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Value Co-Creation in Sports Live Streaming Platforms: A Microfoundations perspective

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Abstract

As a primarily synchronous social media form, social live streaming services (SLSSs) offer real-time interaction between streamers and viewers, and among viewers. Users' value co-creation has become increasingly crucial for platform businesses to increase their competitive advantage. However, the previous studies using the microfoundations approach have only confirmed the employees' efforts to adopt technology as a way to achieve the firms' goals. This study explores the microfoundations of external actors' (viewers and streamers) value co-creation on sports live streaming platforms (SLSPs). Taking China Sport as a case study, this paper conducted netnography research with observations made of four live-streamed matches on the final matchday of the International Table Tennis Federation (ITTF) World Tour Grand Final 2019. In total, 16,204 real-time messages and 5,540 gifting messages were reviewed. In-depth interviews were also conducted with five streamers and 15 viewers. As a result, a typology of viewers (managers, fans, and audiences) emerged, and five viewer-streamer-viewer value co-creation activities were revealed. Furthermore, the unique value-in-use among streamers and viewers in different activities was found. This study presents a model to show that the viewers' engagement and the value co-creation activities between viewers and streamers at a micro-level determines the value-in-use formation, which in turn, contributes to the competitive advantages for SLSPs at a macro level. This study contributes to the existing literature of engagement behaviour and value co-creation by empirically examining the role of external actors' engagement as the microfoundations of value co-creation in the context of new social technologies — SLSPs.

Keywords: service-dominant logic; microfoundations of value co-creation; sports live stream platforms; competitive advantages; sports viewing behaviour.

Managerial relevance statement

Several important managerial implications are indicated in this study. Firstly, the research findings can serve as guidance to streamers when they are communicating and interacting with different types of viewers, and help them realise their perceived value. SLSPs could adopt our findings to provide online tutorials to train streamers to improve their relationship marketing skills. Secondly, it is important that SLSPs firms understand that viewer-streamer-viewer value co-creation could be advanced by technologies provided by the platforms. Therefore, the platform businesses could develop interactive interfaces to support the interaction between streamers and viewers on SLSPs. AI algorithms can be adopted to identify the types of viewers and develop the automatic chatting functions to enhance the engagement between streamers and viewers. Moreover, similar to the E-sports platforms, 'Voice Chat' functionality could be developed by SLSPs to enable streamers to invite viewers to stream live together in one window. Thirdly, we argue that by applying the findings of the various customer-streamers value co-creation activities, the SLSPs should monitor and boost the performance of the viewer-streamer-viewer interactions to facilitate the building of competitive advantages.

1 **Introduction**

2 Web 2.0 applications, such as websites for social networking and microblogging, capitalise on
3 the ability and willingness of people to share information, ideas, messages, and other content
4 [1]. The Web 2.0 era not only provides users with more opportunities to communicate, but
5 also provides companies with the tools to interact effectively with customers and build
6 customer relationships that will enable marketers to understand the demand of customers [2].
7 Meanwhile, Industry 4.0 also drives digital solutions in an increasing number of branches of
8 the economy [3]. Customers use various digital products such as laptops, tablets, and
9 smartphones that allow them to access interesting contents [4].

10 In recent years, the full popularisation of smartphones, 5G, and Wi-Fi has led to a
11 surge in the number of social live streaming services (SLSSs) all over the world. From mobile
12 viewing to social viewing, and from mobile commerce to social commerce, it illustrates the
13 transitions happening because of SLSSs. An increasing number of people, no matter whether
14 they are celebrities or grassroots individuals, have begun to use live streams to share their
15 knowledge, showcase their talent, share their personal lives, and more. These streamers attract
16 viewers and make money by receiving virtual gifts from their viewers. The virtual gifts
17 received are transformed into cash, which contributes to the revenue shared by the streamers
18 and the platform [5]. Due to the outbreak of COVID-19, with sporting events being played in
19 empty stadiums and fans spending even more time online, the sports live streaming platform
20 (SLSPs) have taken centre stage in the broadcasting of sporting events, and provide a flow
21 experience, with active spectatorship, to sports fans [6]. On SLSPs, the streamers play an
22 important role of re-processing the sporting event contents by using their voices, appearances,
23 and framing skills [7]. Fans have the ability to choose their favourite streamer's room and
24 share their passion with the streamer and other viewers by sending real-time messages and
25 virtual gifts [8], [9]. In the traditional online community, such as brand community and social

1 media, firms can interact and communicate with their customer directly [10]. In contrast, the
2 SLSSs create a live platform where firms cannot carry out direct dialogue with viewers, but
3 provide a community for facilitating the communication between viewers and the streamers.

4 Value co-creation has become increasingly crucial for service providers that want to
5 increase their competitive advantage [11]. Although significant contributions, such as
6 information behaviour [8], [12], usage motivation [13], [14] , and the consistent watching
7 intentions on E-sports platforms [15], have been made to the SLSSs literature, there is a lack
8 of knowledge of how external users co-create value in response to organisational-level
9 competitive advantages. There are two important reasons for filling this gap in the research.
10 First, from good dominant logic (GDL) to service dominant logic (SDL), the “personalised
11 experiences of consumers” are becoming increasingly significant in value co-creation [16]. In
12 line with SDL, value is co-created by actors who interact with the service providers’ value
13 propositions. This value creation is always determined by the beneficiaries as there is no
14 value until the customer uses the offering (such as knowledge and performance) [16], [18].
15 Focusing on the individual level could clarify how value emerges under the influence of
16 individual resources integration. Second, the individual resources integration plays an
17 indispensable role in a company’s ability to achieve goals at the company level [19].
18 Therefore, understanding the engagement behaviour in the value creation process between
19 viewers and streamers is the antecedent of competitive advantages for SLSPs.

20 The microfoundation movement contributed to the understanding of “how individual-
21 level factors impact organizations, how the interaction of individuals leads to emergent,
22 collective and organization-level outcomes and performance, and how relations between
23 macro variables are mediated by micro actions and interactions” [11, p.4]. Studies have
24 highlighted the importance of the microfoundational perspective in the study of technology
25 transfer [20], value co-creation [21], servilisation [22], innovation [20], [23], [24],

1 sustainability [25], and so forth. These studies have explored the human-to-technology
2 interaction and the technology-enhanced human-to-human interaction [26]. Meanwhile,
3 existing research has also emphasised the internal individual efforts in responding to
4 organisational goals with or through the technologies. However, SLSPs are characterised by
5 streaming rooms and individual streamers who are not employees, but are users of SLSPs.
6 They share the profits of the platforms as working users who attract and interact with viewers
7 directly. Insight into how external actors impact the achievement of organisational goals is
8 lacking. Therefore, the purpose of this study is to advance our understanding of how
9 streamers and viewers integrate the resources from SLSPs to interact and co-create value, and
10 eventually drive the competitive advantages in SLSPs firms. The following research questions
11 underpin this study:

12 (1) What viewer types interact on SLSPs?

13 (2) How do the different types of viewers interact the streamers and other viewers
14 to co-create value?

15 These research questions respond to the calls for research that empirically explores the
16 engagement among streamers and viewers in an engagement platform from a microfoundation
17 perspective of value co-creation [26]. Since the nature of SLSSs is more interactive than that
18 of the traditional online community, it is important to explore the external actors' (streamers
19 and viewers) engagement behaviour and value co-creation. The findings of this paper extend
20 the scope of a microfoundational value co-creation process, and reveal three types of viewers
21 (managers, fans, and audiences) and five viewer-streamer-viewer value co-creation activities.
22 This study contributes to the existing literature of engagement behaviour and value co-
23 creation by empirically examining the role of external actors' engagement as the
24 microfoundations of value co-creation in the context of new social technologies — SLSPs.
25 This paper links external actors' value co-creation and firms' competitive advantages, and

1 argues that the engagement of viewers and streamers at the micro level could contribute to
2 macro-level outcomes in the form of competitive advantages for SLSPs.

3 The remaining sections will, firstly, review related literature and discuss the chosen
4 research method. It will then follow by the analysis and results. Finally, this paper will
5 present a conclusion and a discussion of the implications of this study alongside suggest
6 avenues for future research.

7 **Literature Review**

8 *Sports live streaming Platforms (SLSPs)*

9 The rapid growth of information-related technologies has had a huge impact on the business
10 process in the Web 2.0 era [27]. It is advised that a successful organisation needs to adopt
11 socio-technical approach [28], which is highlighting human attributes and relationships, and
12 technologies needed to transform inputs into outputs to engage with customers [29].
13 According to Kaplan and Haenlein [30], social media is “*A group of Internet-based*
14 *applications that build on the ideological and technological foundations of Web 2.0, and that*
15 *allow the creation and exchange of User Generated Content*”. As a primarily synchronous
16 social media form, SLSSs offer the opportunity for real-time interactions, which is different
17 from conventional social media such as Facebook and Twitter [30], [31]. In a live streaming
18 room, viewers engage with the functions of SLSSs to interact with the streamer and other
19 viewers.

20 The existing studies about SLSSs can be divided into s-commerce, topic-specific
21 SLSSs, and general SLSSs [6]. SLSPs are one of the topic-specific SLSSs that only focus on
22 providing sporting events and other sports-related content [61], [62]. Before delving into the
23 value co-creation between streamers and viewers on SLSPs, it is imperative to highlight the
24 features of SLSPs.

1 The first feature is copyright dependency. As opposed to general SLSSs and Esports,
2 where diverse streamer-generated videos of streamers' solo experiences are created as
3 streaming content, the SLSPs rely on the sports events copyrights [12], [32], [33]. The SLSPs
4 streamers cannot create streaming content but instead they re-process the provided sports
5 contents such as professional sporting and mega sporting events [32]. Not only is the SLSPs
6 streamer's voice heard, but their presence can become part of the content through the SLSPs
7 interface [6]. They can react to the viewers' comments and virtual gifts in real-time and
8 optimise the live streaming process in a timely way based on user feedback.

9 The second feature is the active spectatorship. Traditionally, viewers cannot
10 participate in the live broadcast when watching the TV live broadcasts, as they can only
11 passively accept the interpretation of the event by the anchor [34]. The SLSPs break this
12 limitation and offer the viewers an interactive experience. The spectatorship on SLSPs has
13 evolved into a social way in which viewers can enter the streamers' streaming rooms
14 selectively and choose based on their personal viewing needs. This is important when there
15 are multiple live broadcasts of an important match at the same time [34]. The SLSPs have
16 developed a series of hi-tech functions, such as the 360-degree view, virtual reality, and
17 multi-screen display. Not only can viewers watch the sports game through these technology-
18 based functions and listen to the streamers, but they can also interact with the streamers and
19 other viewers by sending real-time messages, gifts, and more.

20 The third feature is the streamer-hosted community. The emergence of streamers has
21 informed the change of the service ecosystem for value co-creation. Traditionally, on the
22 social media platforms or in online brand communities, the community is consumer-hosted
23 or company-hosted [35]. In these communities, the customers are attracted by the sporting
24 brand's content, and interact with each other by discussing brand-related topics [36].
25 Meanwhile, the brand can also interact with its followers by replies to Facebook

1 updates/Tweets [28]. Therefore, the B-C resource integration of value co-creation is available
2 in the social media context. However, in SLSPs, although the sporting event appeals to the
3 viewers and streamers coming to the SLSPs, it is the streamers who further attract viewers to
4 enter their different streaming rooms where they would have created a streamer-hosted social
5 group. Therefore, handling the engagement between streamers and viewers on SLSPs can
6 add new knowledge to the usage of the socio-technical approach in business process.

7 ***Engagement as the microfoundation of the Value Co-Creation Process***

8 The microfoundational approach is a way of thinking that is based on the connection between
9 the micro, meso and macro firm levels [3], and focuses on how “*individual-level factors*
10 *impact organizations, how the interaction of individuals leads to emergent, collective and*
11 *organization-level outcomes and performance, and how relations between macro variables*
12 *are mediated by micro actions and interactions*” [11, p.4]. The existing literature has adopted
13 the microfoundational approach to examine the influence of employees’ efforts to adopt
14 technologies on a firm’s innovation [20], [23], [24], sustainability [25], technology transfer
15 [20], servitisation [22], and so forth. For example, Scuotto et al., [23] highlight that the
16 microfoundations of individual internal digital capabilities, i.e., individual information skills,
17 communication skills, and software skills, contribute to SME growth and innovation. Apart
18 from examining the role of internal individuals’ efforts, previous studies have also identified
19 the ability of artificial intelligence (AI) to facilitate effective communication on social media
20 [27], and the external actors’ (suppliers and customers) value co-creation practice in
21 supporting platform development [21] and B-to-B value co-creation [11]. However, as a
22 platform, the strategic management of SLSPs should shift from improving internal resource
23 optimisation and external resource integration to facilitating interactions and value co-creation
24 between external actors [37]. Therefore, the study of the microfoundation of value co-creation

1 in SLSPs should be focused on the engagement behaviours between streamers and viewers
2 [26].

3 The SDL highlights that value is co-created through a process of service exchange and
4 recourse (skills and knowledge) integration activities among actors who contribute to each
5 other's benefit in a service system [18], [38]. The interactive consumer experiences co-created
6 with other actors can be interpreted as the act of "engaging" [39]. Storbacka et al. [26]
7 proposed a microfoundational view of value co-creation, and point out that effective co-
8 creation relies on a platform for actors (people, technologies, and other resources) to engage,
9 such as digital applications. Studies of SLSSs have explored the users' information
10 behaviours including broadcasting, watching, rewarding, and chatting (Scheibe et al., 2016).
11 Liu et al. [6] explained how real-time messages from viewers, which are displayed in a
12 separate window or animated over the stream screen, facilitate interaction with streamers and
13 other viewers. Lu et al. [12] highlighted the mixed function of paid virtual gifting, whereby a
14 viewer can purchase and send a gift to a streamer during the live stream.

15 In line with the SDL, value is co-created by actors integrate their own resources with
16 the service providers' value propositions and this is always determined by the beneficiaries as
17 there is no value until the customer uses the offering (such as knowledge and performance)
18 [16], [18]. The value outcome is the customer-perceived value that refers to the customer's
19 "feeling, thinking, wanting, sensing, imagining, and acting" [30, p.30]. Therefore, customers
20 acquire a unique perceived use value through enjoying usage [41], [42], which means that the
21 customers themselves decide the value of a value proposition based on the specificity of their
22 usage [17]. In the sport context, different spectators usually acquire a diverse range of values
23 when experiencing the same sporting event, since they each have their own specific interests,
24 e.g., experience the good atmosphere, team identification, and watching with family [43]. The
25 way that viewers engage in the real-time interactions with streamers and viewers may differ.

1 For instance, viewers can watch the players' performance and listen to the streamers'
2 commentary, send real-time messages and virtual gifts to cheer for the players or show their
3 admiration for the streamers, and discuss the event with streamers and other viewers [44].
4 These diverse engagement behaviours may drive different levels of perceived value among
5 streamers and the different viewers.

6 Therefore, this study concurs with the view that value-in-use is varied depending on
7 the viewer's specific interests when engaging in the different value creation activities [44].
8 We therefore explore the microfoundations of viewer-streamer-viewer value co-creation
9 activities and the co-created value in an SLSPs context.

10 *Value co-creation and Competitive Advantages*

11 The organisational resources and capabilities are perceived as indispensable role in improving
12 company competitive advantages and performance [45]. The resource-based view of strategic
13 management holds that firms can obtain a competitive advantage by controlling scarce and
14 valuable assets [46]. However, for the platforms business, which is under the service
15 dominant logic perspective (Vargo et al., 2008), the focus should shift from units sold to
16 exchanges of value between users on the platform. This is because the ultimate source of
17 competitive advantage for business platforms is decided by the number of interactions and the
18 value created among users [37]. The co-creation of value is a desirable goal for both
19 companies and consumers, and the value-in-use can help companies understand the needs and
20 preferences of consumers (Lusch and Vargo, 2006).

21 In addition, the profit model for the Chinese SLSSs industry is mainly divided into
22 three types: value-added services (virtual gifts), traffic monetization (advertising), and e-
23 commerce. Compared with the general SLSSs and game platforms, SLSPs mainly rely on
24 virtual gifts for revenue [6]. Therefore, promoting viewer engagement and continued usage
25 can create value for the SLSPs and improve their competitive advantages in the long term.

1 The existing literature has identified the positive role of SLSPs viewer value perception in
2 contributing to viewers' gifting behaviour, and viewer-viewer and viewer-streamer
3 interactions in influencing the viewers' continued intention to watch. Nevertheless, little
4 substantive research has provided a microfoundational understanding of the value co-creation
5 activities played by streamers and viewers in facilitating the value co-creation and improving
6 competitive advantages in SLSPs. This study aims to fill this gap in the literature by exploring
7 the engagement behaviour of different types of viewers and the value co-creation activities
8 they undertake with streamers. Such analysis can provide insights into value formation from
9 the perspectives of both streamers and viewers.

10 **Methods and Data Collection**

11 In order to gain a comprehensive insight into the phenomenon of the value co-creation
12 between streamers and viewers in SLSPs, this research uses interrogative and observational
13 methods, including the netnographic approach and in-depth interviews. In this study, one of
14 the top Chinese sports live streaming sites, China Sport (zhibo.tv), was selected as a case
15 study. Table tennis is seen as the Chinese national sport. It has the highest Peak Concurrent
16 Users (PCU) on China Sport. Therefore, the matches on the final match day (Dec 16, 2019,
17 12:40 to Dec 16, 2019, 20:40) of International Table Tennis Federation (ITTF) World Tour
18 Grand Final 2019 was selected for data collection.

19 In the first step, one of the popular streamers — Xiao Mage — was selected to record
20 the live streams on the final matchday. Xiao Mage joined in China Sport in 2016. He has the
21 most followers (316,000 followers) with the most stream views (7 million) out of all table
22 tennis streamers. The researcher was then provided with the live streaming data. The
23 researcher observed the value co-creation activities of both the streamer and the viewers,
24 including observing the streamer's verbal content and the viewers' real-time messages. The

1 researcher took reflective field notes in the process. The researchers were also provided with
2 the real-time messages and gifting data from this streamer's room by China Sport for this
3 study. In total, 16,204 real-time messages and 5,540 gifting data were collected.

4 Subsequently, semi-structured interviews were conducted with five streamers and 15
5 viewers who are all China Sport users. More specifically, we emailed the invitation letter to
6 these streamers who were selected based on two criteria: 1) have at least 100,000 followers
7 and 2) have streamed at least 10,000 hours. Moreover, we published advertisements for the
8 paid interviews on WeChat. There were 22 people interested in being interviewed. We then
9 selected the interviewees on two criteria: 1) Self-identifying as a table tennis fan for at least a
10 year; and 2) Using China Sport at least once a week. Two interview protocols were developed
11 based on identifying how viewers and streamers co-create value with one another. The
12 interviewer protocol for streamers comprised four parts: 1) streamers' roles in live streams; 2)
13 the ways streamers interact with viewers; 3) viewers' roles in live streams; and 4) what the
14 interactions with viewers mean to streamers. The interview protocol for viewers comprised
15 three parts: 1) What attributes of the streamer contribute to your watching experiences 2) The
16 way viewers engage with the streamer; and 3) What factor(s) do you value most when you
17 engage with streamer in the SLSPs? The questions originated from studies that examined
18 value co-creation in a sport context, and social media and live streaming studies [47], [48],
19 [49], [50]. As the initial questions were developed in English, it was necessary to translate
20 them from English to simplified Chinese to match the purpose of the study. These steps were
21 refined through three stages of translation [51]. Firstly, two bilingual individuals translated
22 the questionnaire into simplified Chinese. Secondly, another bilingual individual translated
23 the questionnaire back to English. Thirdly, in order to establish the clarity and accuracy of the
24 translated items, three Chinese-English students assessed the discrepancies between the
25 original protocols and the translated ones. The researchers interviewed each participant

1 independently online through WeChat video. The interview duration ranged from 45 to 65
2 minutes. All the interview scripts were digitally recorded and transcribed into a spreadsheet.

3 **Analysis and Findings**

4 In terms of data analysis, the widely applied computer-assisted software, NVivo 12, was
5 employed to code and categorise the qualitative data appropriately according to an iterative
6 process [52], [53]. Firstly, two independent coders, who are PhD students majoring in Sports
7 management, were invited to conduct coding process independently. Each of the independent
8 coders allocated data into different “Nodes”, which is the term employed by NVivo to
9 represent containers for different themes of information. Afterwards, in order to confirm the
10 themes, the researchers compared the results and decided the names of these themes by
11 consensus (see Table I).

12 Insert Table I about here.

13 ***The Three Types of Viewers***

14 Previous studies have developed a typology of sports fans according to fans identification and
15 participation in the event [54]. They have revealed that the social media attendees of a
16 sporting event have the lowest personal commitment to the team by compared to others such
17 as supporters and live fans who participating in the event on-site. Similarly, as evident from
18 the interviews with the viewers, the viewers’ identification with certain sports may not be
19 related to their engagement with the streamers. Therefore, it is assumed that the viewers who
20 come to the China Sport all have a certain level of sport identification and passion towards
21 table tennis. Their choice of streaming room and their behaviours differ due to their
22 identification with the streamers.

23 To represent viewers’ roles and behaviour, a simple matrix is built (see Fig. 1 below).
24 The ordinate axis is the variable “viewers identification with the streamer”, while the “level of

1 engagement in SLSPs” is reflected on the abscissa. The “viewer identification” is adapted
2 from the definition of fan identification in the studies on sport and social media [55]. In this
3 research, viewer identification is defined as “the personal commitment and emotional
4 involvement the viewers have with a streamer” and can vary in degree. Viewer participation
5 in the virtual community also varies. The results reveal that the viewers show different
6 engagement behaviours, including direct interaction (sending real-time messages, sending
7 virtual gifts, voting, and lucky drawing) and indirect forms of interaction (only watching and
8 listening) with streamers. It is worth noting that only the direct interactions co-create value,
9 hence, only these behaviours will be discussed in this research. As reported in Fig. 1, there are
10 three types of viewers, which are the room manager, fans, and the audience.

11 Insert Fig. 1 about here.

12 Regarding the way viewers interact with streamers and participate in the live stream
13 community when watching sports live streams, the *audiences* have a relatively low
14 identification with the streamers and enact fewer engagement activities. This group of
15 viewers’ motivations for being involved in SLSPs mainly involves appreciating unexpected
16 plays, exceptional skills, and various strategies [44]. Hence, they have little identification
17 with the streamers. Although they may send some real-time messages, the purpose of these
18 messages is to cheer players on with other viewers. Occasionally, they would engage with
19 streamers by typing ‘1’ or ‘2’ to vote for guessing which player would win. In addition,
20 acquiring knowledge and skills are other forms of motivation. However, as they have a
21 relatively low skill level and knowledge of table tennis, they are acquiring knowledge from
22 listening to the introductions of players’ information by the viewers, and by browsing the
23 real-time messages during the social chats, rather than asking questions themselves.

24 The *fans* represent the viewers who have a relatively high level of identification with
25 the streamers and who actively participate in the interactions. They are normally obsessed

1 with table tennis and perceive table tennis as an indispensable part of their lives. Therefore,
2 this segment of the viewers would like to interact with the streamers and other viewers who
3 can share their passion for the sport and players in the virtual communities. It was observed
4 that the *fans* participated in every activity in the live streaming room, including voting, social
5 chatting, and even asking and answering questions through sending real-time messages. In
6 order to have fun and interact with streamers, they are also willing to purchase and send
7 virtual gifts to keep the environment dynamic during the live streams.

8 *Room managers* are not just viewers but are also workers who are responsible for
9 overseeing the environment of the chat room for the streamers. They are selected from the
10 fans by streamers as they have a strong identification with the streamers. Room manager is
11 also a symbol of the viewer's status, which represents the streamer's trust in this particular
12 viewer. If a viewer becomes the room manager, the viewer's ID/Name is highlighted in the
13 open viewer chat and thus can more easily attract the attention of the streamer. The room
14 managers are knowledgeable in the table tennis domain. Therefore, their special engagement
15 activity is to answer the questions posed by different viewers when the streamer is focusing
16 on delivering the commentary. However, they must be very alert so as not to give biased
17 answers as this could cause dissatisfaction and even trigger verbal wars among other viewers.
18 Another room manager's key duty is to harmonise the language environment of the live
19 streaming room in order to ensure viewers have a good viewing experience. To achieve this,
20 room managers have the right to mute or even block anyone who misbehaves by maliciously
21 attacking streamers and players.

22 ***The perceived value of co-creation activities***

23  Insert Fig. 2 about here.

24 The main purpose of this study is to shed light on how viewers and streamers engage in value
25 co-creation by identifying the interactions among them (see Fig. 2). We found that the

1 streamer and viewers undertake a series of value co-creation activities, such as commentating
2 on matches, building friendship, addressing questions, re-processing content and maintaining
3 environment in the SLSPs community (see Table II below). These activities involve a two-
4 way interaction between streamers and viewers, and among viewers. Each of the parties in
5 this multi-layered interaction can acquire unique value-in-use during the value co-creation
6 activities based on the way how they interact with each other (see Table III below). Vocal
7 communication is the main interaction method for streamers, while the viewers can interact
8 by gifting, real-time messaging, and through other online social media tools.

9 Insert Table II about here.

10 Insert Table III about here.

11 *Commentating on Matches*

12 Just like the commentator in traditional sports broadcasts and TV, the important duty for the
13 streamer is to commentate on the match, which includes introducing the players, the sport's
14 history, and the process of the match. However, unlike traditional sports broadcasters and TV
15 commentators, where you normally have two commentators (the host and a professional
16 guest) working together to commentate on the match, on SLSPs there is only a single
17 streamer who interacts with the viewers in the live streaming room [56].The streamers place a
18 higher value on playing both the role of the host and the professional guest who contributes
19 rich information to the community. As one streamer interviewee stated:

20 I am also a national referee; I would sometimes introduce what is happened during the
21 match from a professional referee's perspective. For example, Zhou Yu incurred a
22 suspensions penalty because he teared off his rubbers during a match. Many viewers
23 argued that it was reasonable to tear off rubbers if the rubbers are broken. Then I made
24 explanations according to the ITTF regulations.

1 The expertise of streamers is one of the most important value propositions that
2 contribute to the viewer experience. A statement made by a streamer who was formerly coach
3 can exemplify this point. He stated that: “During the match, if I saw some useful techniques
4 or good habits that are suitable for the beginners or amateurs, I would introduce them to the
5 viewers.”

6 It is interesting that the SLSPs also give the viewers opportunities to commentate on
7 the match and express their own opinions in real-time. An example, posted by a viewer No.
8 3445626, commentated on one particular strategy as follows: “when Ma Long touches short,
9 Fan shouldn’t dig long but instead focus on controlling the ball and finding a way to attack.”
10 (No.3445626, 2019-12-15 21:03:05)

11 From the streamers’ perspective, a sense of mission and self-identification play a vital
12 role that enables them to engage in this value co-creation activity. In most cases, when
13 commentating on a game, the streamers’ self-identity can be realised when viewers approve
14 of the streamers’ opinions and professionalism and show their concerns for the streamers’
15 health via real-time messages. From the viewers’ point of view, they can acquire information
16 and knowledge from listening to the commentary of the streamers and by reading the
17 commentary of other viewers from the real-time messages. They also acquire a certain level
18 of self-identity from other viewers through sharing their own knowledge of table tennis.

19 *Building Friendship*

20 As a community of sports viewers, the SLSPs serve as a home where conversations about
21 sports matches, and players are carried out between family members — streamers and highly
22 engaged viewers. In this big family, the role of the streamers is to act as introducers who
23 bridge the gap between and connect viewers. In this regard, a streamer interviewee strongly
24 emphasises this important value co-creation activity:

1 During the match day, there are thousands of real-time messages on the screen. I would
2 use my cat-like eyes to pick up interesting and meaningful messages and then introduce
3 the message producers to other viewers. For instance, I often talk about the name and
4 opinions of “Xiao Malong” and, as time goes by, other viewers would get familiar with
5 him. When “Xiao Malong” enters the room again, I do not need to introduce him, as
6 some of the viewers would already know and say hi to him. Then other viewers would get
7 to know that Xiao Malong is a famous viewer in this live streaming room. I hope these
8 activities could make viewers feel that they are bonded together in this live streaming
9 family.

10 To illustrate this result of this value co-creation activity, one viewer interviewee stated
11 that:

12 Streamers give us the opportunity to make friends who have common interests but are
13 more knowledgeable than me [. . .]; I strongly feel that we are like a family, and I can
14 acquire knowledge from them. Both streamers and viewers acquire a strong sense of
15 community.

16 *Addressing Questions*

17 Compared with the monologue of sports commentators or the dialogue between sports
18 commentators in traditional sports event radio broadcasts and TV broadcasts, a more
19 interactive communication between streamers and viewers is made possible with the newly
20 introduced live streaming platforms. On SLSPs, the viewers can send real-time questions via
21 real-time messages instead of only listening to the streamers. The streamers would quickly
22 scan all the messages from various social media platforms and then address their questions
23 accordingly by simply talking in a live streaming room. All interviewed streamers stated that
24 they are responsible for reading the questions and comments, and then addressing them.
25 However, the streamers focus on following the pace of the match rather than answering all the
26 questions sent by the viewers. According to the streamers, it is important to find the right time
27 to answer questions since introducing the matches is the highest priority. This is described by
28 one of the streamers as follows:

1 I can only talk between the games or rounds. Therefore, during a certain amount of time,
2 I would first introduce the game, including what happened in the match. If I still have
3 time, I will then pick up some match-related questions to answer.

4 Similarly, another streamer emphasised the timing for answering questions according
5 to the types of questions and following the pace of the match:

6 If viewers are asking for information, such as the date for the next Chinese Open, which
7 is not relevant to the ongoing game, I will not answer it immediately but wait until I have
8 some time later. Most of the time, other viewers would help me to answer. If I saw a real-
9 time question that is highly relevant to the ongoing game, I will try to answer it as soon as
10 possible. For example, in the 2019 China Open, Fan Zhendong lost the first game to Ma
11 Long, and one viewer sent a real-time message to ask what the improvement of Fan
12 Zhendong is in the last two years. I normally would immediately conclude what the other
13 viewers' opinions are and then present mine.

14 In the former study of customer to customer value co-creation, Pongsakornrungsilp
15 and Schroeder [47] state that the viewers who ask questions are usually the beneficiaries as
16 they only benefit from interacting with others in the community. However, in this study, the
17 results reveal that the viewers are no longer only acting as beneficiaries. Instead, they are also
18 co-creating value for the streamers via the value co-creation activity of asking questions, as is
19 explained by one streamer:

20 Sometimes, if a viewer asks a question that I am not quite sure about, I will discuss it
21 with the community viewers to find a good answer. In this way, not only can I
22 accumulate knowledge and experience, but it also encourages me to consolidate my
23 professional knowledge in table tennis through different ways, such as reading relevant
24 articles and watching online courses presented by the national coaches.

25 As this quotation shows, the streamers strive for self-improvement, which is a value
26 that is co-created with the writers of the questions.

1 As mentioned above, answering questions is not always the priority of streamers on
2 SLSPs. Instead, the viewers also participate in this activity by sending real-time messages to
3 answer questions related to techniques, strategies, scores, players' conditions, styles, and so
4 forth. This is in line with the view that consumers would like to present themselves in the
5 online community to seek and develop influence and build an identity among the community
6 viewers [35]. In this way, these clusters of viewers not only provide knowledge to the
7 streamers and other viewers, but they can also be satisfied by gaining a sense of self-identity
8 through self-presentation.

9 *Re-processing Content*

10 In the traditional sports broadcast and TV media, the commentator would only officially
11 commentate on the sporting event while the reviewers listen to the commentators. However,
12 the virtual gifts and real-time message functions of SLSPs enable the streamers and viewers
13 to acquire entertaining viewing experiences.

14 According to the data from both the netnography and in-depth interviews, this study
15 finds that both streamers and viewers re-process and add value to the sporting event contents.
16 In SLSPs, the streamers' voice and presence can become a part of the content. They set a
17 unique live streaming style to exhibit humour, sing songs, cheer along with viewers, and offer
18 virtual gifts to create a unique viewing experience for viewers. One viewer's statement
19 reflects this value: "the streamer makes funny jokes and sets quizzes with us. I found these are
20 interesting."

21 Besides, during the live streaming process, the viewers purchase and send virtual gifts,
22 the actions of which are exhibited to all viewers of the stream and thus publicly show one's
23 appreciation in the stream and admiration for the streamer [12]. Meanwhile, this admiration
24 and appreciation could also be received by the streamers who can gain a sense of achievement
25 and self-identification. One viewer stated:

1 I send virtual gifts to attract the streamer’s attention. If he notices my gifts and responds
2 to me, I feel very excited. I think we are very close. I also feel giving gifts is very
3 dignified. Not only can the streamers notice me, but other reviewers would know I sent a
4 very expensive gift.

5 Gifting is a bidirectional exchange. Several streamer interviewees revealed that they
6 would also reward viewers by increasing their identity and interaction with them during the
7 stream. As noted by one streamer: “I usually set up quizzes, and the viewers have the
8 opportunity to receive gifts from me if they answer a question correctly.” Besides, as
9 observed in the netnography study, the streamers set up a quiz to let the viewers guess which
10 player will win the match by typing 1 or 2. The winner will be involved in a lottery draw to
11 win a table tennis bat with Liu Shiwen’s signature.

12 Moreover, the viewers can also re-process the sporting event content that provided by
13 the official signal by sending real-time messages. These messages can be animated on the
14 stream screen, which is called Danmu [57], offering an immersive experience to viewers [12].
15 Some respondents of fans firmly believe that watching sporting events on SLSSs is
16 entertaining. For example, one interviewee illustrates his perceived value of entertainment
17 when viewing the sporting events on SLSPs as follows:

18 The real-time messages fly across the screen. It makes me feel that myself and other
19 viewers are creating the content. There are others’ thoughts, jokes, and even quarrels
20 [...]. I like to watch the Danmu. Watching sporting events with strangers offers me a
21 special experience that is full of freedom and relaxation. This is different from watching
22 with friends and family.

23 *Maintaining Environment*

24 The live streaming room is the community for viewers to watch the match, cheer for the
25 players, and express their support together. In the meantime, some trolls and inappropriate
26 content could be streamed on the screen, which may cause a disorderly environment. This

1 would then result in a diminishment of the wellbeing of viewers who expect a focused
2 spectating environment [58]. In this regard, the streamer and room managers are responsible
3 for maintaining the environment of the live streaming room. The streamers have the right to
4 kick viewers out of the room and block viewers. However, it was observed that that some of
5 the streamers seem not to be really concerned about the environment, as one interviewee
6 explained:

7 I believe that the viewers in my room have self-discipline. During the match, although
8 some of the viewers would express different opinions or have opposite positions, they
9 would stop discussing or arguing if the match finished or changed. Moreover, one of the
10 characteristics of the social media is that viewers or fans can share their enthusiasm with
11 others and express their affiliation to players. I can't stop them. However, the official
12 platform regulators often block the inappropriate content.

13 Nevertheless, the room managers actively supervise the language environment of the
14 live streaming room in order to build a clean and pure viewing atmosphere. According to the
15 interviewed room manager, they understand that a majority of the viewers expect to enjoy
16 watching the game, rather than being affected by the trolling content. To achieve this purpose,
17 the room managers would block someone who misbehaves, where misbehaviour may include
18 maliciously attacking or cursing streamers and players, for example. Meanwhile, this action is
19 supported by most of the viewers. The following sample posts demonstrate how the viewers
20 seek a healthy watching environment: (1) "Streamer, can you please kick 'Tian Tang Niao'
21 out of the streaming room? (No. '7869782', 2019-12-15 21:06:27)"; (2) "Can we support both
22 players? Don't abuse. (No. '10685944', 2019-12-15 21:09:06)" These messages reflect that
23 the viewers have the right to express their support for players in the community to satisfy
24 their need for fan identification. This also illustrates that some of the 'blocking' and 'kicking
25 out' actions could prevent serious misbehaviour, like trolling, to provide a healthy viewing
26 environment.

1 **Conclusion and discussion**

2 In the Web 2.0 era, SLSPs are used as an effective tool for sports viewers to watch sports
3 events and interact with streamers and other viewers. From the perspective of SLSPs firms,
4 the effective interaction among viewers and streamers is considered to be an important
5 enabler of users' value co-creation, and also contributes to a firm's competitive advantage
6 (see Fig. 3 below).

7 Please insert Fig. 3 around here.

8 As per the SDL perspective, this research examined the microfoundations of viewer-
9 streamer-viewer value co-creation on SLSPs. First, this study reviewed the literature and
10 identified the theoretical relationship between users' engagement (micro level), users' value
11 co-creation (micro-macro level), and firms' competitive advantages (macro level). Second,
12 based on the theoretical foundation, this study used China Sport for netnographic research and
13 invited five streamers and 15 viewers, from the platform, for semi-structured interviews.
14 Using NVivo 12 for data analysis, this study has revealed three types of viewers: audience,
15 fans, and managers. In addition, five value co-creation activities and six value-in-use have
16 emerged from the analysis. The results of the value-in-use analysis support the notion that
17 viewers' perceived value-in-use is determined by their individual identification with streamers
18 and their level of engagement on SLSPs.

19 Previous studies have emphasised actor engagement effects but give only limited
20 theoretical guidance on how external actors can jointly contribute to the platform's
21 competitive advantages[26], [21]. In line with the service dominant logic perspective, this
22 study contributes to the existing literature of engagement behaviour and value co-creation by
23 empirically illustrating that the technology-enhanced interaction between viewers and
24 streamers at the micro level could contribute to macro-level outcomes in the form of
25 competitive advantages for SLSPs.

1 *Theoretical implications*

2 This study makes three contributions to the existing literature on engagement behaviour and
3 value co-creation. First, despite the increasing attention targeted at exploring users' value
4 perceptions and engagement behaviours, no studies have been conducted linking external
5 actors' value co-creation and firms' competitive advantages in the context of SLSPs. Our
6 research tries to fill this gap and responds the call for an empirical exploration of the role of
7 actor engagement as the microfoundation of value co-creation on SLSPs [26].

8 Second, as a newly emerged type of synchronous social media platform, SLSPs not
9 only allow viewers watch the sports game and listen to the streamers through technology-
10 based functions, but also enable viewers to interact with the streamers and other viewers.
11 Such interactions may take place in the form of sending real-time messages, gifts, and more.
12 Building on the features of SLSPs where streamers and viewers interact with each other in a
13 streamer-hosted community, another novel aspect of this study resides in its demonstration of
14 technology-enhanced human-to-human interaction. This study reveals how viewers and
15 streamers engage with the hi-tech functions and interface of SLSPs to interact with each other
16 and co-create value.

17 Third, this study developed and proposed a simple matrix of viewers' typologies
18 according to their identification with the streamers and engagement behaviours when
19 watching the sporting event live streams on SLSPs. This typology reflects the viewers' groups
20 (audience, fans, and managers) who potentially co-create value with streamers in SLSPs. It
21 helps demonstrate that the way in which viewers engage in real-time interactions with
22 streamers and viewers is different. It is also the antecedent of the viewer-streamer-viewer
23 value co-creation activities in the context of SLSPs. The results of this study have revealed
24 five microfoundational value co-creation activities, which are: (1) commentating on matches,
25 (2) building friendships, (3) addressing questions, (4) re-processing content, and (5)

1 maintaining the environment. The findings of this study have also stretched the knowledge of
2 value-in-use by showing how different types of viewers interact with the streamers and other
3 viewers. A range of distinct values has then been determined based on the viewers' specific
4 interest in participation. Meanwhile, viewers also contribute their value propositions to co-
5 create value for the streamers. In this regard, during the value co-creation activities, both
6 streamers and viewers can acquire their perceived value and create a better viewing
7 environment and experience. Therefore, the co-created value not only leads to producing a
8 stronger attachment between streamers and viewers, and among viewers, but may also
9 facilitate their continued usage of SLSPs, thus benefiting the platforms. The engagement of
10 viewers and streamers at the micro level could contribute to macro-level outcomes in the form
11 of competitive advantages for SLSPs [26].

12 *Practical implications*

13 Several important managerial implications are indicated in this study. Firstly, the research
14 findings can serve as guidance to the streamers when communicating and interacting with
15 different types of viewers and realise their perceived value. SLSPs could adopt our findings to
16 provide online tutorials to train streamers to improve their relationship marketing skills.

17 Secondly, it is important that SLSPs firms understand that viewer-streamer-viewer
18 value co-creation could be advanced by technologies provided by the platforms. Once viewers
19 and streamers have benefited from the value co-creation activities, their continued usage and
20 referrals to new users can in turn be beneficial for the platform in the long term. Therefore,
21 the platform businesses could develop interactive interface and other technologies to support
22 the interaction between streamers and viewers on SLSPs. SLSPs may also adopt AI algorithms
23 to justify the types of viewers and develop an automatic chatting function to enhance the emotional
24 engagement between streamers and viewers. Moreover, similar to E-sports platforms, 'Voice

1 Chat' functionality could be developed by SLSPs to enable streamers to invite viewers to
2 broadcast live together in one window.

3 Thirdly, we argue that by applying the findings of the various customer-streamers
4 value co-creation activities, the SLSPs could monitor and boost the performance of the
5 viewer-streamer-viewer interactions to facilitate the building of competitive advantages.

6 **Limitations and Future Research**

7 There are several avenues for future research endeavours. Firstly, this study is an important
8 pre-condition for inspecting the antecedents and consequences of value co-creation activities
9 between streamers and viewers. For instance, by using quantitative analysis, it would be
10 interesting to explore how different value co-creation activities are related to the three types
11 of viewers' perceived values. Second, this study only focused on triadic value co-creation
12 between streamers and viewers, and among viewers. It may be possible for future studies to
13 look at the broader level of relationship and even consider the whole value networks of SLSPs
14 ecosystems. Third, we must admit that the case study of live streaming technologies in the
15 current study is still based on the Web 2.0 framework. China Sports has not been yet fully
16 developed as a digitalised sports products in the Industry 4.0 era. For example, the Internet of
17 Things (IoT), cloud computing and analytics, and AI and machine learning are still lacking
18 throughout its operations. However, this research can motivate scholars to conduct further
19 research about technology-enhanced human-to-human interactions (especially among external
20 actors) based on the Web 2.0 and Society 4.0. Therefore, future studies should focus on what
21 the digital technologies for facilitating the external actors' engagement at SLSSs are.
22 Meanwhile, by considering the coming of society 5.0 [59][60], scholars may try to offer a
23 better understanding of how AI technologies might empower external actors' engagement and
24 contribute to firms' competitive advantages by using a microfoundational approach.

25

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19

1 Table I
 2 Coding results of the NVivo analysis.

Representative data	Coder 1	Coder 2	Final
“when Ma Long touches short, Fan shouldn’t dig long focus on controlling the ball and finding a way to attack.”	Commentating on matches.	Commentating on matches.	Commentating on matches.
“During the match day, there are thousands of real-time messages on the screen. I would use my cat-like eyes to pick up interesting and meaningful messages and then introduce the message producers to other viewers.”	Establishing community	Bonding friends	Building friendship
“Sometimes, if a viewer asks a question which I am not quite sure about the answer, I will discuss with the community viewers to find a good answer.”	Asking and answering questions	Addressing questions	Addressing questions
“The streamer makes funny jokes and sets quizzes with us. I found these are interesting.”	Re-processing contents	Amusing contents	Re-processing contents
“I am the manager of the live streaming room; I never take the initiative to make trouble. I should help the streamer to maintain the room environment.”	Maintaining the environment	Maintaining the environment	Maintaining the environment

3

4 Table II
 5 Descriptions of the value co-creation activities.

Activities	Descriptions
Commentating on matches	• Streamers and viewers commentate on the sporting events when watching the live streams.
Building friendship	• Streamers act as introducers who connect viewers and build a streamer-hosted community.
Addressing questions	• Streamers and viewers ask and answer questions
Re-processing content	• Streamers and viewers re-process the sports events content through their own resources.
Maintaining the environment	• Streamers and managers in charge of maintaining the environment of the live streaming room.

6

Table III
Viewer-streamer-viewer value co-creation activities.

Activities	Streamers	Audiences	Fans	Managers
Commentating on matches	<p>Description: Playing both the roles of the host who controls the attention of the viewers and the professional guest who contributes rich information and knowledge (i.e., techniques and referee knowledge) to the community.</p> <p>Perceived value: Sense of mission; Self-identity</p>	<p>Description: Focusing more on watching rather than commentating on matches.</p> <p>Perceived value: Knowledge acquisition</p>	<p>Description: Commentating on the sporting events by sending real-time messages to express their own knowledge of table tennis and improve the streamers' level of expertise to some extent.</p> <p>Perceived value: Self-identity; Knowledge acquisition</p>	<p>Description: Commentating on the sporting events by sending real-time messages to express their own knowledge of table tennis and supporting streamers' viewpoints.</p> <p>Perceived value: Self-identity; Knowledge acquisition; Social interactions</p>
Building friendship	<p>Description: Picking up good and meaningful messages; Introducing message senders to the other viewers; Enabling the other viewers to get familiar with the message senders.</p> <p>Perceived value: Sense of mission and a sense of community.</p>	<p>Description: Listening to streamers' introductions and reading the real-time messages sent by other viewers.</p> <p>Perceived value: Sense of community; Knowledge acquisition</p>	<p>Description: Listening to streamers' introductions and reading the real-time messages sent by other viewers.</p> <p>Perceived value: Sense of community; Knowledge acquisition</p>	<p>Description: Listening to streamers' introductions and reading the real-time messages sent by other viewers.</p> <p>Perceived value: Sense of community; Knowledge acquisition</p>
Addressing questions	<p>Description: Reading the question messages and responding while still following the pace of the match; Discussing with the community viewers to find answers for questions they do not know.</p> <p>Perceived value: Self-identity; Self-improvement</p>	<p>Description: Rarely sending real-time messages in the live streaming room.</p> <p>Listening to streamers answering the other viewers' questions</p> <p>Perceived value: Knowledge acquisition.</p>	<p>Description: Sending real-time messages in the live streaming room as well as privately messaging streamers on other social media platforms such as WeChat and Weibo.</p> <p>Perceived value: Knowledge acquisition; Self-identity</p>	<p>Description: Rarely asking questions but often sending real-time messages to share the responsibility of streamers for answering questions related to techniques, strategies, scores, players' conditions, styles, and so forth.</p> <p>Perceived value: Self-identity; Sense of mission</p>

Re-processing content	<p>Description: Sets a unique live streaming style to add value to the sporting event's content, such as through humour, singing songs, setting quizzes, and cheering along with viewers; Rewarding viewers by sending virtual gifts and physical equipment.</p> <p>Perceived value: Sense of achievement. Self-identification.</p>	<p>Description: Reading real-time messages sent by other viewers and listening to the streamers.</p> <p>Perceived value: Enjoyment</p>	<p>Description: Purchasing and sending virtual gifts and real-time messages to show their appreciation and admiration and contributing to the overall atmosphere.</p> <p>Perceived value: Enjoyment; social interactions; Sense of achievement</p>	<p>Description: Highly active in purchasing and sending virtual gifts and real-time messages to show their appreciation and admiration for the streamer and contributing to the overall atmosphere.</p> <p>Perceived value: Enjoyment; Social interactions</p>
Maintaining the environment	<p>Description: Reserving the right to kick viewers out of rooms and block viewers. Ignoring the misbehaviours and perceiving them as a way in which viewers share their enthusiasm and express their affiliations to players.</p> <p>Perceived value: Sense of mission</p>	<p>Description: N/A</p> <p>Perceived value: N/A</p>	<p>Description: N/A</p> <p>Perceived value: N/A</p>	<p>Description: Actively supervising the language environment of the live streaming room through blocking someone who misbehaves, such as by maliciously attacking or cursing streamers and players.</p> <p>Perceived value: Sense of mission</p>

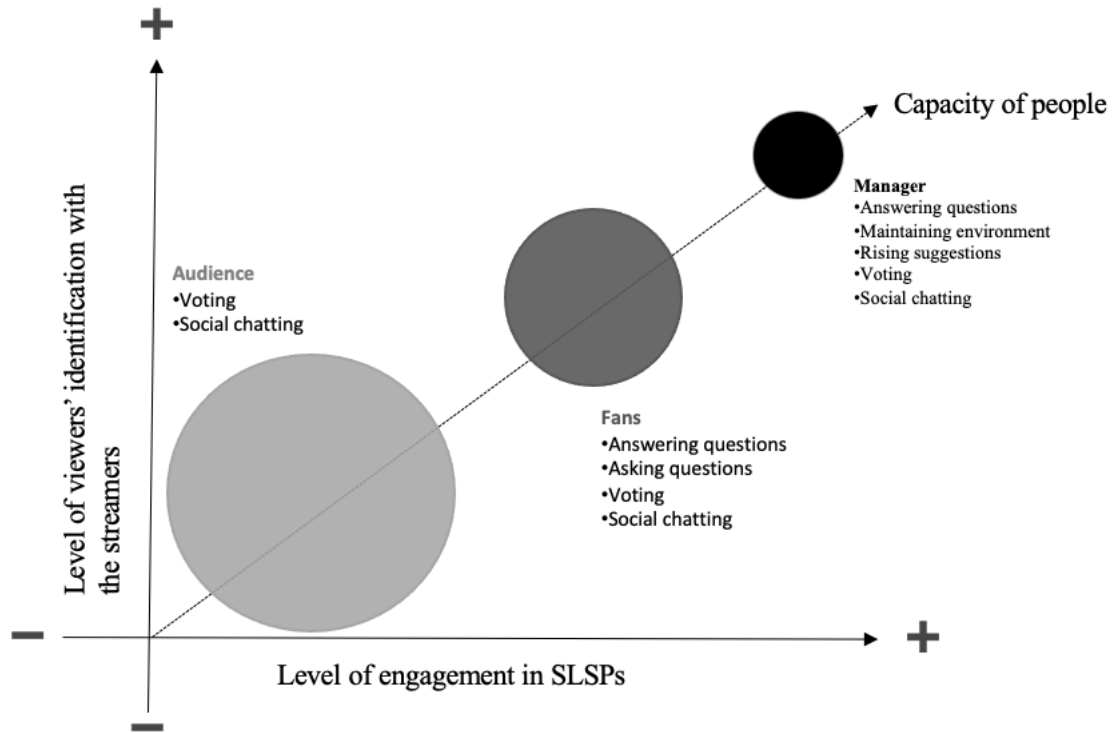


Fig. 1. The types SLSPs viewers.

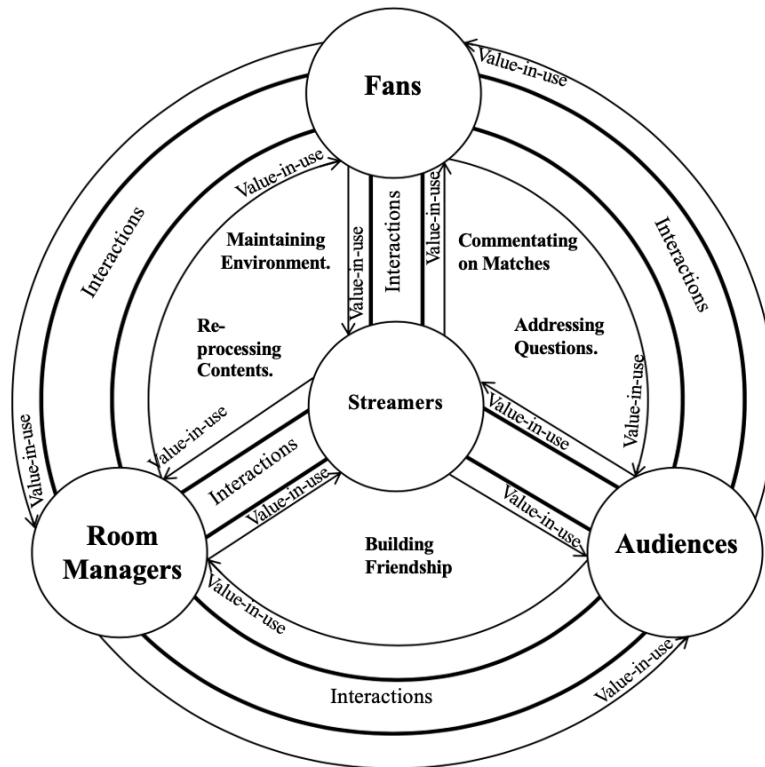


Fig. 2. The value co-creation wheel of SLSPs.

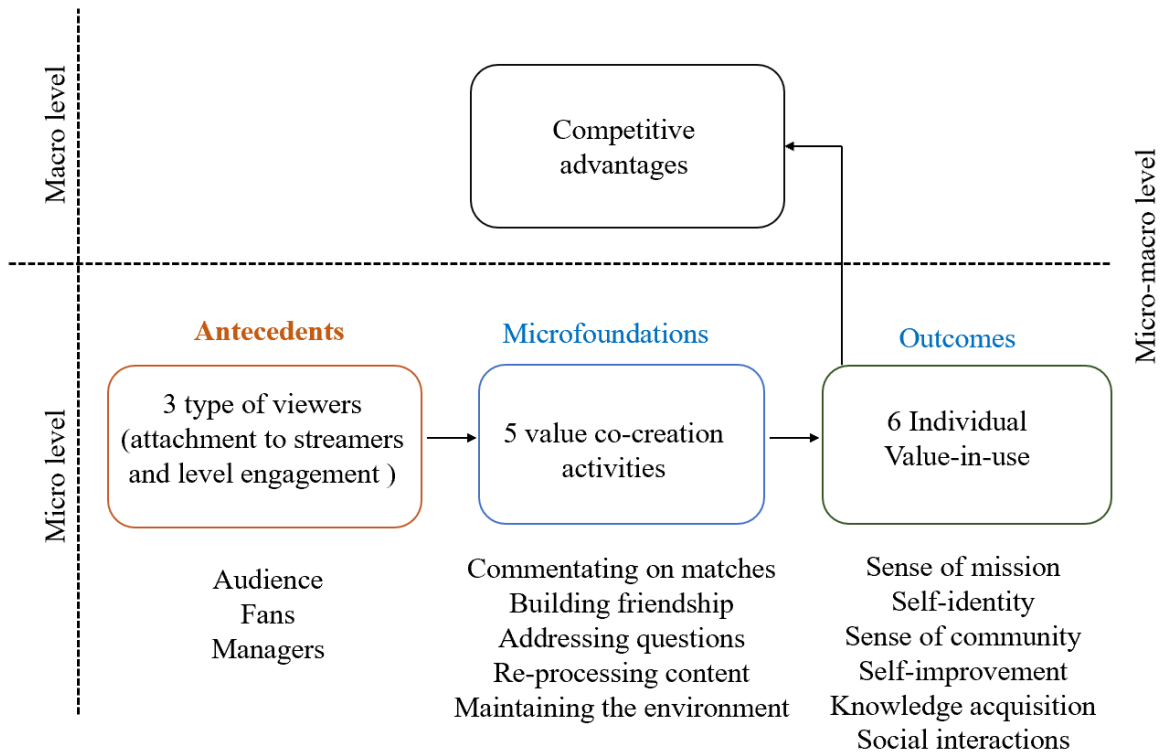


Fig. 3. The structure model of the microfoundational value co-creation in SLSPs.