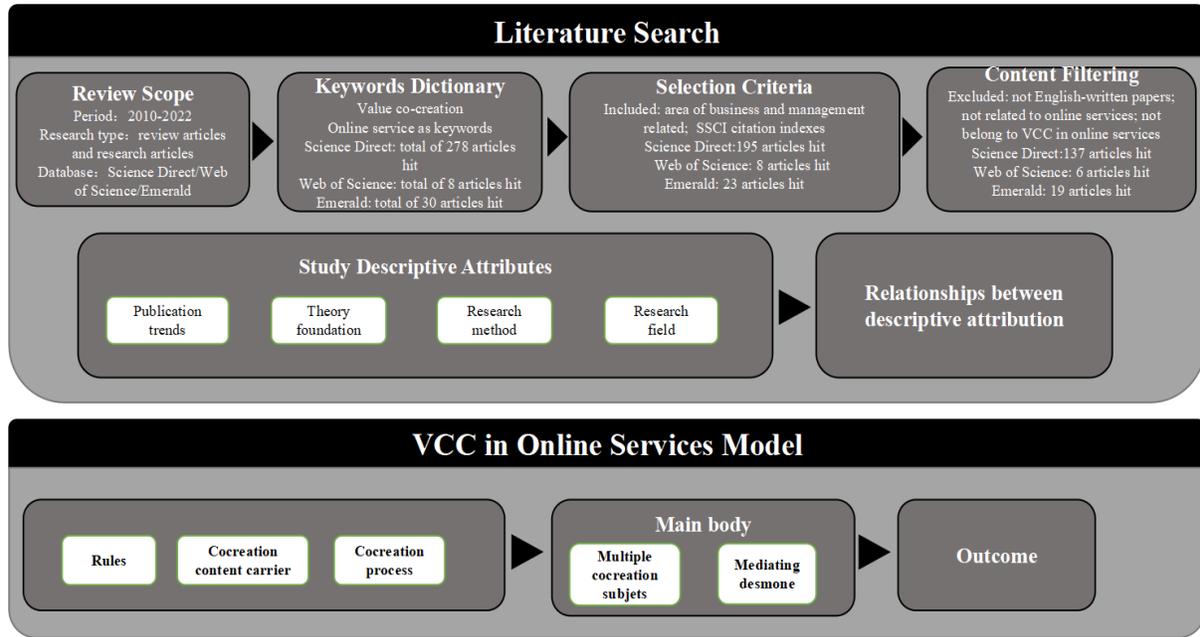
Figure 1: Systematic Review Protocol and Findings

Second, we search the Web of Science database. We choose "value cocreation" and "online service" as the two topics, which should exist at the same time in all articles. After selecting "all years" as the condition for the publication date, we identify 8 relevant studies that have all been published after 2010. Then, eight articles are screened separately via the screening conditions and inclusion/exclusion criteria in the Web of Science database. We excluded the papers are not related to VCC in online services. Finally, 6 papers constitute the research sample.

Third, we search the Emerald database, choosing "value cocreation" and "online service" as abstracts, which should exist at the same time in all articles. After selecting "journal articles" as the article type, we select the period from 2010 to 2022 and choose "all content" as the access type. We identify 30 relevant studies. Next, we check whether all journals in which the studies are published are indexed in the SSCI, for a total of 23 articles. Then, the texts (title, abstract, main text, conclusions, etc.) of the remaining 23 papers are screened. Four articles do not conform to the field of VCC in online services, and two of them focus on the comparative study of different service systems (Edvardsson et al., 2011; 2013). Finally, a total of 19 papers constitute the research sample.

4.2. Selection of Theoretical Lenses

4.2.1. Summary and Description of Key Theoretical Lenses

The review of the literature on online VCC reveals that many scholars have used the perspective of service-dominant (S-D) logic. Service science played a guiding role in many industries, such as management, art, and design, and has been applied to new industries such as service management and service consulting as a service logic integrating science, art, and management. Additionally, the S-D logic strategy is mentioned to illustrate and describe the origin of organizational competitive advantage and participation in creating value with the guest (Karpen & Lukas, 2012). According to S-D logic, we could further focus our research perspective on online services between e-commerce platforms and virtual community services composed of different manufacturers, agents, and customers. Table 1 presents the details of the theoretical lenses.

Table 1: Key Description of Theoretical Lenses

Theoretical lens	Description	Authors
S-D logic strategy	In a social/cultural or economic activity, the event organizer or business focuses on the whole process of providing appropriate services.	Rust and Huang (2014); Koskela-Huotari et al. (2016)

Activity theory	An activity system is a complex system in which active subjects/objects jointly complete a task and generate outputs to achieve a certain goal.	Vardaxoglou and Baralou (2012)
Speech accommodation theory	Verbal adaptation occurs when a speaker deliberately adjusts his or her language, such as through a change in speed, a change in pause or pronunciation, or a change in language, to be closer to the words of his or her interlocutor.	Vaerenbergh and Jonas (2014)
Stakeholder theory	A stakeholder is defined as "any person capable of influencing or being influenced by the achievement of organizational goals". An organization's stakeholders are not limited to its customers but also include suppliers, employees, shareholders, and intermediaries.	Rose et al. (2018); Aksoy et al. (2021)
Institutional theory	This theory refers to the problem of institutional innovation in the service ecosystem and how to break, establish, and maintain the institutional rules of resource integration through the efforts of multiple participants.	Koskela-Huotari et al. (2016)
Social media engagement strategies: Adoption process	The implementation of a social media engagement strategy follows a three-phase approach (coordination, cooperation, and coproduction) during the interface of marketing and research and development.	Chirumalla et al. (2018)
Value network analysis	"Value network analysis is about mapping, visualizing, explaining and analyzing a role-based value network to establish the extent and limitations of the value network and the level of examination."	Laakkonen et al. (2019)
Social interdependence theory	Social interdependence theory (Deutsch, 1949; Johnson, 1989) defines competition from a structural and behavioral perspective. The authors believe that the importance of a group is the dependency relation of its members to conceptualize coopetition from a structural perspective, whose results are affected by the actions of others.	Renard and Davis (2019)
Social exchange theory (SET)	SET explains the value exchange and interaction of an action-response exchange system based on rewards. The theory states that actors form direct social interactions, in which four main elements are defined: trust, commitment, reciprocity, and power.	Benitez et al. (2020)
Expectancy theory	This theory describes the process of motivating people to participate in coping with and obtaining cognition and achieving desired behavioral outcomes, including beliefs about or estimates of observations and attributions to past events.	Zhu et al. (2013)
Attribution theory	Attribution is an ex post facto reasoning process with three dimensions: forming a type of attribution (who is responsible for the event?), stability (what?), and control (to what extent?).	Zhu et al. (2013)
Effective use theory	Efficient use theory is a theory of information system design, which is used to represent and present the real world.	Bonaretti et al. (2020)

Social capital theory	Bourdieu (1986) declared that social capital is the sum of actual or potential resources, which ties together the ownership of an institutionalized and enduring network of mutual recognition, i.e., membership in a group.	Cai et al. (2021)
Principal–agent theory	This theory describes an agency relationship, and the mandator's representative works as an agent according to the contract agreed upon by both parties (Eisenhardt, 1989).	Chaney (2019)

Table 1 reports each theory (selected from the identified literature) to summarize the theoretical research on VCC in online services. We find that the interpretation of online service VCC from the perspective of activity theory is more suitable, as illustrated in the introduction section.

4.2.2. Theoretical Lens: Activity Theory

Through the review of the theoretical foundations of studies on this topic, we find that activity theory can better fit the research field and can explain online VCC. Activity theory was first proposed to state that human interaction with society is accomplished through the tools and symbols in semiotics (Vygotsky, 1978). Activity theory emerged in the 1920s to 1930s (Engestrom, 2001) and it provides a comprehensive and detailed theoretical basis for describing the development process of human activity in technological and social contexts (Kaptelinin et al., 1999, 2013), focusing on the interrelationships among people, artifacts, and subjects (Duignan et al., 2006). Activities are the process in which human beings exchange ideas and spread culture through social interactions with the outside world, as proposed by Kaptelinin (2013). Activities are regarded as a whole system in which members interact with each other over time. Figure 2 depicts the activity system model raised by Engestrom (2015), which can clearly describe how different members of an activity interact and produce results. This model can therefore be used to explain the interaction of systems in terms of activities. In summary, it is not difficult to find that among all the descriptions of the theoretical basis, the central idea of activity theory is consistent with the research question and motivation of VCC in online services in this paper.
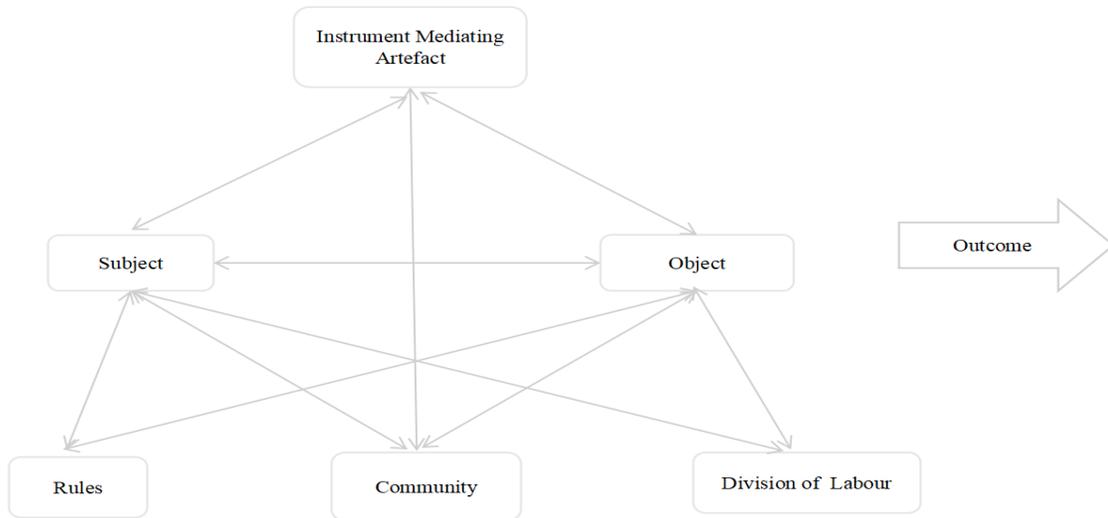

Figure 2: The Activity System Model (Engestrom, 2015)

4.3. Description of the Research Method

Following the full-text screening, we summarize the research methods, authors, and years of publication to present the trends in the research methods used in these studies. Among the qualitative research methods, the top three are case studies (10 papers), interviews (2 papers), and surveys (1 paper). Among the quantitative research methods, the most common methods are surveys (3 papers) and experiments (3 papers). Among the mixed methods, case studies (3 papers), surveys (3 papers), interviews (2 papers), and text mining (2 papers) are the most popular methods.

4.4. Main Research Field

Through a literature review and analysis, it is found that VCC in online services is related mainly to different fields and has several common VCC characteristics. Prahalad and Ramaswamy (2004) proposed VCC, that is,

enterprises and customers jointly creating consumption experience value, for the first time. Bettencourt et al. (2014) proposed that value is jointly created by enterprises and customers. The connotation of VCC has changed from the transaction value of the traditional commercial market to the brand value (enterprise/ manager) and customer value (experience value) formed in the process of cocreation interaction. Therefore, from the perspective of value connotation, we summarize and analyze the two categories of brand value and customer/experience value. Moreover, the main VCC initiators/participants are distinguished, and VCC incentive measures in online services are summarized from the perspective of the supply-demand relationship identification of VCC activities.

Appendix A reveals the basic research question—what are the research methods, theoretical foundations, and research fields of VCC in online services? In addition, it is worth mentioning that online services can be divided into various forms—B2B, business-to-consumer (B2C), and consumer-to-consumer (C2C)—according to different service subjects/forms of VCC activities. The essential differences among these forms lie in the differences among VCC beneficiaries. Appendix A shows that any research field can be a different form of B2B, B2C, and C2C. From the perspective of the difference between supply and demand, there is expert service (supplier) and customer service (demander). Expert service builds an expert database with the help of a third-party service platform/community to provide customers with reliable evaluations or comments. For instance, in reviewing the research area (Raguseo et al., 2015) mentioned in Appendix A, the comment section can be the evaluation or suggestions provided by experts. Customer service involves a large range of concepts, and any online service can have a special customer service channel to satisfy customer demands. However, a customer is considered an expert when he/she is an experienced authority customer and provides services to other customers in the community. Assiouras et al. (2019) studied VCC in customer citizenship behavior, which refers to VCC between customers, to increase the revisit rate and purchase intention of customers through customer assistance and customer feedback. With the emergence of C2C digital platform information, Peltier et al. (2020) developed a platform called the digital information flow connector that includes all enterprises and external providers in B2C/C2C digital communication.

In addition, regarding the study of VCC, it is necessary to clarify its relationship with value codestruction (VCD), which occurs when a VCC activity is affected by a change in the priority environment (such as a pandemic) and a loss of cocreator benefits. When the service environment is destroyed (such as VCD caused by the coronavirus disease 2019 (COVID-19)), the implementation of VCC is a service recovery strategy transforming from VCD (Assiouras et al., 2022). In other words, VCC is the implementation process from VCD to service recovery. Furthermore, Li and Tuunanen (2022) pointed out that in the service system, VCC and VCD realize the resource integration of practices through social interaction mediated by IT.

4.5. Descriptive Findings of VCC in Online Services based on Activity Theory

The descriptive findings of the review of studies on VCC in online services are presented below.

4.5.1. Cocreation Subjects

Studies have indicated that instead of assigning one participant as an innovator or producer and the other as an adopter or consumer, all participants are brought together as resource integrators, serving as a key part of the innovation process (Vargo et al., 2020). Therefore, the subject and object cannot be distinguished. We could refer to participants as multiple cocreation subjects instead of a subject and an object. Through the literature review, we identify the following categories of VCC subjects or resource integrators (see Table 2): (1) experts, (2) users, (3) governments/citizens, (4) consumers/customers, (5) sellers, (6) companies/merchants, (7) social organizations, (8) designers, (9) developers/suppliers, (10) researchers/readers, (11) tourists, and (12) patients.

Table 2: Multiple Cocreation Subjects of Online Services

Year of Publication	Multiple Subjects	Title
2011	government; citizen	Toward a deeper understanding of services marketing: the past, the present, and the future
2011	music company; customer	Music marketing: A history and landscape
2013	platform owner; app developer; demander	Appealing to Internet-based freelance developers in smartphone application marketplaces
2015	company; customer	Co-creating e-service innovations: theory, practice, and impact on firm performance

2015	tourist company; customer/ recommender	Why do travelers trust TripAdvisor? Antecedents of trust towards consumer-generated media and its influence on recommendation adoption and word of mouth
2017	researchers; readers	Popular research topics in marketing journals, 1995–2014
2017	hotel company; customer; service provider	How small hotels can drive value their way in info mediation? The case of 'Italian hotels vs. OTAs and TripAdvisor'
2017	tourism company; tourist	Content mining framework in social media: a FIFA World Cup 2014 case analysis
2017	tourism company; customer; service provider	Shared experience in pre-trip and experience sharing in post-trip: a survey of Airbnb users
2018	stakeholder of water resource management; citizen	Citizen science and low-cost
2019	merchant; customer	The service-dominant logic perspective for enhancing the e-commerce of wine - a test/application on the Italian wine sector
2019	company; online customer community	A principal-agent perspective on consumer co-production: crowdfunding and the redefinition of consumer power
2020	companies	Industry 4.0 innovation ecosystems: an evolutionary perspective on value cocreation
2020	merchant; customer	Understanding the value process: value creation in a luxury service context
2020	supplier; developer; customer	Creating value in product service systems through sharing
2020	service provider; customer	What can I(S) do for you?" How technology enables service providers to elicit customers' preferences and deliver personalized service
2020	digitally connected services (DCS) vendor; customer	DCS: Improvements through customer-initiated feedback
2021	government/citizen	The citizen-led information practices of ICT4D in rural communities of China: A mixed-method study
2021	companies	Et-moone and marketing relationship governance: the effect of digital transformation and ICT during the COVID-19 pandemic
2021	healthcare providers; patient	The future of sleep measurements: a review and perspective

In Table 2, multiple closely related interest subjects jointly participate in cocreation activities and have common expectations for the goal; the difference is that the multistakeholder initiator is different. The initiator can be the enterprise (managers)/experts who provide the service or the customer who has the demand. Therefore, the difference between sponsors is differentiated mainly from the difference between supply and demand.

4.5.2. Cocreation Mediation

Traditional services rely on the material bearing of physical stores, while online services rely on various kinds of cyberspace based on internet technology, which is a nonregional medium for communication between value cocreators and integrators. Thus, the item "instrument mediating artifacts" in the activity system model could be replaced by

cocreation mediation (environment). Through the literature review, we find that the cocreation mediation involved in the process is as follows (Table 3): (1) we-media, (2) community, (3) trading/sharing platform, (4) crowdsourcing, (5) review/company website, (6) self-service machine, (7) service system, and (8) social media. At the same time, the "community" item in the active system model can be understood as the online community (usually directly called the community) and is considered a type of cocreation mediation in online VCC research.

Table 3: Cocreation Mediation in Online Services

Year of Publication	Mediation	Title
2011	virtual cocreation system	Cocreation in Virtual Worlds: The Design of the User Experience1
2013	platform	Appealing to Internet-based freelance developers in smartphone application marketplaces
2015	consumer-generated media (CGM)	Why do travelers trust TripAdvisor? antecedents of trust towards consumer-generated media and its influence on recommendation adoption and word of mouth
2017	knowledge-sharing platform	Popular research topics in marketing journals, 1995–2014
2017	Twitter	Content mining framework in social media: a FIFA World Cup 2014 case analysis
2017	tourism platform	Shared experience in pre-trip and experience sharing in post-trip: a survey of Airbnb users
2018	social networking site	One does not simply meme about organizations: exploring the content creation strategies of user-generated memes on Imgur
2019	e-commerce of wine website	The service-dominant logic perspective for enhancing the e-commerce of wine - a test/application on the Italian wine sector
2019	B2B platform (social media)	Developing business customer engagement through social media engagement platforms: an integrative S-D logic/RBV-informed model
2019	crowdsourcing platforms	Social interdependence on crowdsourcing platforms
2019	e-health community	The promise of precision population health reducing health disparities through a community partnership framework
2020	platform	Industry 4.0 innovation ecosystems: an evolutionary perspective on value cocreation
2020	website	Understanding the value process: value creation in a luxury service context
2020	PSS	Creating value in product service systems through sharing
2020	customer service system (CSS)	"What can I(S) do for you?" How technology enables service providers to elicit customers' preferences and deliver personalized service
2021	WeCountry (IPWS)	The citizen-led information practices of ICT4D in rural communities of China: a mixed-method study
2021	data management platform	The future of sleep measurements: a review and perspective
2021	logistics network system	Strategic development of third-party logistics providers (TPLs): "going under the floor" or "raising the roof"
2021	innovation collaboration system	Smart cities financing system: an empirical modeling from the European context

The above summary of cocreation mediation not only has common points and connections but also has slight differences. One common point is that all of the instances of such mediation are media connecting multiple VCC subjects and play the role of a bridge promoting the exchange and communication among the main bodies of value. What distinguishes them is whether the main goal of these media is to pursue benefit, such as trading platform/company website/crowdsourcing for those whose core purpose is direct to a transaction; however, to provide a communication platform to share personal experience as the main goal, marketing is an indirect achievement like creating brand value, such as we-media/community/sharing platform/reviewing/social media.

4.5.3. Cocreation Content Carrier

In the online service mediator environment, users who participate in their online communities can convey information via a type of communication called memes (Kietzmann et al., 2011). Researchers studied memes generated on social networking sites, revealing how user-generated content conveys the meaning of an organization and how the public expresses meaning through memes, with the aim of providing insights regarding the user-generated brand experience based on the meme family. Consumers may use communication strategies such as humor to demonstrate their dissatisfaction/satisfaction with and preference for the organization (Brubaker et al., 2018). Thus, enterprises should encourage customers to participate in new product development to improve service product innovation, especially in software companies (Di Tollo et al., 2015). Table 4 reports the VCC carrier of online services.

Table 4: Cocreation Content Carrier of Online Services

Year of Publication	Carrier	Title
2017	WOM content	How small hotels can drive value their way in info mediation. The case of 'Italian hotels vs. OTAs and TripAdvisor'
2017	WOM content	Content mining framework in social media: a FIFA World Cup 2014 case analysis
2018	user-generated memes	One does not simply meme about organizations: exploring the content creation strategies of user-generated memes on Imgur

Table 4 shows that word-of-mouth (WOM) content (reviews on different platforms) and user-generated memes are the main cocreation content carriers; when subjects communicate with each other through the mediator, they need to use certain forms of carriers to spread their intentions and ideas. WOM content and user-generated memes have in common that they are both carriers that can transmit information. The difference is that they have different audiences. WOM content is the value creator's sharing of experience or feelings on the platform for all the users to watch at a later time, while user-generated memes are the direct-communication content carriers among the value interaction subjects.

4.5.4. Rules

One study on care services in dairy farming with automatic milking systems pointed out that interactions among subjects (farmers), objects (cows), primary intermediary artifacts (milking robots, etc.), and communities (consultants, etc.) have been conducted through intermediary artifacts and tools and rules of agent-community interaction (e.g., norms, work practices, and legislation) (Lundstrom & Lindblom, 2021). Moreover, Engestrom, Kaptelinin, Lundstrom and Lindblom (2015, 2013, 2021) pointed out the division of labor in the activity system model. The rules for the cocreation mediators (online environment such as a community) are quite comprehensive, such as the contract payment in the transaction process, development and service standards, and industry legal norms. Based on the literature review, we find that only one article explicitly mentioned a description of VCC rules in online services (see Table 5).

Table 5: Cocreation Rules of Online Services

Year of Publication	Rules	Title
2013	contract terms provided by the supplier; laws and regulations	The impact of ERP partnership formation regulations on the failure of ERP implementations

Regarding the rules in the VCC activities of online services, few studies have focused on e-commerce laws, regulations, and industry regulations. Thus, it is urgent to further standardize and improve the laws and regulations of VCC in online services from the legal perspective and to further strengthen the consensus on the establishment of industrial/enterprise e-commerce associations to promote VCC activities.

4.5.5. Cocreation Process

Chaney's (2019) crowdfunding study highlighted a specific case where enterprises encourage online consumers to fund new projects in the community and participate in coproduction, which includes predesign, production, pricing, communication, and after-sales service. Thus, the "division of labor" in the activity system model refers to the cocreation processes undertaken by both the consumer/user and the provider. Thus, we distinguish between the concepts of the cocreation process and the division of labor in our research. We summarize the cocreation processes involved in the study sample as follows (Table 6).

Table 6: Cocreation Processes of Online Services

Year of Publication	Cocreation Process	Title
2011	pricing	Music marketing: a history and landscape
2014	WOM evaluation	Examining the relationship between language divergence and word-of-mouth intentions
2016	product design	The power of codesign to bond customers to products and companies: the role of toolkit support and creativity
2018	shared decision-making process	Patient cocreation activities in healthcare service delivery at the micro level: the influence of online access to healthcare information
2019	business customer cocreation	Developing business customer engagement through social media engagement platforms: an integrative S-D logic/RBV-informed model
2019	codesign	The assessment of meaningful outcomes from co-design: a case study from the energy sector
2020	communicating and interacting	Creating value in product service systems through sharing
2020	digital configuration service and feedback	Digitally connected services: improvements through customer-initiated feedback

In summary, it can be seen that the common point of the VCC process is that multiple stakeholders are not treated separately and play the same role in the creation process. The difference is that the demand side (such as customers) participates in different modes of value creation. They may either directly participate in the design and pricing of products or indirectly participate in the cocreation process through the exchange of feedback to provide suggestions for enterprise managers to make decisions and improve products.

4.5.6. Factors Facilitating Mediation

After analyzing and summarizing the various elements of the VCC process of online services, we focus on the factors facilitating cocreation mediation to improve the VCC process. Table 7 presents the factors influencing this mediation, as derived in our literature review.

Table 7: Factors Facilitating Mediation

Year of Publication	Factors Facilitating Mediation	Title
2018	IT	Citizen science and low-cost sensors for integrated water resources management
2020	IT	Industry 4.0 innovation ecosystems: An evolutionary perspective on value cocreation
2020	modular interconnected processes	Modular interconnected processes, fluid partnering, and innovation speed: A loosely coupled systems perspective on B2B service supply chain management

2021	IT	Et-moone and marketing relationship governance: The effect of digital transformation and ICT during the COVID-19 pandemic

Table 7 shows that information technology and modular interconnected processes are the main driving factors of mediation. As shown, there are few studies on the factors that promote mediation. Moreover, this consideration addresses RQ2: What are the factors influencing the roles played by VCC mediation?

4.5.7. Driving Factors of the Cocreation Process

We also focus on the driving factors promoting the process of cocreation in the literature to promote the result of VCC, that is, to achieve the common goal of how to better promote the VCC of online services. Table 8 presents the factors that promote the VCC process.

Table 8: Factors Facilitating the Cocreation Process

Year of Publication	Factors Facilitating the Cocreation Process	Title
2011	citizen trust	Toward a deeper understanding of services marketing: The past, the present, and the future
2014	language divergence	Examining the relationship between language divergence and word-of-mouth intentions
2015	e-service innovation	Co-creating e-service innovations: Theory, practice, and impact on firm performance
2015	online interactions	Fostering customer ideation in crowdsourcing community: The role of peer-to-peer and peer-to-firm interactions
2018	interactions	Patient cocreation activities in healthcare service delivery at the micro level: The influence of online access to healthcare information
2018	online service design	Customer engagement behaviors in social media: capturing innovation opportunities
2019	business customer engagement	Developing business customer engagement through social media engagement platforms: An integrative S-D logic/RBV-informed model
2019	mix of cooperative and competitive design features	Social interdependence on crowdsourcing platforms
2020	trust	A meta-analysis of the relationship between customer participation and brand outcomes
2020	customer preference induction	"What can I(S) do for you?": How technology enables service providers to elicit customers' preferences and deliver personalized service
2020	communication; customer feedback; knowledge transfer	Digitally connected services: Improvements through customer-initiated feedback
2021	communication technology	The citizen-led information practices of ICT4D in rural communities of China: A mixed-method study
2021	participant resources	Emergent market innovation: A longitudinal study of technology-driven capability development and institutional work

Thus, we have addressed RQ3, i.e., what are the driving factors that affect the process of online VCC? In summary, the factors facilitating the cocreation process can be divided into three categories. 1) Multiple participant aspects: Cocreators use their personal and social networks to expand the audience of online service cocreation activities, bring new consultation/knowledge (participation resources) to online services, and thereby promote the resource synthesis and development of the focal service system. Meanwhile, positive interactions and trust among cocreators can enhance the smooth development of the cocreation process, and more effective communication can be generated when the language backgrounds of the communication agents are similar. In addition, activity initiators can enhance the possibility of customer participation in the VCC process through customer preference induction. 2) Service marketing: E-service innovation aims to examine the capacity for innovation and the successful implementation of e-service solutions to facilitate the VCC process and enhance enterprise value. In addition, some organizations, such as a crowdsourcing platform, collect innovative ideas from users by establishing a competitive design to promote the VCC process. 3) Technology innovation: The innovation of communication technology can create a better cocreation environment for cocreators and promote the cocreation process. Above all, Section 4.5 discusses the findings of our review of the literature on VCC in online services. Section 4.6 presents the VCC framework.

4.6. Framework of VCC in Online Services Based on the Activity System Model

Lundstrom and Lindblom (2021) pointed out that activity theory has been widely applied in various studies, such as farming with automatic milking systems, the use of mobile learning technology in undergraduate biochemistry studies (Lee et al., 2021a), and English language learning (Nguyen & Habok, 2021).

From the microscopic perspective of biology, any tissue cell can be called a system. Similarly, viewed from a macro perspective, an online service is a human activity based on certain technological means and established in a certain cultural background, namely, an activity system. Both VCC parties interact with each other, providing certain resources to perform value-creation activities to achieve a common goal or a common result. While value cocreators emphasize mainly the synergies of the cocreators, they do not highlight the subject status of one party in the activity system of an online service. Therefore, we introduce "multiple cocreation subjects" in the VCC framework in an online service, instead of "subject" and "object" in the activity system model. Eletxigerra et al. (2018) mentioned that resources are antecedents of VCC activities in the service ecosystem, including provider and consumer networks, and that VCC outputs are in the form of a service (exchange) or resource integration. Based on the research on VCC in the domain of online services from the perspective of the activity system model, we propose a model of VCC in online services (Figure 3).

In this model, multiple cocreation subjects denote two or more subjects. Multiple cocreation subjects interact with each other to achieve a common VCC outcome in online VCC activities and use cocreation content carriers through cocreation mediators to communicate, coordinate, and exchange cultural concepts or ideas, thereby participating in the value cocreation process. The main elements of cocreation activities—the cocreation of multiple subject and mediation—mutually influence each other, and their interaction processes are restricted by certain conditions, including rules, cocreation content carriers, and cocreation processes. The activity system model for VCC in online services includes the results of the activity system as a whole; that is, the objects generated by related online VCC activities are converted to outputs, which include service exchange and resource integration. This creative activity continues to evolve over time. We explain the process from the perspectives of elements and processes, how the VCC process unfolds, and what factors promote the VCC process among cocreators.
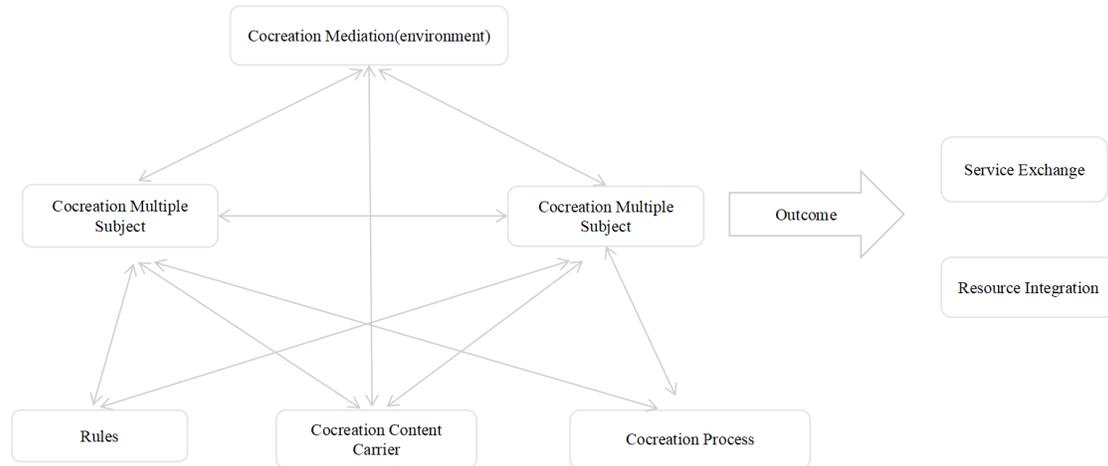
Figure 3: Value Cocreation of Online Services based on the Activity System Model

We address RQ1: What constitutes the main framework of VCC in online services from the perspective of activity theory? Lundstrom and Lindblom (2021) declared that multiple cocreation subjects and the cocreation mediation environment form the main body of the VCC process of online services.

5. Conclusions and Future Research Directions

This study has below contributions:

First, in addition to the classification and summary of all elements in the VCC model of online services, we systematically summarize the categories of these elements, as shown in Appendix B. This research is thus the first attempt to systematically review the research content of VCC in online services, and its proposal concerning all the elements of VCC in online services provides a basic theoretical framework for subsequent academic research. Second, the applied combination of activity theory and VCC in online services provides a new theoretical perspective for further research in this field. Third, this paper constructs an initial VCC model in online services based on the activity system model; it builds the foundation for this model and opens specific and salient research paths for subsequent researchers to explore.

As a summarizing, 1) Based on the theoretical framework of VCC in online services, cocreation drives the cocreation process through pricing, product design, word-of-mouth evaluation, and customer feedback. In the tourism/accommodation industry, the transformation and output of tourists' participation resources across review websites/social media and the information sharing of homestay experiences on Facebook discussion groups are realized by the WOM effect of guests, which allows the expansion of marketing to other potential customer groups. Notably, regarding cocreator WOM evaluation, how to identify the authenticity of evaluation and the extent to which such evaluation promotes or inhibits cocreation activities is a topic that merits further research. Moreover, we call for increasing the understanding of the forms of participation in the VCC process, such as VCC in online clothing shopping and online games (Vardaxoglou, &Baralou, 2012); this could encourage cocreators to participate in the design of such products or games. We have also shown that the driving factors of the cocreation process include trust, competition and cooperative design, customer preference induction, service design and innovation, and interaction and communication. We highlight the concept of "citizen's trust", which facilitates the cocreation process (Kunz, & Hogrefe, 2011); the visualization of information is also an important means to increase the degree of trust. In addition, collaboration and competitive design can facilitate the implementation of cocreation processes (Davis, 2019). To give full play to the initiative, the establishment of volunteer associations is needed. In tourism, an online tourism volunteer association is a new type of organization that promotes mutual help among cocreators and further influences their insight into tours and improves decision-making. Moreover, in practice and design-thinking, it is better to accelerate the functional improvement of the product service system (PSS), which has previously been mentioned in our research field (Akbar, &Hoffmann, 2020), to realize the integration of transactions, preliminary consultation, and after-sales service information platform construction. Therefore, from the summary, it can be concluded that value cocreators should be encouraged to participate in the cocreation process through communication, interaction, and feedback and to explore the resources and preferences of participants and enhance the degree of trust from different cultural backgrounds to realize the cocreation of resources and services.

2) There are few studies related to identifying the driving factors of mediators, which could be an important way in which to achieve positive cocreation results. Considering the mediator factors, most of such studies take IT as the key technical support tool; however, we call for enhancing the technological revolution of IT from the perspective of technology developers, and for further improving cross-platform information sharing to achieve a high degree of zero-distance unity of information in cyberspace. In addition, value creation partnership maintenance and the remedies of VCC in online services have not been studied in the literature; Thus, we call for improving the effectiveness and precision of customer management systems (CMSs) to target participants＇ preferences and characteristics to incentivize them to become more deeply involved in the cocreation process. Additionally, we call for the development of the adaptation of decision support systems (DSSs) conducive to the scientific decisions of enterprise managers in various VCC fields of online services and the advocating for the application of knowledge sharing systems (KSSs) that promote information transparency among cocreators for their trust in cocreation activity. Moreover, the improvement of the community for multisubject knowledge learning and decision-making processes, such as the formation of a functional partition module in the e-health community to realize the different functions of experience exchange and decision-making processes, should be accelerated (Osei-Frimpong et al., 2018), while the community brand relationship should be maintained, and the depth of the cocreation process among value creation partnerships should be increased (Weijo et al., 2019). We recommend that a VCC community of fan-star-brand actors should be constructed to promote the two-way dynamic cycle of brand effect (BE) and celebrity capital. Fan communities gradually transform into production organizations under the double traction of social media platform rules and strong emotion toward idols to enhance and expedite the establishment of value between brands and celebrities.

3) There are few studies on VCC rules, and there is a lack of description of the regulations/laws/restrictions for specific industries and enterprises in online services. E-commerce supervision platforms should clarify the relationship between power and obligation and reduce the degree of the differences that exist in transactions related to VCC in online services in terms of legal considerations. In addition, this review reveals that relevant research on the outcomes or output is missing because the result of the proposed model is the exchange of services or resources without further details. Therefore, future research should consider these aspects.

4) The concept lacks social value appeal, thereby necessitating a call for the establishment of enterprise culture oriented by social value creation to promote the social welfare of VCC, instead of pursuing only corporate interests. In practice, the government＇s public welfare undertakings to promote social welfare should display educational content on energy conservation on the public website of the KSS on urban energy management (Cockbill et al., 2019) and collect the selection of online works on energy conservation and environmental protection among all citizens so that people can become image ambassadors and enhance their motivation for VCC to promote the high unity of residents' healthy life and green energy conservation of the social environment.

5) From the company perspective, there are no concerns about the research on VCC between the company and employees. As most of the research is aimed at considering how customers create value in the participation process, future research can be carried out on how companies and their employees create value during the online service process. During this period, the sharing platform of the information management system is built to realize information fairness and transparency among different members of the enterprise and further strengthen the confidence of employees to participate in the construction of VCC.

6) It is essential to integrate digital information flow that can combine all participants, such as experts, sellers, and buyers, so that information is more direct and transparent for consumers, thereby increasing trust in new platforms. Moreover, from the practical perspective, we should focus on the construction and improvement of third-party platforms to create more channels for the sharing of experience or suggestions for multiple subjects of VCC, such as tourism review websites and expert consultation service platforms, which can better promote value realization. Platform merchants can also adopt online product trial promotion strategies to promote consumer ratings of products, thereby increasing buyer and seller interaction and value creation (Shi et al., 2023). Meanwhile, based on the influence of online product information order on customer persuasion, marketers should develop and implement targeted online product communication plans (Dong et al., 2022).

7) VCC realization in the context of VCD is a very essential topic in both academic research and practical processes, and social interaction and resource integration based on IT can promote VCC realization (Li, & Tuunanen, 2019). The author suggests that scholars pay attention to how to integrate VCC and VCD in service/business systems, that is, to conduct strategic analyses in specific case studies. Moreover, the literature review finds that more scholars have paid attention to the management/strategy level, while few scholars have studied the extent of IT's contribution to VCC and VCD, that is, how to reflect and measure the positive/negative role of IT and promote its positive function in empirical research. Furthermore, how to address the failure of VCC is also a related topic that needs to be explored further.

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APPENDIX

Appendix A. Key Findings of the Research Field of VCC in Online Services

Theme	Description	Brand value	Customer/Experience value	Participants		Authors
				Initiator: enterprise	Initiator: customer	
e-Health	Research shows that preconference information search increases service participation and interaction and enhances provider-patient orientation in a shared decision-making process (Osei-Frimpong et al., 2018). Patients' service ecosystems were developed to promote patient health through technology and, consequently, community well-being from the perspective of patient ecosystem management (Gallan et al., 2019). For the e-community, the e-health gap can be reduced by building a framework for community partnerships (Kuo et al., 2019). Other researchers have discussed the popularity and functions of EHRs and explored the views of pediatricians toward EHRs through questionnaires and practical surveys (Temple et al., 2019).		√	enterprise/customer		Osei-Frimpong et al. (2018); Gallan et al. (2019); Kuo et al. (2019); Temple et al. (2019)
Accommodation-sharing platform	Artificial intelligence (AI) technology could be the solution to service encounters of accommodation-sharing platforms. Li et al. (2021) devise a model for identifying the factors associated with AI technology-infused service encounters. The outcomes of the research provide valuable insights for theoretical advancements and practical implications in the domains of AI application.	√		enterprise/customer		Li et al. (2021)
	A Chinese accommodation-sharing platform was examined to analyze online customer reviews (Liu et al., 2021). It was found that customer experience is related to two factors: the physical environment and human interaction.		√		customers	Liu et al. (2021)
Smart hospitality ecosystem	This study introduces future smart hotel enterprises and proposes a smart hotel ecosystem that adds value for stakeholders by connecting smart tourism networks and sensors to help collect external information and deliver context-based promotion information.	√		enterprises		Buhalis and Leung (2018)
Online music service	This study provides a systematic exposition of music marketing, describes the current state of the music marketing industry, and changes in the context of the rapid development of online music.	√		enterprise/customer		Ogden et al. (2011)

Industry: industrial engineering; industrial ecosystem; manufacturing industry	Koskela-Huotari et al. (2016) redefined the roles of relevant actors and resources within the service ecosystem in manufacturing and traditional services, aiming to establish an industrial ecosystem integrating small and medium-sized enterprises and realizing resource sharing and VCC in the community. Benitez et al. (2020) examine the knowledge-creation process's mediating role, focusing on socialization, externalization, and internalization in the context of Taiwan's manufacturing and service industries (Kao & Wu, 2016). Meanwhile, Chirumalla et al. (2018) highlight the impact of social media on marketing and R&D interfaces within the manufacturing industry, supported by a multicase study involving two manufacturing companies.	√		enterprises		Koskela-Huotari et al. (2016); Kao and Wu (2016); Benitez et al. (2020); Chirumalla, Oghazi and Parida (2018)
Game brand community	By analyzing the semantics of players in online game communities, Vardaxoglou and Baralou (2012) declared that developers can make players participate in the development of game platforms, thus innovating game applications and transforming them into immersive world applications.		√	enterprise (game developer)/customer		Vardaxoglou and Baralou (2012);
	Based on the theoretical model of brand community response, Weijo et al. (2019) provided new insights into consumers' brand transgression coping, brand relations, and cocreation between brand communities and marketers in a video game brand community.	√	√	enterprise/customer		Weijo et al. (2019)
Service system	In terms of modular DSIT mode, the conceptual service design framework was discussed by Wang et al. (2017); the value creation of PSS was analyzed through a meta-analysis (Akbar & Hoffmann, 2020).	√	√	enterprise/customer		Wang et al. (2017); Akbar and Hoffmann (2020)
Energy sector: water resource management-sensor networks	The collaborative design process for an energy prototype system was introduced and showed how collaborative design can generate valuable insights for future "information-intensive" design and the development of meaningful content (Cockbill et al., 2019). Some scholars assess water resource management systems, mentioning that citizens and stakeholders participate in integrated water resources management and use sensor and networking technologies to reduce costs and increase data coverage, especially in remote, water-scarce areas (Paul & Buytaert, 2018).		√	enterprise/citizen		Paul and Buytaert (2018); Cockbill et al. (2019)

Forest leasing value network	Laakkonen et al. (2019) discussed how the opportunities for the exchange and integration of intangible resources in partner networks allow for the design of new types of forest services and suggested that forest owners participate in the value-creating activities of forest services, to enhance the impact of forest services.	√		enterprise/forest owner		Laakkonen et al. (2019)
Virtual retail	In the context of Italian wineries, Festa et al. (2019) reveal that the transformation of social network users into social commerce users holds strategic importance for wine e-commerce. Additionally, the study shows that all social and economic actors act as resource integrators, and that the value generated is always determined by the beneficiary.	√	√	enterprise/customer		Festa et al. (2019)
Luxury service	Based on an empirical study of how stakeholders engage in creative activities in a value-deprived cocreation environment, this study analyzed the process of joint and separate activities between provider and customer in terms of value. First, it proves that the service provider's role goes beyond simply value cocreation; second, it describes how the customer creates value independently of the provider; and finally, it regards escapism as a vital segment of customer value on luxury services websites.		√	Enterprise/customer		Holmqvist et al. (2020)
Service supply chain	It proposed a loosely coupled system of supply chain concepts in the B2B market. It also explains how modular dialectical elements in the standard process and interface content interface (SPCI) and structured data connection (SDC) support information sharing via mobile partnerships in the service supply chain, increasing the speed of innovation. The results based on samples of service firms show that mobile partnerships improve the quality of information.	√		enterprises		Acharya et al. (2020)
Crowdsourcing	Companies are increasingly involving customers in idea generation to maintain their competitive edge. It conducted an empirical study on the characteristics (i.e., the customers' online peer-to-peer (P2P) networks and point to the direction of the firm (peer to firm (P2F))), interaction, scale, and intensity released by the customer in past idea efforts (i.e., participation) (Chan et al., 2015). Renard and Davis (2019) explained that crowdsourcing user behavior showed that a mix of collaboration, cooperation, and competitive design characteristics positively influence the creative process and drive the essence of competition.		√	enterprise/customer		Chan et al. (2015); Renard and Davis (2019)
Crowdfunding	Crowdfunding is a method to help enterprises finance new projects by using online consumer communities. Chaney (2019) studied the	√	√	enterprise/customer		Chaney (2019);

	agency relationship in cooperative production; that is, the company entrusts part of the production process to consumers and empowers them in terms of funding sources, project approval, and community management. Consumers jointly decide whether to put the product on the market. Cai et al. (2021) illustrated the development of crowdfunding activities and the influence and performance of external and internal social capital on crowdfunding activities.					Cai et al. (2021)
Reviewing	Searching hotel review data on third-party intermediaries such as online travel agents (OTAs) and TripAdvisor is more effective for finding customers' attitudes and catering to their requirements to improve market share (Raguseo et al., 2015). The method of SMM could be used to classify Twitter content using tourism services ontology (hotels, restaurants, and transportation) to identify hot topics on social media (Thomaz et al., 2017). Therefore, the third-party service platform should pay attention to the impact of cultural values on customer expectations, so as to better meet customer needs.	√	√	enterprise/customer		Raguseo et al. (2015); Thomaz et al. (2017); Wan et al. (2023)
VCD and service recovery	Assiouras et al. (2022) emphasized that during the mass disruption of services (such as COVID-19), the dislocation of practices will lead to VCD, while the unity, common intention, and altruistic thinking of participants can promote VCC realization; Dimitrios et al. (2020) studied the dark side of VCC in the case of Airbnb, in which the local people will lead to VCD when losing their benefit; Sahaym et al. (2022) proposed the conditions leading to VCD such as opportunism and asymmetrical power when studying the potential mechanism between central and complementary enterprises in the study of the IT ecosystem. Zhang, A. et al. (2022) make a significant contribution to the field of online service recovery by introducing a novel concept called technology-driven mandatory customer participation (MCP), a crucial strategy for service recovery. This new construct sheds light on innovative approaches to engaging customers in the recovery process.		√	enterprise/citizen/customer		Dimitrios et al. (2020);Assiouras et al.; Sahaym et al.; Zhang et al. (2022)
Customer empowerment	Customer empowerment can lead to increased value under certain circumstances; Harrison and Waite (2015) illustrated how customers perceive and experience VCC from participation in service co-production.		√		customers	Harrison, T. and Waite, K. (2015)
VCC incentive measures	Step 1. Identification of supply and demand relationship of participants (demanders and suppliers) Step 2. For demanders: In medical self-service, Zainuddin and McCoske (2016) proposed that managers should start with customers' consumption experience (behavioral contribution) and behavioral intention (cognitive contribution) to promote customers' self-creation activities. In online health communities (OHCs), according to Zhao et al. (2015), the likelihood of an OHC member identifying with a					

specific OHC and engaging in value cocreation activities therein is influenced by factors such as kindness, trust, shared vision, and shared language. These elements play a crucial role in fostering a sense of belonging and active participation within an OHC.
 Step 3. For suppliers: Priharsari and Abedin (2021) pointed out that the company (sponsor), as the provider of cocreators, should facilitate VCC activities by facilitating the mobility of the online community (including consensual and boundary changing), while moving from the sponsor role to the facilitator role. Kautish and Sharma (2019) addressed that e-retailers could add value to VCC activities by offering shopping assistance to customers through product categories.

Appendix B. Categories of Elements of VCC in Online Services