EMPIRICAL ARTICLE

Current and future influences of COVID-19 on the knowledge management function of conventions and exhibitions

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Abstract

This study presents a new perspective on conventions and exhibitions (termed "C&E") as places of knowledge exchange and conversion in which participants acquire, create, and disseminate tacit and explicit knowledge. C&E is defined as a temporary cluster promoting tacit knowledge exchange, which cannot be conveyed without meeting in person. However, C&E has been forced to convert to online/virtual events owing to the COVID-19 pandemic and is now changing to a hybrid mode of on-site and virtual events. This phenomenon is expected to continue post-pandemic, as long as socialization for tacit knowing is still the primary concern for people attending events.

Keywords Conventions and exhibitions · COVID-19 · Meeting technology · Tacit knowledge · Temporary cluster

1 Introduction

In a knowledge-based economy, knowledge is considered a key source of competitive advantage, and the success of businesses and organizations depends on its effective management (Davenport and Prusak 1998; Nonaka and Takeuchi 1995). This includes knowledge acquisition, creation, storage, transfer, and application (Jasimuddin 2012). By managing knowledge well, companies and organizations can rapidly and continuously improve their products and services to keep pace with fast-changing markets (Maskell et al. 2006). In particular, knowledge acquisition is an important first step in creating competitive advantages.

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In this context, conventions and exhibitions (termed "C&E") provide participants with valuable venues for knowledge acquisition. Participants, as knowledge providers (KPs) and knowledge seekers (KSs), identify new technologies, market trends, and new products and services by attending C&E. In addition, face-to-face (F2F) interactions in C&E provide opportunities to exchange knowledge intensively (Bathelt and Schuldt 2010) and to expand social connections and networks (Sarmento et al. 2015). C&E provides an environment for knowledge sharing through learning programs, including workshops, forums, seminars, and clinics. These demonstrate the role of C&E as a knowledge acquisition and dissemination venue (Jung 2020b; Rinallo and Golfetto 2011; Maskell et al. 2004).

However, since 2020, this traditional form of C&E has changed owing to the COVID-19 pandemic. Amid global travel restrictions (Skare and Soriano 2021; UNWTO 2020), social distancing protocols, and prohibitions on mass gatherings (Khoa et al. 2021; Yang et al. 2021; Bae and Chang 2020), most events, such as meetings, conferences, conventions, and exhibitions, have been postponed or canceled (Prentice et al. 2021; Zwanka and Buff 2021; UIA 2020a, b). This unexpected situation has forced C&E organizers to find alternative ways to hold events through online or virtual platforms. They are enabled by meeting technologies such as Zoom, Webex, Microsoft Teams, and YouTube, to name only a few, the use of which has become widespread rapidly owing to the COVID-19 pandemic (Reinach 2021; Nadler 2020). However, not long after the pandemic outbreak, organizers began launching a hybrid event that combines online and on-site interactions.

Behind online/virtual and hybrid C&E, there is a new and wide introduction of meeting technology. C&E participants have the opportunity to communicate without meeting F2F over the Internet. For example, video conferences, SNS promotions, and virtual exhibition systems not only provide convenience for C&E participation, but also allow easy information exchange over long distances (Bathelt and Turi 2011).

The recognition of C&E as a venue for knowledge acquisition, creation, and dissemination raises three interesting questions. First, is it necessary to participate in remote C&E in the digital age when information is smoothly transmitted online? Even before the COVID-19 pandemic, in the 21st-century, the number and size of traditional forms of C&E had increased (UFI 2020; UIA 2020a, b). There has been no sign of a decline in the size or frequency of C&E. This proves that there are still important forms of knowledge that cannot be communicated or interacted with online or digitally (McDermott 1999). In this regard, there is a unique form of knowledge that can be gained only by physically attending C&E. In knowledge theory, this is known as "tacit knowledge." Polanyi (1966) first emphasized the importance of this type of knowledge, which cannot be completely expressed or codified.

Second, will online/virtual C&E replace traditional C&E or ultimately expand existing industries? The answer depends on how well the meeting technology facilitates the exchange of knowledge. It is effective in exchanging tangible or explicit knowledge owing to its characteristics. For example, scalability beyond the limits of time and space, storability to record data or information, ease of access, and cost-effectiveness are new values that would never be experienced at traditional C&E (PCMA 2021; Bathelt and Turi 2011; Munter 1998). However online/virtual C&E is

fundamentally limited in exchanging intangible or tacit knowledge. For various reasons, people cannot be deeply engaged in tacit knowledge sharing because intangible or tacit knowledge would not be available without meeting in person (Sarmento et al. 2015; Panahi et al. 2013).

Third, how extensively has the COVID-19 pandemic transformed the way people exchange knowledge at events? After the outbreak of the pandemic, most events were stopped or converted to online/virtual mode. As the pandemic progressed, traditional forms of C&E began resuming on a limited scale. However, one remarkable change was that events had begun evolving into "hybrid" C&E, which features at least one group of in-person or F2F attendees connecting virtually with other event attendees (Hameed et al. 2021; PCMA 2021). Hybrid C&E combines the benefits of live and virtual interaction with on-site and online attendees (Meetingsnet 2021; Fryatt et al. 2012).

To investigate these questions in detail, we suggest a knowledge view of C&E and compare it with existing views on why C&E exists. Many studies show that people participate in C&E for direct or indirect "sales" purposes. They participate in events to sell or buy products and services (Rittichainuwat and Mair 2012), promote new products/services (Mitchell et al. 2016; Jung and Choi 2008; Blythe 1999), know about customer demand (Gebarowski and Wiazerwicz 2014), enhance their corporate image (Mitchell et al. 2016), or establish relationships with customers for sales motives (Gebarowski and Wiazerwicz 2014; Jung and Choi 2008; Hansen 1996; Sharland and Balogh 1996). People attend events also to obtain better information, insight, and knowledge about market trends. In this regard, exhibitions become venues for acquiring and sharing information and knowledge (Rinallo and Golfetto 2011). Attendees at exhibitions want to learn new skills, knowledge, or technology through seminars or workshops and build relationships (Blythe 2002; Tanner et al. 2001; Munuera and Ruiz 1999; Morrow 1997; Rosson and Seringhaus 1995). For example, trade shows provide an excellent environment for exchanging information and knowledge, building networks, and assessing market trends (Maskell et al. 2006; Smith et al. 2003; Shipley et al. 1993).

Even though the existing literature discusses the role of knowledge acquisition and sharing in C&E, it has treated knowledge (and its creation and exchange) as one element, not as the key driver in explaining C&E. In other words, the traditional views have paid little attention to the role of knowledge in C&E. There has been little, if any, discussion on the role of tacit knowledge in explaining C&E function, that is, what is C&E for? In this study, we attempt to present an alternative view that regards C&E as a knowledge venue in which participants create, interact, and disseminate two types of knowledge, namely, tacit and explicit knowledge(see Table 1). In particular, the tacit knowledge or tacitness of knowledge is highly emphasized as the primary reason for people's participation in on-site events. By attending events in person, people desire to obtain tacit or intangible knowledge that is not transferable online and obtained only from F2F interactions. Based on the knowledge view of C&E, we also apply Nonaka's socialization, externalization, combination, and internalization (SECI) framework (Nonaka 1994) to explain C&E as knowledge venues or clusters. This application may illustrate many interesting cases of knowledge creation, expansion, and conversion in C&E contexts. These results provide

Table 1 Two types of knowledge

Tacit knowledge (subjective)	Explicit knowledge (objective)
Knowledge of experience (body)	Knowledge of rationality (mind)
Simultaneous knowledge (here and now)	Sequential knowledge (there and then)
Analog knowledge (practice)	Digital knowledge (theory)

Source The knowledge-creating company (Nonaka and Takeuchi 1995, p.61)

valuable implications for how C&E organizers need to shape actual C&E to fit into specific targets of knowledge exchange.

We also aim to identify how the COVID-19 pandemic has influenced C&E events worldwide. Most traditional meetings were canceled or postponed, following the trend of the so-called "untact," which minimizes or prevents contact among people (Bae and Chang 2020; Lee and Lee 2020). Only 4,242 international meetings were held in 2020 (UIA 2020a, b). This crisis has forced a change in the ecosystem—online meeting technology has been actively introduced into C&E. Even before the pandemic, online/virtual platforms served as assistants to traditional C&E. Now, online/virtual platforms have come to the fore, and C&E organizers have no choice but to opt for online/virtual events. However, online/virtual C&E cannot fulfill the role of a knowledge platform (Falconer 2006; McDermott 1999). This is because the sharing of tacit knowledge online is not as smooth as it is on-site (Johanessen et al. 2001). For this reason, C&E organizers are trying to host hybrid events that combine online/virtual and on-site events.

Based on our knowledge view, we aim to determine whether and the extent to which meeting technologies are effective in sharing explicit and tacit knowledge respectively in the C&E context. These technologies are effective in exchanging tangible or explicit knowledge owing to their characteristics but are fundamentally limited in exchanging intangible or tacit knowledge. Considering this knowledge characteristic of online conference technology, we can infer how this technology will broaden or expand the C&E market with new and advanced features of the technology.

The rest of this paper is structured as follows. The reason for participation in C&E is explained through a literature review in the following section. We compare the perspectives of previous research and knowledge-view research and highlight the difference between the two views. Then, we review knowledge theory in Sect. 3 to examine the role and function of knowledge in explaining C&E from the perspective of tacit knowledge. Then, in Sect. 4, we discuss the impact of the COVID-19 pandemic and the new meeting technology on C&E. In conclusion, we predict how C&E will evolve in their fundamental role as a knowledge platform in Sect. 5.

2 The reasons for participation in C&E

People attend C&E for various purpose. Many studies have discussed why people participate in C&E. Existing views on why people participate in C&E are mainly focused on sales purpose: a direct sales purpose, and an indirect sales purpose (see the leftmost column at Table 2). For the former, people participate in events to trade products and services (Rittichainuwat and Mair 2012), to promote new products and services, and to know about customer demands. Public shows are examples oriented directly to selling and buying products or services. Exhibitors enhance their corporate image and establish relationships with customers for sales motives (Gebarowski and Wiazerwicz 2014; Jung and Choi 2008; Hansen 1996; Sharland and Balogh 1996). For the latter, however, people attend events to obtain better information and insight into market trends. In this regard, exhibitions often become venues for acquiring and sharing information and knowledge (Rinallo and Golfetto 2011). Attendees of exhibitions also want to learn new skills or information through seminars or workshops, and to build relationships (Blythe 2002; Tanner et al. 2001; Munuera and Ruiz 1999; Morrow 1997; Rosson and Seringhaus 1995). For example, trade shows provide an excellent environment for information and knowledge exchange, building networks, and assessing market trends (Maskell et al. 2006; Smith et al. 2003; Shipley et al. 1993). The Center for Exhibition Industry Research (CEIR 1992) shows that 80% of attendees participate in exhibitions to "discuss problems or ideas" with professionals in profession or industry. The CEIR (1992) also indicates that 76% of all exhibition visitors arrive with a "pre-planned agenda to obtain intended knowledge."

We suggest and present a knowledge view as a comparison with the existing view. In particular, we pay more attention to tacit knowledge than explicit knowledge. We illustrate that all purposes of C&E in the traditional view can be explained as explicit or tacit from the knowledge view (see the rightmost column at Table 2). In C&E, explicit knowledge is objective and easily digitalized. Tacit knowledge is not easily transferable, because it is context specific (Malmberg and Maskell 1997). To share tacit knowledge in C&E, people must have the so-called socialization process (Nonaka and Takeuchi 1995). They must essentially have F2F interaction, emotional intervention, or immersion to convey "knowledge of experience" that is created "here and now" in a specific, practical context that cannot be taught by books, manuals, or online (Nonaka et al. 2000; Nonaka and Takeuchi 1995, p. 61). Mitchell et al. (2016) suggest the importance of socialization, which represents all values of C&E, such as building relationships and networking.

3 C&E as a knowledge platform

As knowledge becomes the main source of wealth, knowledge management is recognized as the core way to achieve organizational performance and sustainable competitive advantage (Drucker 1999; Davenport and Prusak 1998; Nonaka and Takeuchi 1995; Romer 1986). The need and demand for C&E that enables the flow

Table 2 Reasons for participating in C&E: traditional vs. knowledge views

Traditional view		①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	Knowledge view
Direct sales purpose	Selling or buying			O			O				O			O	O	Explicit, Tacit knowledge
	Enhancing corporate image					O	O			O						Explicit, Tacit knowledge
	New product or service promotion			O		O	O	O		O	O		O		O	Explicit, Tacit knowledge
	Learning about customer demand				O		O		O					O		Explicit, Tacit knowledge
Indirect sales purpose	Self-improvement	O					O		O	O			O			Tacit knowledge
	Building relationships with existing and potential business partners	O	O	O	O	O	O	O	O	O	O	O	O	O		Tacit knowledge
	Networking expansion with experts	O				O	O			O			O			Tacit knowledge
	Recognition of market trends	O			O		O	O	O	O		O	O		O	Tacit knowledge
	On-site knowledge sharing	O	O			O	O	O	O	O		O	O	O	O	Tacit knowledge
	Incentive for employees					O				O						Tacit knowledge
	Acquisition of new skills or technical information	O		O	O	O	O		O	O	O	O	O	O	O	Tacit, Explicit knowledge
	Listening to presentations from experts (education)	O	O				O		O	O	O				O	Tacit, Explicit knowledge
	Discussion to solve issues						O		O				O			Tacit knowledge
	Evaluation of products and performance		O				O		O				O	O	O	Tacit knowledge

Source Authors' research

① Hobson (1993), ② Oppermann and Chon (1997), ③ Blythe (1999), ④ Gebarowski and Wiazerwicz (2014), ⑤ Hansen (1996), ⑥ Jung and Choi (2008), ⑦ Kerin and Cron (1987), ⑧ Maskell et al. (2006), ⑨ Mitchell et al. (2016), ⑩ Tanner et al. (2001), ⑪ Sharland and Balogh (1996), ⑫ Morrow (1997), ⑬ Rosson and Seringhaus (1995), ⑭ Rittichainuwat and Mair (2012)

of various information and knowledge have increased, because C&E, especially international C&E, represents places that generate rich information and interactions characterized as a "global buzz" (Maskell et al. 2004, p. 18). It results from F2F interactions that enable the transfer of complex messages, exploration of market trends, problem-solving and idea generation, and network expansion. This helps reduce information asymmetries and uncertainties between KP and KS during interactions and socialization (Tanner et al. 2001; Gertler 1995) and, in turn, engenders trust (Bathelt and Turi 2011; Schuldt and Bathelt 2011).

Now we need to go back to the first and second questions of this study. Even though meeting technology has developed dramatically, why are F2F meetings still the dominant type of C&E? We should think about the role of C&E as a knowledge platform for acquiring and disseminating knowledge. This is explained by types of knowledge, as outlined in the following subsections.

3.1 Tacit knowledge

Polanyi (1966) distinguishes knowledge as tacit and explicit knowledge. The transfer of this tacit knowledge generally requires extensive human contact and trust, like a socialization process. He posits that explicit knowledge that is articulated and expressed is only a small part of all knowledge. Tacit knowledge is constructed and created from people's experiences and understanding of the world. His argument is implied in the sentence, "I shall consider human knowledge by starting from the fact that we can know more than we can tell" (Polanyi 1966, p. 4). Thus, Polanyi emphasizes that tacit knowledge is the foundation of all knowledge to be articulated.

Tacit knowledge accounts for a considerable portion of human activities like facial expressions, gestures, use of terms, or attitudes. It is difficult to separate from the context where it exists (Nonaka and Takeuchi 1995). That is why the spatial proximity or co-location, a so-called "cluster," provides an important process to acquire and share tacit knowledge. A cluster whose feature is spatial proximity or co-location, shares history of relationship through F2F encounters and promotes knowledge, especially tacit knowledge sharing and dissemination. It provides opportunities to learn in organized and voluntary gatherings, as well as abundant knowledge exchanges such as specific information flows, knowledge transfer, and continuous updates (Bathelt and Turi 2011; Bathelt et al. 2004).

Polanyi's dichotomy of knowledge has been extremely influential on knowledge management scholars, including Nonaka (1994), Blackler (1995), and Spender (1996), whose theories regarding the study of organizational competitive advantage are based on the degree of tacitness, organizational level and location (Jasimuddin 2012).

Nonaka (1994) applies Polanyi's knowledge notion to explain the knowledge-creation process by the conversion between tacit and explicit knowledge by establishing the SECI model, a dynamic knowledge-creation process. According to Nonaka and Takeuchi (1995), the four stages of knowledge conversion are like a spiraling process between tacit and explicit knowledge, through which knowledge can be shared and disseminated, and new knowledge is generated. Specifically, "socialization"

involves capturing tacit knowledge through physical proximity (Nonaka 1994). The acquiring knowledge is promoted through F2F interaction shared personal experiences (tacit to tacit). "Externalization" is the articulation of tacit knowledge implemented by meaningful dialogue or collective reflection (tacit to explicit), and "combination" is created by a new product, service, or system knowledge through the connection of other knowledge (explicit to explicit). The process of "internalization" is promoted by learning while experiencing work (explicit to tacit). The SECI model is regarded as a basis for theorizing how 'individually owned' tacit knowledge can be transformed into 'group-owned' explicit knowledge to create an organization's competitive advantage (Rice and Rice 2005).

Blackler (1995) divides knowledge into five groups: embodied, embedded, encultured, embrained, and encoded respectively, in an organization's structures, routines, dialogues, brains, and symbol. Embodied knowledge describes personal knowledge, such as knowledge on which an expert craftsman can act. Embedded knowledge is organizational systematic routinized knowledge. Encultured knowledge is a community of practice that results from interaction. Embrained knowledge is linked to people's conceptual skills and cognitive abilities, and encoded knowledge can be easily transferred among people through signs and symbols (Jasimuddin 2012). Most type of knowledge is related to a tacit dimension that is not easy to acquire without sharing a common context.

Spender (1996) also argues that to understand tacit knowledge, the social component must be considered. These knowledge management theories present as important factors an environment, location, or place where tacit knowledge can emerge, as well as interaction and experience sharing that combine physical and mental conditions to transform it into explicit knowledge.

3.2 Meeting technology

C&E that embraces ICTs or meeting technologies facilitates the exchange of information and knowledge. Potential KP and KS, who are eager to participate in traditional C&E but face several barriers, like physical restrictions, including time, distance, or financial burden, can join an event through meeting technology platforms. Online/virtual events allow people around the world to participate and learn from each other according to a schedule that best suits them in the comfort of their home or office. Beyond this convenience, participants can review presentations they want to examine closely, pause presentations when necessary, and return when they can pay attention once again. It has been found that the process of "explicit knowledge" sharing through online/virtual C&E is efficient. Meeting technologies provide useful environment for knowledge accessibility and storability. They facilitate maintaining relationships, sharing experiences, and self-development even pre and post events.

Despite several studies suggesting that "quasi-real person-to-person socialization" is possible even in online meetings, virtual exhibitions, and other web-based C&E (Panahi et al. 2013; PCMA, UMB Studio and Virtual Edge Institute 2011; Chinowsky and Rojas 2003), it is not able to fully disseminate or convey tacit knowledge

(Hameed et al. 2021; Meetingsnet 2021; Falconer 2006). Most interactions through meeting technologies are low in social presence compared to F2F interaction, which has implications for building trust and network (Wiederhold 2020; Johanessen et al. 2001; McDermott 1999).

In this context, C&E can be said to be a knowledge platform that presents tangible and intangible products and services and provides a place to share and generate knowledge through interaction between KP and KS (Jung 2020a). Considering previous studies, C&E is a venue that activates the interaction between tacit and explicit knowledge, but it can be said that tacit knowledge exchange is much more important (Bathelt and Turi 2011). That is why traditional C&E has continued to exist despite meeting technology advances.

3.3 Knowledge sharing in C&E

The easiest way to promote tacit knowledge sharing is to have proximities or co-location that enhances the dissemination of tacit knowledge by allowing people to access the same observations and engage in same practices (Henn and Bathelt 2015; Bathelt and Turi 2011; Maskell et al. 2004; Porter 1998). Proximity or co-locational characteristics have the advantage of being able to start valuable communication easily and conveniently (Mattila and Enz 2002; Nonaka et al. 2000). C&E is an event that takes place at a certain time and place to share and exchange information and knowledge. Gertler (2003) and Maskell et al. (2004) describe this characteristic of C&E as a temporary cluster. Although it is a temporary gathering, participants efficiently achieve tacit knowledge exchanges by "just being there" (Gertler, 1995, 2003). Because co-location with F2F interaction, increases knowledge creation by reducing the effort needed for intentional visits and increasing the chance of unexpected encounters (Bathelt and Schuldt 2010; Bathelt et al. 2004). In this context, C&E, as temporary clusters, provides an intensive knowledge platform for KPs and KSs to exchange and acquire tacit and explicit knowledge through observations or hints that can allow organizations to think in new ways and to create innovative combinations of existing ideas and competences (Maskell et al. 2006).

As a venue for knowledge creation, C&E implements various programs and builds an environment to effectively create the socializing opportunities that participants want (Rogers 2013). For broader and unanticipated knowledge sharing, C&E organizers provide several informal opportunities for personal interaction through welcome receptions, luncheons, farewell dinners, coffee breaks or tour programs (Jung 2020a; Mitchell et al. 2016). Furthermore, official programs provide intensive knowledge exchange venues, such as "Business Lounges," which facilitate KP and KS to find valuable and suitable business partners systematically (Jung and Lee 2018), and "Agora," a venue for intensive discussion or communication for field issues. Agora means a "gathering place" or "assembly" originated from the ancient Greek-city state, which was used for sharing information on sport and the arts, as well as on business, social, spiritual, and political life (Wikipedia 2021). This concept of Agora was borrowed by C&E; the venue is used to actively encourage F2F interactions through experts' presentations, discussions of issues, and sales

promotions. These programs and venues facilitate valuable tacit knowledge sharing that can be seen, felt, and learned only on-site at C&E. In addition, to facilitating the getting-to-know process at exhibitions, the allocation of exhibition booths is classified and clustered by theme or country basis, so that visitors as KSs can easily access the knowledge they seek (Jung 2019; Jung and Lee 2018; Rinallo and Golfetto 2011). All these programs and activities are carefully designed to facilitate the socialization process at C&E.

Jung and Lee (2016) apply the SECI model to explain the knowledge sharing process in C&E while emphasizing the tacit knowledge sharing through socialization process (see Fig. 1). Based on their study, the process of "socialization" oriented tacit knowledge capturing, is the intrinsic characteristics of C&E that are F2F meeting and observation while sharing the physical environment of time and space. "Externalization" in C&E is the process in which ideas or images that have remained at the level of metaphor or analogy are expressed in concrete concepts, design, draft, or declaration by deep dialogue or discussion in a conference or workshop. The process of knowledge sharing through meeting technologies is explained by the "combination" that is created through email, virtual reality (VR), cyber exhibition, websites, blogs, and other SNS based on the Internet. "Internalization" describes the process of embodied and acquired explicit knowledge as one's own internal knowledge through experience, playing, and simulation activities at C&E.

The C&E industry is becoming more diverse and powerful, as it has become combined with meeting technologies. To fulfill its role as a knowledge platform, C&E offers online tools to match the right information and knowledge for KP and KS, such as PSA (pre-scheduled appointment) or on-site appointment program, so that participants can effectively obtain the desired knowledge before and at events (Jung 2020a). Organizers make C&E an effective knowledge platform by applying these meeting technologies to increase knowledge accessibility and storability as well as efficiency of data collection and processing, enabling KP and KS to efficiently acquire information and knowledge. Moreover, meeting technologies can overcome spatial and social limitations of interaction, so that many more potential
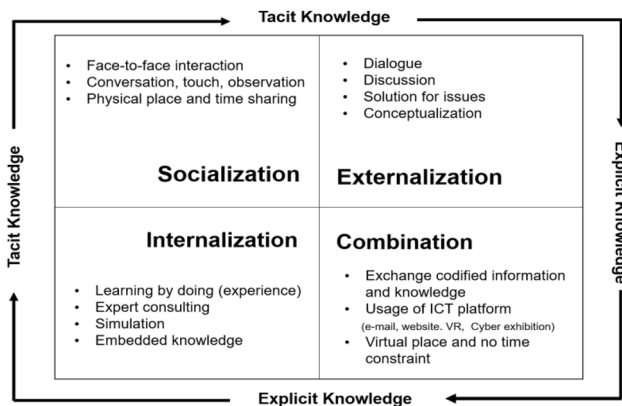

Fig. 1 Knowledge creation in C&E. *Source* Jung and Lee (2016) based on Nonaka (1994)

KP and KS have the opportunity to participate in C&E. However, until the COVID-19 pandemic, meeting technology mainly played the role of helping the acquisition, dissemination, and exchange of knowledge for F2F C&E (Jung 2020a; McDermott 1999).

4 How COVID-19 impacts on the knowledge platform of C&E

In the space of only 2 years, COVID-19 has completely changed human life. Borders have closed and strict social distancing has been required around the world, and radical changes are taking place in almost all aspects of life (Khoa et al. 2021; Prentice et al. 2021; Yang et al. 2021; Zwanka and Buff 2021). The term "Corona new normal" describes the new routines, norms, and standards created by this wide range of changes, and the human race that lives in this environment is sometimes referred to as "Corona Sapiens" (Choi et al. 2020). These environmental changes also have a significant impact on C&E. Prior to the COVID-19 pandemic, the number of C&E events was on an overall upward trend. The "convention industry" had slight fluctuations in the number of events but showed steady growth at an annual average of 0.7% over the past 9 years (see Fig. 2). According to the Union of International Associations (UIA) statistics published in 2020, the number of international meetings held worldwide in 2019 was 12,472, an increase of 11% from the previous year. However, due to the COVID-19 pandemic in 2020, most meetings of the traditional type have been canceled or postponed, following the trend toward so-called "untact," which minimizes or prevents contact between people to block the transmission of infectious diseases based on the World Health Organization's declaration of a pandemic (Bae and Chang 2020; Lee and Lee 2020). Only 4,242 international meetings were held in 2020 (see Fig. 2).

The influence of the "exhibition market" due to the COVID-19 pandemic is examined through the Asian exhibition market. An analysis from 2012 to 2020 by the Global Association of the Exhibition Industry (UFI) and the Business Strategies Group Ltd. shows that the number of trade fairs and the exhibition space sold continuously increased every year (see Table 3). The trade fair industry in Asia grew by 4.8% in terms of space sold in 2019; however, as a result of the COVID-19

Fig. 2 Number of International Association Meetings. *Source* UIA Statistics report (2020a, b, 2021)

Table 3 Trade fair industry in Asia

Year	Number of trade fairs	Net space sold (million m^2)
2012	1948	16.3
2013	2013	17.5
2014	2132	18.6
2015	2202	19.7
2016	2270	20.9
2017	2353	22.3
2018	2424	23.4
2019	2482	24.5
2020	1147	6.8

Source UFI Annual Trade Fair Industry in Asia Report 8th–16th editions

pandemic, it recorded an unprecedented 72.2% drop in net space sold in 2020 compared to 2019 (see Table 3).

Because C&E is characterized by F2F interactions, this inevitably means that the COVID-19 pandemic is a crisis. This crisis has forced a change to an ecosystem in which online meeting technology has to be actively introduced into C&E. ICT-enabled online platforms served as assistants to the traditional C&E and were used as part of the event before the pandemic. Now, online/virtual platforms have come to the fore, and C&E organizers have no choice but to opt for online/virtual events. However, online/virtual C&E cannot fulfill the role of a knowledge platform (Falconer 2006; McDermott 1999). This is because the sharing of tacit knowledge is not smooth (Johanessen et al. 2001). For this reason, C&E organizers are trying to host hybrid events that combine online/virtual and on-site interactions in a way that retains the most important aspects of knowledge exchange.

### 4.1 During the COVID-19 pandemic: from online/virtual to hybrid C&E

To answer the third question, we investigate why hybrid C&E that combines online/virtual and on-site events is becoming the mainstream despite the COVID-19 pandemic.

According to statistics of the International Congress and Convention Association (ICCA 2020), the rates of cancellation and postponement of events were 14%

Table 4 Events by status in 2020

Organization	Canceled	Postponed	Relocated	Unaffected	Virtual	Hybrid	Total event
ICCA	1,211	3,714	73	763	2,505	143	8409
	14%	44.0%	1%	9%	30%	2%	100%

Source ICCA annual statistics study (2020)

Fig. 3 Hybrid C&E configuration
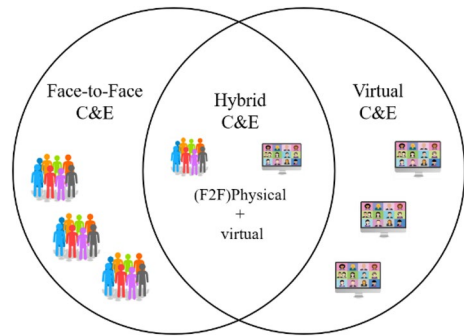
and 44%, respectively. Instead, virtual and hybrid events accounted for 30% and 2%, respectively (see Table 4). Reacting to the sudden spread of the pandemic, C&E organizers have managed to host events in different ways, such as online/virtual and hybrid events.

Online/virtual C&E allows remote participants to access events from their internet connections regardless of locations (see Fig. 3). Participants have no need to get together in a meeting room. It is convenient to deliver and exchange explicit knowledge. However, attendees who have experienced virtual C&E have experienced difficulty with learning and using new technology. They have also gone through technical malfunctions and networks instability in handling increased traffic. Furthermore, there are anxieties and concerns about the overuse of virtual platforms, such as "Zoom fatigue" (Reinach 2021; Nadler 2020; Wiederhold 2020). A survey by Tradeshow Logic (2020) demonstrated that 67% of respondents in a virtual event said that "networking failed" to meet their expectations. Furthermore, 78% of respondents said they hoped to return to complete F2F events. F2F C&E is restarting as social distancing has eased, and is turning to hybrid methods, combined with the online/virtual events.

Hybrid events are mixture of on-site and online/virtual events running simultaneously with overlapping contents and interactive elements (Fryatt et al. 2012; Morell 2010; Parker 2009). They may involve simply gathering session moderators, presenters and small audiences in a presentation studio to deliver the content to online audiences. Speakers can talk F2F and simultaneously interact through the virtual platform with those who are physically unable to attend (Hameed et al. 2021). Holding a hybrid event means generating two versions of the same event. A hybrid event serves two audiences in real-time, who need to converge and feel like one community, as if they are in the same room (Fryatt et al. 2012) (see Fig. 3).

Most event organizers believe that a hybrid solution that holds both F2F and online/virtual events will be a key part of their future event strategy (Meetingspotlight 2020a, b). According to surveys on host intentions for hybrid events, over 95% of event organizers estimate that more hybrid events will be planned and held, and 73% of event organizers will run a hybrid event (Meetingspotlight 2020a, 2021).

"G-Star" would be an example of this situation. G-Star, which stands for "Game Show & Trading, All-Round," in Korea, is an exhibition oriented to F2F knowledge

creation. G-Star is evaluated as one of the world's four major game shows, following Germany's Gamescom, the US's E3, and Japan's Tokyo Game Show. It was estimated that about 244,300 people attended G-Star in 2019, showing a 3.9% increase from the previous year (The Korea Economic Daily 2019). Even though gaming is an online-based industry, they are launching new products through on-site exhibitions and providing participants with opportunities to experience new games exclusively in advance, which is very attractive to exhibition visitors. In addition, exhibitors benefit from immediate feedback on new products or services, allowing them to revise or improve prior to market launch in earnest. In 2020, G-Star did not decide how to host the show until two months before, and in the end, it was held only virtually. This late decision was due to a consideration of the effect of F2F events. According to one of the officials from the game industry,

> "The game show is about playing new games in person, but it's not effective compared to the cost, because we can't gather offline," adding, "There's no reason for game companies to participate in it" (Yonhapnews 2021).

This quotation illustrates why exhibitors and visitors participate in the show. F2F interaction is highly valuable for all C&E attendees, to exchange and obtain tacit knowledge. For this reason, G-Star implemented a hybrid way that maximizes satisfaction for both exhibitors and visitors in 2021. Thus, COVID-19 confirmed the value of F2F events and people are looking forward to the revival of traditional C&E sooner or later. In this context, the third question about the development of future C&E is discussed in more detail in the following section.

4.2 Post COVID-19: on-site, online/virtual, and hybrid C&E—substitutes or complements?

Post-COVID-19, how will C&E be transformed? Will virtual C&E replace F2F events, will the latter be reintroduced, or will we see the emergence of a hybrid mode of C&E? We are experiencing online/virtual C&E that makes it convenient to classify and obtain the information that we need, and can access it anywhere provided the Internet and devices are available. There are no limits in terms of time and space to attend online/virtual C&E. The development of meeting technology and huge investments in information and communication networks are becoming the basis for sharing and disseminating various types of digital knowledge virtually while lowering the distribution cost of coded information. Through virtual platforms, such as webinars, on-demand or live events, VR, AR, and apps, knowledge acquisition, dissemination, and exchange are more activated.

Online/virtual platform opened the door to a revolution of digital engagement that supports and enhances knowledge creation. However, in spite of the efficiency and convenience of information accessibility in online/virtual events, the traditional C&E mode, where F2F interaction takes place, is still people's preferred form (Hameed et al. 2021; Wiederhold, 2020; Jung and Lee 2016; Mitchell et al. 2016; Sarmento et al. 2015). The reason has to do with the perspective of human nature

and the importance of engagement in the knowledge-creation process, as revealed in psychological and anthropological studies (Getz and Page 2020; Kim et al. 2006; Storper and Venables, 2004). By interacting with others, people build trust and expand networks based on tacit knowledge that is expressed by things like gestures, attitudes, tone of voice, the way of speaking, and the terminology they use. This provides a variety of information that would not be available without meeting in person (Sarmento et al. 2015; Panahi et al. 2013). Not only does human interaction counter loneliness, it also produces a variety of synergies in knowledge creation (Hameed et al. 2021). Online expands connectivity, but real relationships can be made F2F interaction. Therefore, virtual C&E has been transformed into a hybrid mode by accepting the need for in-person meetings despite the pandemic conditions.

As F2F C&E reemerges, C&E organizers faces a dilemma. How to arrange events with two radically different attendees? Attendees in physical events have social connectivity, concentration, and high attention. On the contrary, attendees in online/virtual events who can interact only on screens may have short attention spans because of different time zones or limited concentration on the screen. To address this dilemma and facilitate knowledge creation, audience distraction should be minimized, and thus, it is important to engage through live chat function, using emojis, participating in polls, or adding in elements of gamification where appropriate. Through these means, organizers desire to create a milieu where online/virtual attendees can receive engagement, connection, and simultaneity to acquire desired information.

When predicting the future development of the C&E industry, the case of other industries may provide us with good guidance. In Korea, golf is one of the most popular industries, showing steady growth. For online golf, so-called screen-golf was introduced more than a decade ago, many experts predicted that it, or indoor golf, would replace traditional forms of golf or golf directly on the course. However, the prediction was spectacularly wrong. Many people, including young golfers, who could not start playing golf due to time and financial burden, have started and learned golf on-screen, and after a certain time have continued to flow into the traditional on-course golf market (Jeong et al. 2016; Lyu 2015).

This phenomenon can help us to predict the impact of the wide adoption of meeting technology on the C&E market. If C&E virtualization or hybridization continues, the scale of C&E participation is expected to expand. It is expected that participants who have not been able to attend offline events due to time and cost problems will be able to attend online events more easily than F2F events.

Meanwhile, the scale of F2F participation in the hybrid C&E is expected to be reduced. In other words, only those who have a reason or motive to attend on-site events are more likely to attend and the rest are expected to stay online (PCMA 2021). Despite this expectation, online/virtual event participation stimulates the desire to attend F2F events through various socialization motives, for example, deepening networks, securing trust, meeting experts, seeing products directly, and obtaining tacit knowledge through in-depth conversations. Therefore, tacit knowledge exchange or socialization process through F2F contact is still important as one of the core values of C&E.
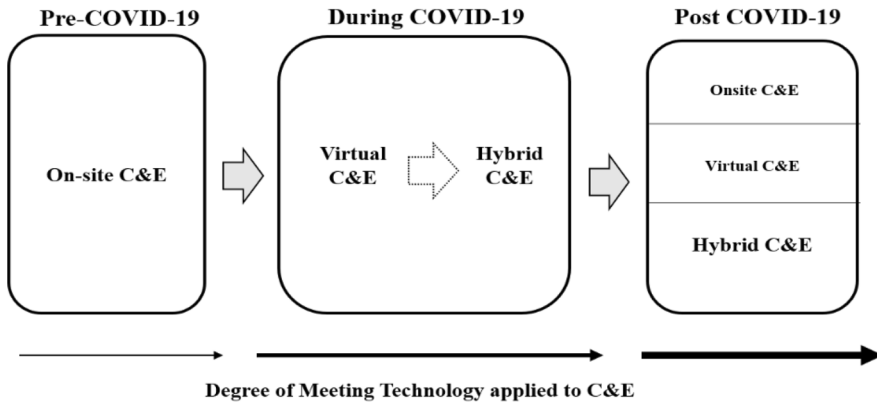
Fig. 4 Changes in C&E mode

Meeting technologies are expected to complement rather than substitute traditional C&E. This is because F2F interaction remains important for acquiring tacit knowledge. Therefore, on-site, virtual, and hybrid forms of C&E are expected to continue to develop to strengthen their role as a knowledge platform, depending on adopting meeting technology to different degrees (see Fig. 4).

Given the above analysis, online/virtual C&E events are unlikely to replace F2F events. On-site, online/virtual, and hybrid events will become a venue for effective knowledge creation according to various environments that require technological application. Hybrid C&E in which more people can participate is expected to become a dominant form of C&E (Hameed et al. 2021; Meetingsnet 2021).

5 Conclusion

This study examined the essential value of C&E as a knowledge platform. Since most important knowledge remains in tacit form (Polanyi 1966), C&E provides a venue for obtaining tacit knowledge where people see, talk, feel, and discuss issues in-depth while sharing time and space. An online/virtual event has its own merit but has a certain limit in transferring tacit knowledge (Tradeshow Logic 2020; Johanessen et al. 2001). As a result, the role of F2F interaction is expected to be strengthened again after the COVID-19 pandemic. However, the traditional F2F form of C&E is likely to evolve into a hybrid mode, which is expected to become the dominant form of C&E. Hybrid C&E would provide an environment in which more people can participate actively, both online/virtual and on-site, attracting more experts and stakeholders in related fields and sharing and disseminating more related knowledge. The hybrid form would expand event volumes and strengthen the role of C&E as a knowledge platform. Hybrid C&E would perform the socialization process on-site and expand the "deeptact" network online (Kukminilbo 2020; The Korea Economic Daily 2020; Kim and Son 2021). In hybrid C&E, an online/virtual platform would enable people to achieve a deeper level of interaction and contact than that with on-site C&E.

An exemplary case that reflects this C&E trend is the Consumer Electronics Show (CES), which has shown a noticeable transition. As the most influential technology event in Las Vegas, the event is expected to change from a virtual-only format in 2021 to a hybrid one in 2022 (CES 2021). The show is collaborating with Microsoft to offer a virtual C&E platform to convene the tech industry F2F and digitally. This platform provides the newest information and trends for global technology leaders on-site and simultaneously for the global audience online. In this regard, an online/virtual C&E will not replace the on-site C&E, but rather complement or expand the C&E itself. Even after the COVID-19 pandemic, as long as socialization for tacit knowing is still a primary concern for people attending events, there will continue to be a reason for C&E to exist as a knowledge-creation venue.

Declarations

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