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Article

Investigating Value Co-creation in Crowdsourcing: The Revelatory Case of the Shield

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Abstract: As a typical form of value co-creation, crowdsourcing has been increasingly applied by firms to generate business value. By engaging a crowd, a platform, and other stakeholders, a crowdsourcer can foster the co-creation of a portfolio of value for diverse stakeholders. In analyzing the value co-creation in crowdsourcing, we propose a framework by combining the theories and frameworks in value co-creation and crowdsourcing. The framework examines the key stakeholders, joint purpose, engaged value co-creation processes, contributions, bidirectional relationships of the engagement, and perceived value, exhibiting a holistic view of the value co-creation in a crowdsourcing project. Results of the analysis reveal the business performance of the crowdsourcing project and identify areas of improvement regarding business sustainability. This is a major theoretical contribution of this study. The research design applied a case study approach to empirically investigate a crowdsourcing project. Both the theoretical and practical implications are discussed.

Keywords: crowdsourcing; value co-creation; business sustainability; stakeholder

1. Introduction

Web 2.0 technologies make it possible for users to generate abundant content that can be viewed and communicated by massive people around the world virtually in an instant. Such unparalleled reach has been leveraged by firms to supplement traditional ways of sourcing, i.e., crowdsourcing [1]. According to Howe [2], crowdsourcing refers to outsourcing a task to a group of ex-ante unknown individuals in the form of an open call. It is an umbrella term that covers diverse applications, such as micro-sourcing, microtasking, online tournament/contest, open-source software (OSS) development, crowdfunding, and crowd voting [3].

Crowdsourcing is a type of value co-creation [4]. A typical crowdsourcing initiative involves multiple stakeholders to co-create value [5]. The extant literature on crowdsourcing commonly identifies three major ones, including a crowdsourcer, crowd, and platform [1, 6, 7]. A crowdsourcer is the demand side who calls for individuals to complete a crowdsourced task. A crowd is the supply side, consisting of a group of ex-ante unknown individuals who may voluntarily undertake the crowdsourced task. A platform act as the intermediary that connects the crowdsourcer and crowd by offering technological and managerial services. From the crowdsourcer's perspective, hosting a crowdsourcing initiative inevitably impacts the newly engaged stakeholders as well as some existing stakeholders [3, 8]. Ideally, all involved stakeholders should benefit from the engagement [9]. Nevertheless, since stakeholders hold different stakes, the crowdsourcing initiative may create value for some stakeholders while it does not create or even destroys value for others [10]. Therefore, it is necessary to include a value co-creation lens in analyzing the business performance and sustainability of a crowdsourcing project. This calls for a series of concerns, including the involved stakeholders, joint purpose, major contributions,

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relationships of engagement, and portfolio of value. In this study, we address these issues by proposing an integrated framework for the value co-creation analysis in a specific crowdsourcing initiative. Results of the analysis exhibit a holistic view of the crowdsourcing project from the lens of value co-creation, which reveals the business performance and identifies areas of improvement regarding business sustainability.

The rest of the paper is structured as follows: we first present the reviews on value co-creation and crowdsourcing, which is followed by the discussions on the theoretical backdrops and elaborations of the proposed framework; then, a revelatory case study is presented to illustrate how the proposed framework is applied in practice; finally, the theoretical and practical implications, limitations, and research agenda are discussed.

2. Literature Review

2.1. Value Co-creation

The trending phenomenon of value co-creation designates the process where the focal entity and stakeholders jointly produce value [11]. The rapid development of information technologies has fueled the switch from value creation to co-creation [12, 13]. Firms no longer rely solely on their internal resources, capabilities, and processes to create value but also engage external stakeholders to co-create value [14]. This blurs the traditional resource boundary of a firm [15], inspiring new ways of doing business, such as strategic alignment, outsourcing, crowdsourcing, and viral marketing.

Value co-creation has been discussed in numerous fields, such as service management, innovation management, marketing, management information systems, and consumer research [11]. While scholars applied different lenses to study the phenomenon, empirical investigations can be categorized into three dimensions: the co-creator, co-creation process, and co-created value [16-18]. Co-creators in a value co-creation initiative include the focal entity that initiates the value co-creation and the counterparts who engage in the joint venture [11]. A counterpart can be a service vendor, consumer, alliance company, competitor, crowd, government, or supplier. According to the stakeholder theory [19], the counterparts are stakeholders of the focal entity as they can affect or be affected by the focal entity through engaging the value co-creation initiative. While stakeholders are not equally involved in the decision-making of the focal entity, their stakes vary and are not always mutually supportive [11]. An activity of a focal entity may create value for one group of stakeholders whereas it may destroy value for another group [20]. Hence, in analyzing the value co-creation of an initiative, an initial step is to identify the major stakeholders. Haksever et al. [10], for example, identify five stakeholders of a private company, including shareholders (owners), employees, customers, suppliers, and society at large. Another stream of literature examined why stakeholders engage in value co-creation, revealing diverse motivations, including knowledge sharing, resources sharing, cost saving, access to experts, marketing excellence, and many others [21-23]. Stakeholders' antecedents and motivations of engagement may vary but converge on a joint purpose [22]. The joint purpose is the foundation of value co-creation.

The co-creation process concerns how value is co-created by stakeholders [24]. According to the resource-based view (RBV), value co-creation essentially is the process where a focal entity extends the resource boundary by leveraging stakeholders' property- and knowledge-based resources [15]. Value, therefore, is generated from leveraging a combination of the existing and newly acquired resources [25]. The relational view regards value co-creation as establishing and leveraging mutual relationships with stakeholders [26]. Value can be generated by investing in shared assets, creating knowledge-sharing routines (i.e., enabling the creation, recombination, and transfer of specialized knowledge), supplementing complementary resources and capabilities, and setting up collective mechanisms for governance [13, 27]. In analyzing a value co-creation initiative, identifying the major value co-creation processes is significant for the focal entity to generate a thorough understanding of how value is co-created.

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The co-created value examines the output of a value co-creation initiative. While the focal entity and its multiple stakeholders co-create value for the focal entity, they also co-create value for the rest stakeholders [28]. The output of value co-creation is a portfolio of value [29]. Ideally, each stakeholder shares a satisfactory portion of value from the portfolio [9]. If value co-creation is not mutually beneficial for all stakeholders, some stakeholders may quit. This would reduce the legitimacy of the established relationships and negatively affect the business sustainability of the focal entity [30]. On this basis, it is significant to discuss co-created value from multiple stakeholders' perspectives and examine whether all stakeholders benefit from the engagement.

2.2. Crowdsourcing

The term "crowdsourcing" was coined by Howe [2]. A widely accepted definition in the literature is presented by Estellés-Arolas and González-Ladrón-de-Guevara [31] (p. 11) who define crowdsourcing as "*a type of participative online activity in which an individual, an institution, a non-profit organization, or company proposes to a group of individuals of varying knowledge, heterogeneity, and number, via a flexible open call, the voluntary undertaking of a task*." The concept of crowdsourcing is not historically new [32]. For example, the 'most wanted' posters had been commonly used by governments to chase pirates during the Age of Exploration in Europe. Nowadays, involving crowds in business processes is becoming increasingly popular [33]. With the help of state-of-the-art information technologies, it is easy and cheap for both individuals and organizations to utilize crowdsourcing [3, 34]. A variety of crowdsourcing applications have emerged, including micro-sourcing, micro-tasking, online tournament, open-source software (OSS), crowdfunding, crowd-voting, and wiki.

Crowdsourcing is a typical case of value co-creation as it involves multiple stakeholders to co-create value [8]. In a crowdsourcing initiative, the crowdsourcer is the decision maker who decides to crowdsource. Scholars reveal some common motivations to crowdsource, including problem-solving, innovation, marketing excellence, and cost reduction [35-38]. The crowd consists of a group of individuals who may voluntarily undertake the crowdsourced task. Individuals' motivations to join crowdsourcing are categorized into extrinsic and intrinsic motivations [39]. Extrinsic motivations can be activated by incentives such as financial rewards, virtual reputation, and career opportunities [39-41]; intrinsic motivations can be activated by incentives such as senses of altruism, pride, and self-satisfaction [40, 42, 43]. Scholars indicate that extrinsic and intrinsic motivations synergize to work, and one may outperform another under certain circumstances [39, 42]. The platform acts as the agency that connects the crowdsourcer and crowd by providing technological and managerial services. In some cases, LEGO Ideas as an example, the crowdsourcer creates its own platform to crowdsource; therefore, the crowdsourcer and platform merge as one stakeholder. In addition, from the crowdsourcer's perspective, initiating a crowdsourcing project may generate significant impacts on the existing stakeholders [3]. For example, an online crowd voting for consumer research can be leveraged to improve consumer experience; a crowdfunding campaign may change the structure of the existing shareholders; an ideation for innovation may pose new requirements to the suppliers. Hence, besides the crowdsourcer, crowd, and platform, it is equally crucial to identify the additional stakeholders who can affect or be affected by the crowdsourcing initiative.

The co-creation processes of crowdsourcing vary in different applications. In general, value can be co-created in a competitive, collaborative, or neutral way [30, 34, 44]. With a competitive mechanism (e.g., ideation, micro-sourcing, and online tournament), individuals in a crowd compete with each other, and a crowdsourcer can select the best ones from a pool of solutions or select the most suitable candidates based on their profiles and proposals to perform the crowdsourced task [45]. With a collaborative mechanism (e.g., wiki, user-generated reviews, and OSS development), individuals cooperate with each other, and a crowdsourcer can benefit from the collective effort of the crowd [46]. With a neutral

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mechanism (e.g., micro-tasking, crowdfunding, and crowd-voting), individuals work independently on simple tasks, and a crowdsourcer can automatically get the crowdsourced task done or aggregate the deliverables as the final output [34]. Moreover, scholars have discussed specific business models in crowdsourcing. For example, Kaganer et al. [47] identified four types of human clouds, namely, the facilitator, arbitrator, aggregator, and governor models. Geiger and Schader [48] elaborated on four archetypes, including crowd rating, creation, processing, and solving systems. In essence, each type in these taxonomies can be categorized into either a competitive, collaborative, neutral, or mixed mechanism. In practice, the co-creation processes of crowdsourcing may combine different mechanisms [49].

The co-created value in a crowdsourcing project is discussed from multiple stakeholders' perspectives. As revealed by He et al. [36], stakeholders may expect different value before their engagement, experience diverse emergent value during the engagement, and realize distinct value after their engagement. From the crowdsourcer's perspective, whether the realized value meets the expectation is significant [35]. From the crowd's perspective, while not all individuals are financially rewarded in most crowdsourcing applications, intrinsic value plays a crucial role to compensate [5, 36]. However, because individuals usually possess weak bargaining power, the engagement is criticized for exploitation if they are not adequately compensated [50]. From the platform's perspective, whether hosting the crowdsourcing initiative creates tangible and intangible value is determined by the service quality, project performance, and feedback from both the crowdsourcer and crowd [7]. In addition, the existing stakeholders of the focal entity may also benefit or suffer from the crowdsourcing initiative. On this basis, in analyzing the co-created value of a crowdsourcing initiative, it is vital to identify gains and losses from each stakeholder's perspective.

3. Theoretical Backdrops and the Framework

The reviews on value co-creation and crowdsourcing pose three fundamental requirements regarding empirical investigations into value co-creation in crowdsourcing. First, the key stakeholders should be identified. Second, the key processes that generate value should be extracted. Third, the perceived surplus between the gained and destroyed value for each stakeholder should be figured out. By fully considering the above requirements, we propose the framework for analyzing value co-creation in crowdsourcing by integrating the work of Freudenreich et al. [28], Haksever et al. [10], and the review on crowdsourcing.

Freudenreich et al. [28] put forward a framework to investigate the sustainability of a business model. The framework identifies financial stakeholders, employees, customers, business partners and societal stakeholders as the major stakeholders, reveals the bidirectional relationships of their engagement, highlights the engagement processes with the major contributions, and exhibits the derived benefits. The results of the analysis attempt to generate a nuanced understanding of the sustainability of the targeted business model. This framework is used as the foundation of the proposed framework. The work of Haksever et al [10]. indicate that a value co-creation initiative may simultaneously create and destroy value for different stakeholders. Three dimensions of value are introduced to clarify co-created and destroyed value, including financial, non-financial, and time. Specifically, financial value is tangible and refers to direct monetary impacts on stakeholders (e.g., revenue, salary, and commission). Non-financial value is usually intangible and depicts non-financial impacts on stakeholders (e.g., reputation, safety, and respect). Time is deemed as the third dimension of value, concerning the speed of access to co-created value, time-saving/consuming, and extension of time horizon (e.g., time to the market, long-term relationship, and R&D lifecycle). Moreover, perceived value best fulfills the needs of this framework because the analysis attempts to reflect stakeholders' perceptions of co-created value. On this basis, the derived benefit is replaced with the perceived value, and we further explain the perceived value by distinguishing between co-created and

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destroyed value in the financial, non-financial, and time dimensions. In addition, we customize the framework by relating the above theoretical backdrops to the review on crowdsourcing.

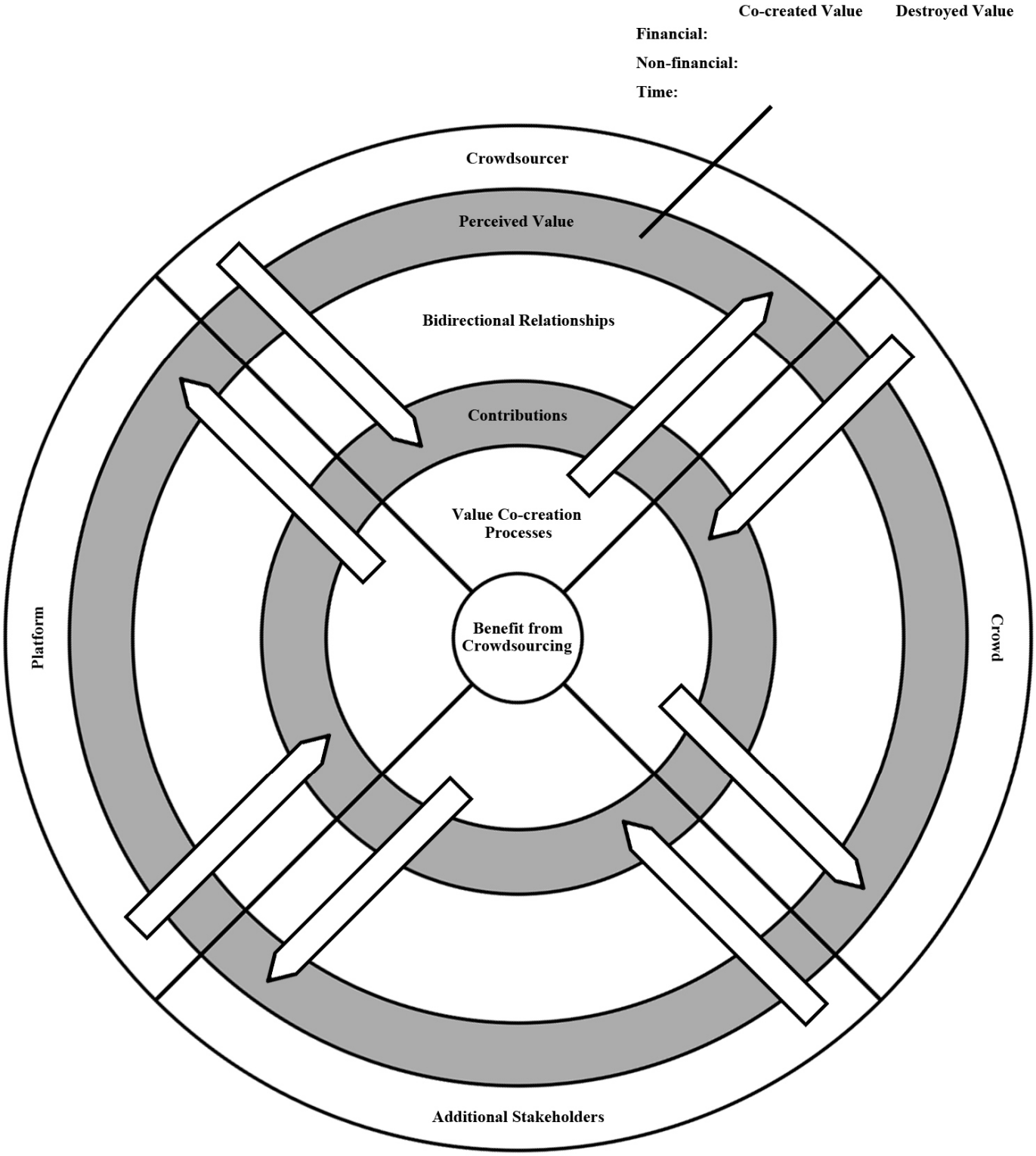

Figure 1. The framework for analyzing value co-creation in crowdsourcing.

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As shown in Figure 1, a center is surrounded by five rings. From the center to the periphery, we refer to the five rings as the innermost, second, third, fourth, and outmost rings respectively. The center represents the joint purpose that drives stakeholders to engage in a crowdsourcing initiative. Although stakeholders hold different stakes and have different motivations, their joint purpose is to benefit from the crowdsourcing initiative. The outermost ring identifies the key stakeholders. In this study, we adopt a broader coverage of stakeholders to include the crowdsourcer (the focal entity), crowd, platform, and additional stakeholders who impact or are impacted by the crowdsourcing initiative. The innermost ring exhibits the key value co-creation processes. The second ring further illustrates the specific contributions made by each stakeholder. The third ring together with the arrows explains bidirectional relationships of stakeholders' engagement. The fourth ring concludes the perceived value, which covers co-created and destroyed value and is categorized into financial, non-financial, and time dimensions. This framework can be applied to empirically investigate the value co-creation in a crowdsourcing initiative by comprehensively unveiling the critical information. Results of the analysis can generate an insightful diagnose regarding the business performance of the project and suggest areas of improvement regarding business sustainability.

4. Research Methods

This study applied a single-case design. According to Yin [51], a single-case design can be used when the case is critical, extreme, representative, revelatory, or longitudinal. This study aims to investigate value co-creation in crowdsourcing. Hence, we selected a critical, representative, and longitudinal case to demonstrate how the proposed framework is applied to analyze the value co-creation in the observed crowdsourcing project. Researchers physically visited the crowdsourcer and observed the entire lifecycle of the crowdsourcing project. Primary data was collected from multiple sources, including direct observations, interviews, and documentation. In line with the proposed framework, the data relevant to the stakeholders, value co-creation processes, contributions, and relationships was collected from direct observations and documentation. The data relating to the joint purpose, co-created value, and destroyed value was collected mainly from interviews (with the crowdsourcer, crowd, and the supplier) and documentation (on the platform and online reviews). The collected data is summarized in Table 1.

Table 1. Collected data.

Stakeholders	Data Sources
The Shield	- Interviews with the owner and the R&D team. - Direct observation of the project. - Online & offline documentation. - Informal conversations.
The Crowd	- Interviews with 10 individuals (three winners included). - Direct observations of the online & follow-up phases.
The Platform	- Direct observations of the online phase. - Online documentation.
The Supplier	- An interview with the manager.
The Consumers	- Online documentation.

5. The Case of the Shield

Established in 2013, the Shield is one of the most successful brands in the local tabletop role-playing game (TRPG) market. In a TRPG, there is a script specifying the scenes, rules of the game, instructions of the items, roles of players, shared and private information for each role, and winning conditions for each role. A group of players sit around a table, acting in different roles, interacting with each other directly, and attempting to win the game. The key business of the Shield is offering one-stop services for TRPG

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players, including providing physical gaming rooms, TRPG scripts, hosting services, and coordination services.

According to the business owner, the signature scripts for TRPGs contributed to the competitive advantage over competitors. The existing scripts came from two sources: copyright purchases from the supplier and internal R&D. The supplier is a well-known gaming company specializing in game designs. It offers a wide range of high-quality scripts for TRPGs. Buying a script is easy and fast; however, it is very expensive, and the authorization is not exclusive so that competitors can buy the same script. In comparison, developing a script internally is relatively cheap and unique; nevertheless, the development process is time-consuming, and the initial quality cannot be guaranteed because there is a lack of feedback from consumers. In addition, the supplier sponsored the copyright transaction program where an internally developed script by the Shield could be transacted to the gaming company. The gaming company decided to acquire the script or not according to the quality assessment. If yes, the copyright of the script would be transferred, and the discounts on future copyright purchases would be given to the Shield.

The owner of the Shield initiated the crowdsourcing project to collect inspiration for script designs and explore crowdsourcing as a new source of R&D. The project consisted of two phases: the online and follow-up phases. The online phase was a one-month-long micro-sourcing on a broker platform. Candidates were required to submit proposals of draft ideas on script designs for TRPGs within the regulated time. The Shield promised to financially reward the best three ideas according to the internal assessment and might further develop the best ideas with the authors. In total, there were 15 individuals participated in the online phase, and three winners were rewarded.

The follow-up phase was initiated after the business owner decided to collaborate with two winners of the online phase. Additional financial rewards were granted, and the winners accepted the offer. For two months, the business owner together with the internal R&D team co-worked with the two winners respectively and finalized the scripts for TRPGs. Later after the crowdsourcing project, one designed script was made available for consumers to play. After about half a year, the Shield participated in the copyright transaction program, transacted one script designed in the crowdsourcing project, and received discounts on copyright purchases from the gaming company.

6. Findings and Discussions

Guided by the framework, as an initial step, the key stakeholders involved in the crowdsourcing project are identified. The Shield is the crowdsourcer who initiated the crowdsourcing project. The agency platform hosted the online phase of the project. The crowd consisted of 15 individuals who participated in the online phase, and two of them participated in the follow-up phase. Two additional stakeholders are included, including the consumers who consumed the designed script and the gaming company who acquired the copyright of the script. Then, we discuss the joint purpose, value co-creation processes, contributions, bidirectional relationships of the engagement, and perceived value from each stakeholder's perspective.

6.1. The Crowdsourcer

From the crowdsourcer's perspective, the Shield expected to acquire inspiration for script designs of TRPGs and explore a new way of R&D. It engaged in the entire lifecycle of the crowdsourcing project. The business owner and the internal R&D team contributed to the governance of the project, including designing the crowdsourcing project, selecting the platform, specifying the requirements, designing the schedule, setting up the rewarding strategies, assessing deliverables, hosting the follow-up phase, transacting with the supplier and consumers, and managing relationships with multiple stakeholders. While governing the crowdsourcing project, the engagement created and destroyed a portfolio of value for the crowdsourcer. In terms of the financial dimension, designing new scripts via crowdsourcing in comparison with purchasing from the supplier was perceived as

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cost-saving. Moreover, one script had been used to generate financial revenues and traded with the supplier for discounts on future purchases. In the meantime, the Shield paid commission fees to the agency platform and financially rewarded the winners of the online phase and co-creators of the follow-up phase. In an analysis of the non-financial value, the business owner valued the inspiration from collected script designs for TRPGs and the gained experience in managing the crowdsourcing project. However, the non-financial resources (e.g., effort, human resources, and energy) invested in the crowdsourcing initiative were categorized as the destroyed value. Concerning the time dimension, the crowdsourcing initiative accelerated the speed from R&D to the market and strengthened long-term relationships with multiple stakeholders (the supplier, platform, two co-creators, and consumers). Nevertheless, the internal R&D team identified time wasted in reviewing some low-quality proposals and coordinating with co-creators as the destroyed value. Overall, the business owner indicated that the Shield benefited from the crowdsourcing project.

6.2. The Crowd

From the crowd's perspective, individuals' engagement was driven by a mix of motivations, including financial rewards, interest, and challenges. There were 15 individuals who engaged in the online phase, and two of them participated in the follow-up phase. The crowd contributed to the project by designing scripts for TRPGs. While working on their designs, the engagement created and destroyed a portfolio of value for the crowd. In terms of the financial value, three winners won financial rewards at the end of the online phase and two of them received additional financial rewards at the end of the follow-up phase. In contrast, a few individuals who did not win any financial reward perceived opportunity cost since they sacrificed the opportunities of winning rewards in other crowdsourcing projects. In an analysis of the non-financial value, all individuals perceived some kinds of intrinsic value, such as fun, challenges, and self-improvement. However, a few individuals perceived negative emotions when they were confronted with difficulties in working on the scripts and failed to win in the online phase. Concerning the time dimension, the two individuals who took part in the follow-up phase had established long-term relationships with the Shield for future cooperation. Moreover, some individuals indicated that they would continue using the platform, which is viewed as strengthened relationships with the platform. Nevertheless, a few individuals felt a waste of time even though they understood the rewarding schemes on the platform. Overall, most of the individuals thought that they benefited from the crowdsourcing initiatives whereas a few believed that the destroyed value offset the co-created value.

6.3. The Platform

From the platform's perspective, hosting crowdsourcing projects is the key business that generates revenues. The platform engaged in the online phase of the crowdsourcing project. The major contribution made by the platform was project management, including connecting the crowdsourcer with the crowd, promoting the project, assisting the initiation, and securing the payment. While hosting and managing the online phase by providing technological and managerial services, the engagement created and destroyed a portfolio of value for the platform. The financial value created for the platform was the commission fees paid by the crowdsourcer. The non-financial value was the positive feedback left by the crowdsourcer and winners of the online phase, which added credit to the services of the platform. However, some individuals who did not win any reward might leave the platform. Concerning the time dimension, the platform had strengthened long-term relationships with some individuals of the crowd and the Shield, facilitating potential retentions.

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6.4. The Supplier

From the supplier's perspective, the gaming company was not actively involved in the online or follow-up phase. The Shield and the gaming company shared a common purpose of acquiring high-quality script designs for TRPGs. The copyright transaction program connected the gaming company to the post-crowdsourcing phase. The major contribution made by the supplier was the transaction of the script designed in the crowdsourcing initiative. By purchasing the copyright, the engagement created and destroyed a portfolio of value for the gaming company. Concerning the financial dimension, the acquired script generated financial revenues at the cost of discounts offered to the Shield. In an analysis of the non-financial value, besides the purchased script, the gaming company claimed that the successful transaction added credit to the copyright transaction program. With respect to the time dimension, the gaming company accelerated the speed of R&D and enhanced a long-term relationship with the Shield.

6.5. The Consumer

From the consumers' perspective, their need for high-quality scripts for TRPGs facilitated the launch of the crowdsourcing project. Consumers were engaged in the pre-crowdsourcing and post- crowdsourcing phases. Their major contributions were posing requirements and providing feedback regarding script designs of TRPGs. By consuming to play the TRPG at the Shield, the engagement created and destroyed a portfolio of value for consumers. Regarding the financial value, consumers paid service fees to play the new game. With respect to the non-financial dimension, most online peer reviews showed positive experiences while a few shared negative experiences. In terms of the time dimension, the crowdsourcing project made it faster for consumers to play the new game and enhanced long-term relationships with the Shield. However, those consumers with negative experiences of playing the game might end up relationships with the Shield.

6.6. A Holistic View

In conclusion, the Shield (crowdsourcer), 15 individuals (crowd), agency platform, gaming company (supplier), and consumers of the Shield are the key stakeholders of the crowdsourcing project. In a broad sense, different stakeholders had diverse motivations, and their joint purpose of the engagement was to benefit from the crowdsourcing project. While stakeholders are actively/passively and directly/indirectly engaged in different value co-creation processes (broadly defined as the pre-crowdsourcing, online phase, follow-up phase, and post-crowdsourcing phases), they established bidirectional relationships, made diverse contributions to the project, and perceived distinct value. Results of the investigations into the co-created and destroyed value in the financial, non-financial, and time dimensions indicate that most stakeholders benefited from engaging in the crowdsourcing project; however, the destroyed value offset or even outweighed the co-created value from a few individuals' and consumers' perspectives. The results of the analysis are summarized in Figure 2. On a business level, the crowdsourcing project is successful because the results satisfied the crowdsourcer's business needs. Regarding business sustainability, ideally, all stakeholders should perceive surpluses between the co-created and destroyed value. Nevertheless, this can hardly be achieved in practice. The results of the analysis point out areas of improvement by revealing the dissatisfied stakeholders with their value perceptions. By focusing on their engaged value co-creation processes, the crowdsourcer could better compensate the stakeholders. For example, the Shield could elaborate more intrinsic value for individuals of the crowd during the online phase. On the other hand, the Shield could improve the consumers' satisfaction by improving the quality of the script continuously.

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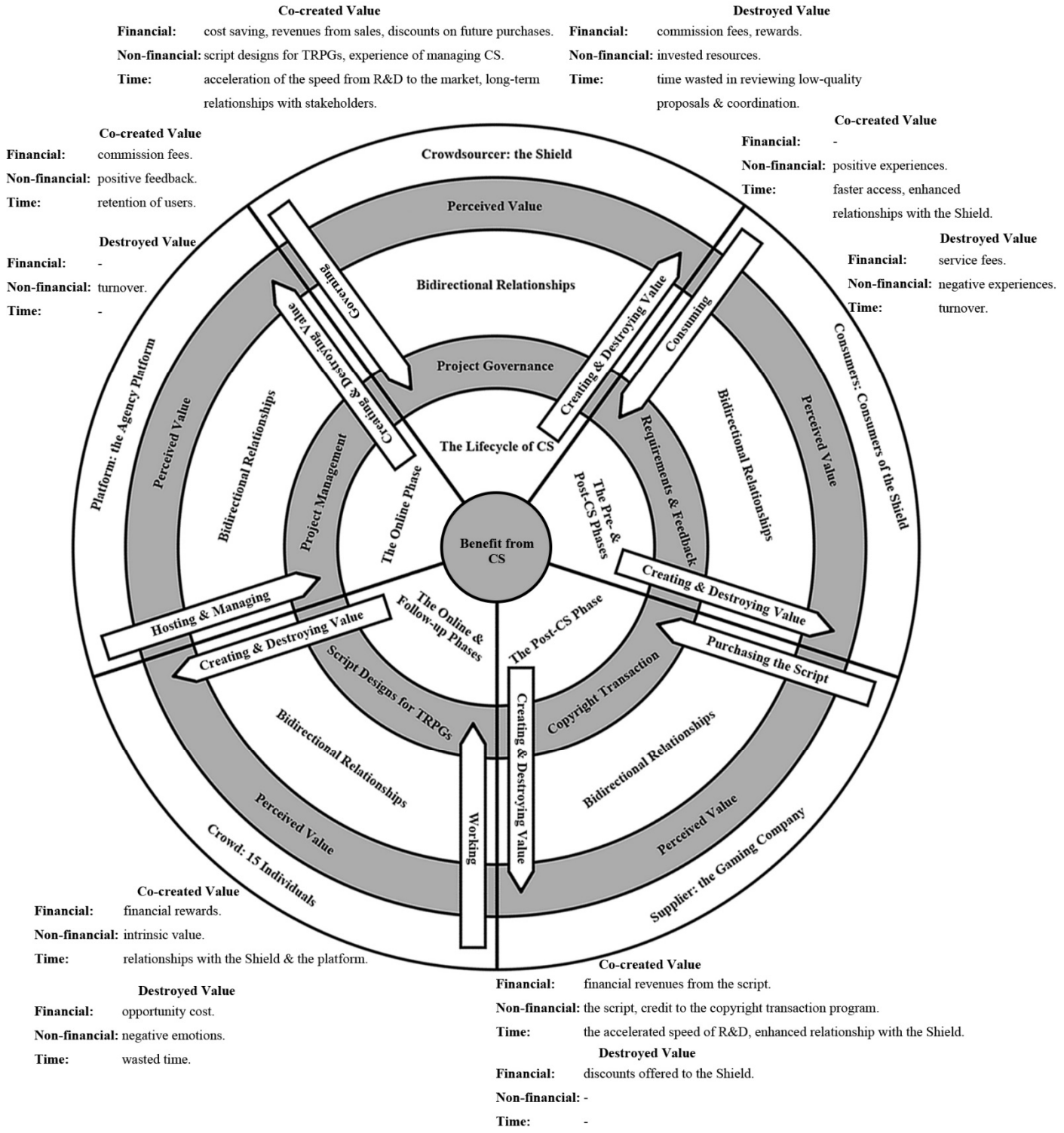

Figure 2. The analysis of the value co-creation in the crowdsourcing project initiated by the Shield.

7. Conclusions

Crowdsourcing has been an available option to supplement traditional ways of sourcing. While firms are increasingly leveraging crowdsourcing to co-create value with external stakeholders, assessing value co-creation in crowdsourcing is significant. In this study, we propose a framework for analyzing value co-creation in crowdsourcing by integrating the theories and frameworks in value co-creation and crowdsourcing. Results of the analysis generate a holistic view of the key stakeholders, joint purpose, value co-creation processes, bidirectional relationships of engagement, and perceived value, revealing

the business performance of the project and identifying the areas of improvement regarding business sustainability. This is a major theoretical contribution of this study. In addition, we empirically investigated a crowdsourcing project with the proposed framework, which enriched the contexts of value co-creation studies.

For practitioners, the proposed framework can be a useful tool for managing crowdsourcing projects. As illustrated in the case study, the analysis follows a process of identifying the key elements specified in the framework. Results of the analysis can provide abundant managerial implications, such as which stakeholders are dissatisfied, which processes generated the most value, and how stakeholders can be better compensated.

We anticipate two limitations of this study. First, while the framework prioritizes the perceived value of stakeholders, a crowd of unknown individuals increased the difficulties in collecting such data. This issue also happened to other stakeholders. We included all winners and other seven individuals in the crowd and supplemented with additional data sources (e.g., documentation and observations) for other stakeholders. However, this might negatively impact the comprehensiveness and accuracy of the analysis. Second, the framework does not include any metric for quantitative analysis. Hence, it can only be used for qualitative diagnoses. In future research, this framework can be extended by relating to the quantitative measurement of value. Moreover, the proposed framework can be applied to empirically investigate more types of crowdsourcing applications, which can contribute to both value co-creation and crowdsourcing studies.

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