

## Research Paper

# Conceptualising Event Technology Usage and Experience in Event Management: Thematic Analysis

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**Abstract:** This paper puts forward the idea of using thematic analysis as one of the systematic literature review techniques to explore the use of event technology, particularly in overcoming challenges related to the recent COVID-19 pandemic. A total of 28 articles were reviewed for this study. The articles were collected from Scopus, Emerald and Science Direct. The collected data regarding event stakeholders' behaviour of using technology and development of technology innovations as well as the experience of using technology were categorised based on code, sub-code and main code. The review found a number of factors that are crucial to understanding event stakeholders' behaviour, due to the rising need of technology utilisation during events. However, this paper only elaborates on several themes as highlighted by the researchers. It should be noted deliberating on the role of technology in events is no less crucial than overcoming issues that emerge from the use of event technology during an event.

**Keywords:** Event technology, event experience, events, thematic analysis

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## **Introduction**

Event management has garnered substantial attention amongst researchers and practitioners in the past 30 years as this industry has taken up a major role in the economic and social development of many countries. The US Travel Association reported that the business events industry in the US accounted for USD127.1 billion, consisting of 41.4% of total business travel expenditures (Morrison, 2018). In the UK, business event attendees' spending was estimated at GBP7.7 billion (Eventbrite, 2021). Additionally, business events are significantly one of the most lucrative segments of Australia's tourist economy, with the potential to generate AUD16 billion annually by 2020 (Tourism Australia, 2020). In Asia, for every one additional day, a business event is projected to generate RM466,000 worth of estimated economic impact (Malaysia Convention Exhibition Bureau [MyCEB], 2021).

Moreover, these statistics highlight the importance of business events as one of the biggest economic contributors to the US, the UK, Australia, and the Asia Pacific. The events industry boosts growth and development in terms of infrastructure and facility development at an event venue, generating jobs and enhancing the economic social well-being of the local community. With a total of 1,691 events for the past seven years which delivered an estimated economic impact of RM8.66 billion, Malaysia is on track to drive a positive momentum for the business events industry (MyCEB, 2020). However, the global business events landscape has changed tremendously, and the business event industry stakeholders now face pressing challenges in response to the recent COVID-19 pandemic. In addition, an exponential demand from Generation Z that leans more towards IT literacy (Statnickè et al., 2019) and the pressure from the event tourism that demands for more memorable events (Servidio & Ruffolo, 2016) can be regarded as significant influences as well. Thus, these changes necessitate the need to understand and explore the inclusion of event technology usage and experience in event management.

## **Literature Review**

The demand for use of event technology during an event can be attributed to several factors. The main factor would be the recent COVID-19 pandemic. Coronavirus is a broad family of viruses infecting animals or humans. A newly identified coronavirus found in December 2019 in Wuhan, China caused the first outbreak of COVID-19 (Madray, 2020). After sporadic outbreaks in multiple cities within China, the virus spread rapidly worldwide, and the World Health Organization (WHO) officially declared the COVID-19 outbreak as a global pandemic in March 2020 (World Health Organization, 2020).

This unprecedented event, termed as a pandemic, is regarded as the most challenging crisis in human history the world has ever faced since the Second World War. It was later confirmed that population density and intensity of social contacts were the main drivers for the exacerbation of this pandemic (Rocklöv & Sjödin, 2020). The virus usually spreads through tiny droplets released from the nose or mouth when a person with COVID-19 coughs, sneezes, or talks (Madray, 2020). Consequently, with the ban or restriction on travel and mass gathering as well as the need to maintain social distancing, the business event industry faced immense challenges to survive. Precautionary steps were of utmost importance and were mandated, such as social distancing, keeping at least one metre from others, isolating and treating those infected (respiratory disease), as well as wearing a mask and washing hands regularly. As medical treatment was still unavailable at that time (July 2020), mitigation and prevention was a priority (Ho & Sia, 2020).

The disruptive effects of COVID-19 brought the business events industry to a halt. Hundreds of events were cancelled globally since the outbreak started, hence reports of postponements and cancellations became the new normal (Congrex Team, 2020). The Malaysian Association of Convention and Exhibition Organizers and Suppliers (MACEOS) reported that 1,250 business events in Malaysia were either postponed or cancelled in 2020, resulting in an enormous economic loss of over RM1.75 billion, with several business event companies having zero income since the beginning of the year (Kamel, 2020). The COVID-19 pandemic has also affected the country's tourism sector badly, with only 4.2 million international tourist arrivals and RM12.6 billion in tourism receipts in 2020 (Perimbanayagam, 2020).

MACEOS' President subsequently admitted that COVID-19 has halted the industry's growth. Business events or MICE drew 540,000 international business travellers and contributed RM9.2 billion to the economy in 2019. In addition, MyCEB secured 42 business events for 2020, including MICE events. The events would have significantly drawn in more than 65,000 delegates, mainly from the healthcare, telecommunications, research and technology sectors, adding an approximate RM645 million in revenue (MyCEB, 2021). However, as we all know now, Malaysia's future position as Asia's business events hub was adversely impacted by the coronavirus outbreak (COVID-19) in 2020.

The pandemic was a push factor for event management companies to change their business plans and strategies. Event attendees expect more personal engagement from event organisers, hence hybrid and virtual events seemed to be the rational option during the pandemic (Congrex Team, 2020). In this respect, event technology acceptance among event stakeholders is crucial, otherwise, they would be left behind in today's event changing landscape. However, with increased postponements and cancellations, event management companies had to grapple with low or no income, resulting in financial losses to the events industry (Kamel, 2020).

In this context, new innovations in event technology continue to create changes in the way of events are communicated and delivered. This has, to a certain extent, assisted in reducing the number of event cancellations. Although numerous studies have been conducted on technology, the discussion on the role and demand of technology for events still requires further research. Thus, a systematic literature review was carried out to examine this.

## **Methodology**

There were seven stages involved in exploring the factors that contribute to the demand of event technology utilisation amongst event stakeholders. The seven stages are discussed in subsequent sections.

### **Review Protocol—ROSES**

Exploring articles related to event technology was a smooth sailing process with the help of Reporting Standards for Systematic Evidence Syntheses, commonly known as ROSES. This protocol was developed by Haddaway et al. (2018) to increase the transparency and quality of reviews. Guided by ROSES, the systematic literature review (SLR) process began with the formulation of research questions by applying the PICo method: Problem or population (P), Interest (I) and Context (Co). The next step involved three systematic phases: identification, screening, and eligibility. Throughout these steps, quality appraisal was conducted based on criteria outlined by Mohamed Shaffril et al. (2020). In summary, selected articles were processed through data extraction and data analysis. The data extraction process was guided by the primary research question and thematic analysis was conducted to extract data based on similar themes.

### **Formulation of the Research Question**

Articles were selected using the mnemonic of PICo, which signifies P (Population or Problem), I (interest) and Co (Context) (Lockwood et al., 2015). Based on this concept, the researchers included three main aspects as part of the review: event management (Population), technology (Interest) and value (Context).

### **Systematic Searching Strategy**

There were several processes involved in identification, screening, and eligibility, as proposed by Mohamed Shaffril et al. (2020), that were employed to retrieve the relevant articles.

### **Identification**

Based on the research questions, two main keywords were identified: event management and event technology. The combinations of these keywords were processed using Boolean operators in Scopus (Table 1).

**Table 1.** Boolean operators in Scopus

<b>Database</b>	<b>Keywords</b>	<b>No. of articles</b>
Scopus	Event Technology	56
Scopus	Event Management and Technology	440

### **Screening**

Screening was the second procedure carried out whereby articles were either included or excluded based on a specific set of criteria such as open access, published year (2012 to 2023) and only empirical papers (primary data). This time period was chosen given that the number of published studies was sufficient to perform a representative review. The authors decided to review empirical research papers from Scopus and Emerald database. The keywords used for both databases were “event technology”, “event management”, and “technology”.

### **Eligibility**

The authors manually checked the screened papers to identify (either by reading the title, abstract or the entire paper) whether the papers matched the established inclusion criteria. A total of 53 articles were found using “event technology” and after manual checking, only 10 articles were selected and the remaining 43 were excluded. During the abstract screening stage, all 10 articles were accepted to be included for the systematic literature review due to content that relates to event management.

The authors also checked the papers using the Boolean technique and keywords “event management” and “technology”. As a result, 440 articles were found, and after the screening process for published year and open access, only 99 articles were found related to event management. However, after the eligibility process, only 13 articles were chosen as being suitable with the related topic.

### **Quality Appraisal**

Quality appraisal was performed to ensure that the methodology and analysis of the selected studies were completed satisfactorily. The researchers relied on the assessment criteria such as the relevance of the sampling strategy towards the research questions, the sample’s representation to its population, the appropriateness of the

measurement and the suitability of the articles. Articles retrieved using the selected databases: Scopus, n=19; Science Direct, n=3; Emerald, n=4.

### Data Extraction and Analyses

The articles were thematically analysed, given that the review relied on themes that were revealed from all the articles analysed by the researchers (Refer to Table 2).

**Table 2.** List of articles based on themes

Title of article	Database	Theme	Author(s) and year
Conference mobile application: Participant acceptance and the correlation with overall event satisfaction utilizing the technology acceptance model (TAM)	Emerald	Attendee experience	Talantis et al. (2020)
Recognizing Events 4.0: The digital maturity of events	Scopus	Experience	Ryan et al. (2020)
The impact of artificial intelligence on event experiences: A scenario technique approach	Scopus	Innovation	Neuhofer et al. (2020)
Event market segmentation: A review update and research agenda	Scopus	Experience	Tkaczynski & Rundle-Thiele (2020)
Adapting the technology acceptance model (TAM) for business events: The event organizer perspective	Scopus	Experience	Sangkaew et al. (2019)
The emerging smart event experience: An interpretative phenomenological analysis	Scopus	Experience	Bustard et al. (2019)
Customer-customer interactions (CCIs) at conferences: An identity approach *	Scopus	Experience	Wei et al. (2017)
Smart dissemination and exploitation mobile services for carnival events	Science Direct	Technology usage	Koukopoulos & Koukopoulos (2017)
Meeting planners' online reviews of destination hotels: A two-fold content analysis approach	Science Direct	Technology usage	Boo & Busser (2018)
SNV's modes of ordering: Organizing tourism as development practice	Science Direct	Innovation	Hummel & van der Duim (2016)

**Table 2.** (con't)

<b>Title of article</b>	<b>Database</b>	<b>Theme</b>	<b>Author(s) and year</b>
Designing a digital service to improve the user experience of conference organizers	Scopus	Experience	Abdelnaby & Bertone (2017)
Design and implementation of the intelligent management system of large-scale sports events	Scopus	Innovation	Wang (2017)
Safety and service quality along with technology in mega-sport events	Scopus	Quality experience	Oueslati et al. (2017)
Attendee engagement for academic conferences case study: ATLAS Business Tourism Special Interest Group Conference in May 2019, Porvoo.	Scopus	Attendee experience	Ngo (2019)
Evaluating event effectiveness across alternate platforms	Scopus	Experience	Malek et al. (2018)
Embracing an uncertain future: COVID-19 and MICE in Malaysia	Scopus	Experience	Ho & Sia (2020)
Hospitality business models confront the future of meetings	Scopus	Experience	Lock & Macaulay (2010)
The impact of artificial intelligence on event experiences: A scenario technique approach	Scopus	Experience	Neuhofer et al. (2020)
Research into the impact of technology in the events industry	Scopus	Innovation	O'Connor (2015)
Changing paradigm of meeting management: What does this mean for academia?	Scopus	Technology usage	Sperstad & Cecil (2011)
The Gap of event markets between the US and China — Exploring application prospect of event software in China's hospitality and tourism market	Scopus	Technology usage	Zhao (2010)
Innovation in events management	Scopus	Innovation	Bui & Tam (2015)
Examining event attendee perceptions of self-service technology in event registration	Scopus	Experience	Ye & Olson (2019)
Recognizing Events 4.0: The digital maturity of events	Emerald	Experience	Gerard et al. (2020)

**Table 2.** (cont)

<b>Title of article</b>	<b>Database</b>	<b>Theme</b>	<b>Author(s) and year</b>
Emerging technologies and sports events	Emerald	Technology usage	Petrović et al. (2015)
Perceived importance of ICT-based feature and services on conference centre selection and differences among meeting planners	Emerald	Technology usage	Lee et al. (2012)

In the thematic analysis, article titles were segmented using codes and then, these codes were categorised into themes. Quotations that elaborated the content of the article were identified and were given sub-codes. Similar sub-codes were grouped together to form main codes. The main codes obtained were experience, innovation, technology usage.

## **Discussion**

### **Event Technology Usage**

Rapid economic development and paradigm shifts in the use of technology in event management continuously creates an increasing demand amongst event businesses to remain competitive and to thrive. The economic and social impact of this industry can be observed from its demand and revenue growth in many countries (Mair & Whitford, 2015). Given that this industry supports and contributes to the well-being of a society, it should be taken care by all event stakeholders for long-term viability. In the same way, continuous research should be conducted to understand the industry better. For instance, pull factors of event attendees is a pertinent area that needs to be explored by researchers (Chacón et al., 2017; Kim & Cuskelly, 2017; Mair & Whitford, 2015; Van Niekerk, 2017). This is because understanding the needs of event attendees is vital for event management companies in their strategies for marketing.

Strategising the best marketing approach is closely related to demand and indirectly, return of investment and capital. Apart from this, good cooperation from other event stakeholders is equally important in ensuring the smooth process of organising and conducting events. Of the contemporary research topics in event management, 20.8% of scholars focused on marketing, followed by destination (21.5%) and management (20.3%). Meanwhile, trends, planning, evaluation, technology, education and human resources received far less attention amongst scholars, although these topics warrant further examination.

Planning, human resource and technology, as mentioned by Van Niekerk (2017) were among the basic topics found in event marketing literature. This implies that



these factors are very significant for event management companies to strengthen their marketing strategies. In addition, it is highly crucial to consider exploring all other related factors as well. Nevertheless, the role of technology in events seriously demands further investigation.

It is crucial to understand the alignment of technological evolution, particularly in the context of Events 4.0 (Gerard et al., 2020). In examining the digital maturity of events using the Industry Revolution 4.0 model (IR 4.0), Gerard et al. (2020) created the definition for Events 4.0 (E4.0). They also provided various relevant technologies on the scale of digital maturity. Their study also demonstrated that event attendees are satisfied with their engagement with technology during events. Events 4.0 is defined as an era where events are digitally managed, its digital technology is frequently upgraded, its communication systems are fully integrated, and the digital operations and communication for event delivery, marketing, and customer experience are all optimised. Gerard et al. (2020) also stressed the need for future researchers to study further the engagement of digital technologies in events as they feel that this field is still in its infancy. Naturally, there are research gaps in this field, especially as mentioned by these authors.

### **Event Technology Experience**

The engagement of event technology by users differs based on their experiential level. There are several types of event technology such as the use of mobile applications for event registration (Talantis et al., 2020) and virtual meeting, to name a few. Virtual meeting is seen as the future of meeting events (Lock & Macaulay, 2010), after gaining prominence during the pandemic. In response to the COVID-19 pandemic, the Malaysian government implemented the Movement Control Order, in stages, starting March 2020. The sudden onslaught of the pandemic and the mandated social distancing and movement restrictions forced the events industry to transform physical forms of events to digitalised or virtual ones.

Suffice to say, the events industry's landscape underwent a paradigm shift and embraced virtual events (Ho & Sia, 2020). Accordingly, this gave rise to the adoption of various platforms such as Google Meet, Webex and Skype for virtual meetings. The sudden outbreak of COVID-19 brought the MICE sector in Malaysia to a complete standstill. More than 1,200 MICE events in Malaysia had to be cancelled, postponed or forced to go virtual (Kamel, 2020). Without a doubt, the pandemic became the predominant factor that propelled the need for better understanding of virtual event technology experience among event businesses and stakeholders to ensure the industry continues to survive and thrive.

In regard to event stakeholders, there are several definitions as to who are they are in the events industry. Among these, the one that stands out is by Reid (2011). Event stakeholders can be divided according to primary stakeholders and

also secondary stakeholders, namely the government, community, residents, fire, police department, media, tourism and tourists. Primary stakeholders are employees, volunteers, sponsors, donors, suppliers, spectators' attendees and participants. Understanding the boundaries of event stakeholders is vital to ensuring the success of the industry, especially during the pandemic with regard to handling issues related to customer-customer engagement.

Understanding the user requirements of all event stakeholders is also deemed important as every user group has its own needs and preferences. Therefore, a feasibility study of event stakeholders would be beneficial in understanding their requirements pertaining to event technology.

Event attendees' engagement with event technology can transform human relations, interactions and experiences in the business landscape. While the use of artificial intelligence in processes such as event registration can affect event attendees, in terms of its usefulness and ease of use, the influence of AI in event experience is little understood (Neuhofer et al., 2020). This is to say, research on experience related to technology usage in the events industry is still at a nascent stage (Ryan et al., 2020).

This discourse on user experience is important for event organisers to better understand event technology usage. User experience is related to satisfaction, ease of use and usefulness of the technology. Talantis et al. (2020) used the Technology Acceptance Model to examine the role of event attendees' behaviour. They found that usefulness, ease of use and satisfaction with event technology encouraged event attendees to use them. Among the three factors, usefulness was the main predictor for attitude of using event technology. Hence, it is very important for system developers and event organisers to have a good grasp of attendee requirements and preferences to encourage maximum event technology engagement.

Event technology usage also helps the development of new technologies for the industry. For instance, the use of technologies such as Facebook and Twitter play a vital role as a marketing tool. These promotional tools create value experience that engages the involvement of event attendees (Close et al., 2006).

Additionally, atmospherics, enjoyment, entertainment, escape, efficiency, excellence and economic value are some other technology related factors that contribute to a positive experience and satisfaction amongst event attendees (Amoah et al., 2016). Attendees' satisfaction is related to emotions and feeling during an event. These aspects should be taken into account when adopting new technologies for events to ensure satisfaction among event attendees. Event technology should add value into the elements of customer-to-customer interaction (CCI). The reasons are two-fold, namely i) CCI influences attendees' self-esteem and transcendental experiences (Wei et al., 2017); and ii) reshape the communication exchange (Varadarajan et al., 2010).

The needs and emotions of event attendees should be given due consideration, especially when identifying user requirements for technology. These factors contribute to attendees engaging with event technology, satisfactory experience and subsequently, repeat attendance. There are two reasons, namely (i) event attendees have different motivations than organisers, and (ii) the needs and requirements of attendees are different before, during and after an event (Abdelnaby & Bertone, 2017). This again justifies the need to understand user requirements of event stakeholders and attendees as these factors contribute to satisfactory experience using event technology.

User requirement also depends on the demographics. For instance, most of the younger generation (15 to 20 years old) prefer Twitter and Instagram compared to the older generation (45 to 60). Thus, event organisers or marketers must identify their target audience or market and use the appropriate event technology. In summary, event technology usage is related to emotional experience as well as demographics such as background and age. As research on event technology engagement is still in its infancy, the debate on its experience in the events industry is still ongoing (Ryan et al., 2020).

### **Event Technology Innovation**

The review also revealed several new findings, especially in the introduction of new applications and enhancement of existing applications. The events industry continues to undergo digitalisation due to disruptive innovations and developments in event technology (Flowers & Gregson, 2012). For instance, various applications of artificial intelligence can be found in event bots, ticketing solutions, event apps and applications that assist in engaging customers. Some applications assist attendees in being updated and to speed up operations during an event. Event attendees continue to have higher expectations for personal engagement and organisational value from events. As such, there is a need for new innovations in event technology that can enhance their experience and fulfil their needs and expectations.

Technological innovations have changed communication or delivery of information such as posting on social media. Interestingly, live streaming on YouTube has saved attendees thousands of dollars on travelling costs. The emergence of new innovations in event technology can also be attributed to the ever-evolving demands of event stakeholders and attendees. Satisfaction levels differ as they are based on experience of users (Gerard et al., 2020). Different users have different expectations. For instance, in the case of a sporting event, a TV broadcasting computer system for tracking and visualisation as well as players/team performance analysis are very important for decision making. The emerging demands for sporting events creates opportunity and demand for innovative solutions (Petrović et al., 2015) that are subsequently adopted.

One of the latest technological innovations in event technology is Whova, which is an event management software that combines event registration, attendee check-in, event marketing and event application seamlessly in one place. Another is planning pod which is a web-based planning framework that can help event managers plan an event (Abdelnaby & Bertone, 2017). These new innovations push for a paradigm shift in the approach and thinking of event management, to move away from traditional methods towards more digitalised and systematic processes.

Event technology also includes facilities such as technical support, high-speed internet, wireless connectivity, and e-mail station. These functions are important for event management (Lee et al., 2012). For this reason, it is imperative to conduct regular evaluations to understand attendee behaviour (Jaimangal-Jones et al., 2018). The use of event technology for events has a substantial impact on the tourism industry as well (DiPietro & Wang, 2010). Lastly, a new approach for event management training and education is needed so that its graduates can meet the industry's needs and requirements (Sperstad & Cecil, 2019).

### **Conclusion**

The recent COVID-19 epidemic caused drastic losses and negative implications to the global economy and social well-being. The events industry was one of the hardest hit with thousands of events being cancelled or postponed leading to financial losses, unemployment and business closures. The COVID-19 pandemic transformed the event landscape and market like never before. Post-COVID, the events industry will need to recuperate and adapt to new norms, in particular widespread digitalisation. In this respect, this study contributes to the speedy recovery and rejuvenation of the business events industry by looking at the use and experience of event technology. It should be noted that Events 4.0 could be a breakthrough for the events industry.

This study has taken significant steps towards advancing the understanding of event technology usage and experience in event management. The thematic insights derived from the analysis can inform industry players and stakeholders on growth acceleration and better positioning in the global ranking. These critical insights are also relevant for addressing the lack of technology usage and creative experience among event stakeholders.

### **Implications of Research**

The review has revealed that the utilisation of technology in event management has become increasingly important, particularly in light of the COVID-19 pandemic that has led to widespread event cancellations. By examining the themes that emerged from the findings, namely stakeholder's behaviour in using technology, technology innovations, and the experience of utilising technology, this study provides valuable

insights into the academic, theoretical, and practical implications of event technology in the context of overcoming the challenges posed by the pandemic-induced event cancellations.

### ***Academic Implications***

The emergence of three distinct themes from this study contributes to the academic understanding of event technology usage and experience. Firstly, stakeholder's behaviour in using technology offers valuable insights into the ways in which event organisers, participants, and other key individuals interact with technology during virtual events. Understanding stakeholders' behaviour can help researchers and academics develop models and frameworks that elucidate the factors influencing technology adoption and usage within the event management domain. Moreover, it can facilitate the identification of best practices for incorporating technology effectively into event planning and execution.

### ***Theoretical Implications***

The COVID-19 pandemic necessitated the exploration of alternative platforms and technologies for event management. Consequently, technology innovation has become a critical focus for event organisers who faced constraints imposed by the cancellation of physical events. The identification of technology innovations as a key theme in this study holds significant theoretical implications. It highlights the importance of understanding the dynamics between event management practices and technological advancements, encouraging further research and theoretical development in this area. By investigating how technology innovation impacts event experiences, researchers can expand the theoretical frameworks and propose new concepts to enhance event management practices.

### ***Practical Implications***

The themes uncovered in this study hold practical implications for event management professionals and practitioners. As event cancellation becomes more common due to unforeseen circumstances such as the pandemic, it is important to understand how stakeholders respond and experience when using online platforms such as Zoom, Webex, or Google Meet. Insights gained from this paper can guide event organisers in making informed decisions regarding the adoption and implementation of technology in their events. By recognising the challenges and opportunities associated with technology usage, practitioners can develop strategies to enhance event experiences, ensuring successful virtual and hybrid events in the face of future uncertainties.

In a nutshell, this study has revealed that thematic analysis, which is usually used for transcribing data, can be used as a new method for identifying the

predominant issues discussed by scholars with regard to event management. Several sub-codes were seen emphasised in the discussion by scholars, namely on acceptance, digital maturity, event experience, event issue, entertainization, acceptance, event experience, interaction, usage experience, online usage, benefits, value creation, issue, event marketing, creativity, usability and usage. These key aspects were grouped into several themes: experience, usage and innovation. Therefore, generally all these terms were related to behaviour found in most articles discussed by the researchers. The deliberation on such factors is vital for the future of the global business events industry.

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