UNLV | UNIVERSITY LIBRARIES

Measuring Quality of Virtual Event: Scale Development and Validation

Sung-Eun Kim

MEASURING QUALITY OF VIRTUAL EVENT: SCALE DEVELOPMENT AND

VALIDATION

By

Sung-Eun Kim

Bachelor of Science - Tourism Management
Kyonggi University
2009

Master of Science - Business Administration
Ajou University
2016

A dissertation submitted in partial fulfillment
of the requirements for the

Doctor of Philosophy - Hospitality Administration

William F. Harrah College of Hospitality
The Graduate College

University of Nevada, Las Vegas
May 2021

UNLV | GRADUATE COLLEGE

Dissertation Approval

The Graduate College
The University of Nevada, Las Vegas

April 29, 2021

This dissertation prepared by

Sung-Eun Kim

entitled

Measuring Quality of Virtual Event: Scale Development and Validation

is approved in partial fulfillment of the requirements for the degree of

Doctor of Philosophy - Hospitality Administration
William F. Harrah College of Hospitality

Hyelin Kim, Ph.D.
Examination Committee Chair

Seyhmus Baloglu, Ph.D.
Examination Committee Member

Zihui Ma, Ph.D.
Examination Committee Member

Anjala Krishen, Ph.D.
Graduate College Faculty Representative

Kathryn Hausbeck Korgan, Ph.D.
Graduate College Dean

ii

ABSTRACT

MEASURING QUALITY OF VIRTUAL EVENT: SCALE DEVELOPMENT AND
VALIDATION

by

Sung-Eun Kim
Dr. Hyelin (Lina) Kim, Committee Chair
Associate Professor of Hospitality
University of Nevada, Las Vegas

The unprecedented global pandemic caused by COVID-19 has led to a critical reconsideration of the way humans work and live. In turn, true paradigm shifts are arising across diverse industries based on remote and online communication. Undoubtedly, traditional in-person events are transforming into virtual events through more innovative platforms and safer experiences. The market for virtual events is considerably expanding and promising; thereby, the demand for research on the nature and dynamics of virtual events is increasingly growing. However, research on virtual events and virtual event quality (VEQual) is still in its infancy and has lagged behind, resulting in a lack of understanding of the concept and its measurement. Therefore, to fill the gap in the current literature, the primary purpose of this present study is to develop and validate a psychometrically sound and managerially useful instrument for measuring VEQual.

This paper is divided into five studies that are primarily based on Churchill's (1979) paradigm and include multiple qualitative and quantitative data collections. In Study 1, multiple dimensions and items of the VEQual scale are explored and generated through an extensive review of the literature and in-depth interviews with 20 virtual event attendees and providers. In Study 2, the generated pool of items is systematically screened by nine subject-matter experts consisting of event faculties, PhD students, and event coordinators. In Study 3, the items retained

from Study 2 are analyzed and refined using data collected from 482 virtual event attendees. Study 4 validates and confirms the retained items and dimensions by employing confirmatory factor analysis (CFA) with newly collected data from 500 virtual event attendees. Therefore, this study develops and validates a 35-item VEQual scale that comprises seven factors: vividness, functionality, ease of use, responsiveness, entertainment, fulfillment, and privacy/security. The results confirm that VEQual is a multidimensional variable evaluating various performances of virtual events.

In Study 5, the developed VEQual scale's usefulness is examined; this procedure is called nomological validation. A research framework is proposed based on two grounded theories, social presence theory and the information systems (IS) success model, and tested using a new sample comprising 699 virtual event attendees. A structural equation modeling (SEM) approach was adopted and used to empirically analyze the proposed model. The findings of Study 5 reveal that positive evaluations of VEQual influence positive levels of perceived social presence, satisfaction, and revisit intention, thereby successfully confirming the predictive validity of the developed VEQual scale. In addition, another interesting result is that the level of perceived social presence is a critical factor in determining event attendees' satisfaction and intention to revisit a virtual event.

This study allows both researchers and practitioners to investigate and operationalize a focal concept, "VEQual", and thereby significantly contributes to a better understanding of the measurement of various phenomena related to virtual events. More interesting and specific implications and suggestions for further research are also discussed in this paper.

ACKNOWLEDGEMENTS

It is my pleasure to acknowledge those who have helped and supported me in completing this dissertation. First of all, I would like to express my deepest appreciation to my advisor, committee chair, mentor, teacher, and friend, Dr. Hyelin (Lina) Kim, who has encouraged and supported me to pursue various studies, including this dissertation. I feel extremely fortunate to be your very first PhD student. I have thoroughly enjoyed studying under your guidance over the last three years. Without your continuous consideration and patience, I could never imagine this moment. You allowed me to learn about not only how to conduct valuable research but also how to teach and guide a student as an educator. Undoubtedly, I highly appreciate everything you have done for me during my time at UNLV. I would also like to acknowledge my precious committee members. Dr. Seyhmus Baloglu, it was my sincere honor to have you as one of my advisory committee members. Before joining UNLV, I met you several times through your precious and insightful research papers. In particular, your papers on destination image formation were the foundation of my thesis. In addition, this dissertation could reach an end because of the learning I received from your valuable classes on multivariate analysis. Thank you so much. When I met Dr. Zihui Ma for the first time, I could easily feel how warm-hearted and thoughtful she was. You taught me how an educator cares about students. I am always grateful for your genuine support and encouragement. I have sincerely respected and loved Dr. Anjala Krishen's passion and sincere heart for teaching and research. Primarily, your warm and encouraging dialogues enabled me to regain my confidence and move forward without any hesitations. I truly admire your marketing classes.

I want to say a big thank you to all my fellow doctoral students and alumni for their feedback, cooperation, and, of course, friendship. In particular, I am extremely grateful to my peers and friends Minji Kim, Zhenxian Piao, and Liheng Zhang. Without your help and support,

I could never finish my coursework. Also, my lunchmate, Wenjia Han, my co-author and friend, Samuel Lee, and my grateful peer, Solbi Lee, I appreciate your active participation in the panel review of this dissertation. Special thanks to all who participated in the interviews and expert panel reviews. Their constructive and insightful views significantly contributed to the findings of this dissertation.

Additionally, I would like to extend my gratitude to a few other people who helped in bringing this dissertation project to fruition. Dr. Kyung-Mo Lee and Dr. Sung-Byung Yang, who were my previous advisors at the undergraduate and master's level, respectively, have assisted and taught me to complete this research project by providing abundant help, both academically and emotionally. I also would like to thank Kyung-Sun Kwon for helping me to deal with the statistics involved in this paper and to find appropriate interviewees. There is no doubt that I could not have written down this acknowledgment without the support and consideration of the Gyeonggi Tourism Organization.

From the bottom of my heart, I would like to express my profound gratitude toward my family. This accomplishment would not have been possible without their unfailing support and continuous encouragement until now. I would like to leave my sincere gratitude in Korean for them:

사랑하는 아버지, 어머니. 아들이 여기까지 올 수 있었던 건 두 분의 무조건적인 사랑과 기도 덕분이었어요. 감사해요. 장인, 장모님. 공부할 수 있도록 지원해 주시고 도와주셔서 감사드립니다. 사랑하는 누나들, 매형들, 조카들 그리고 처남과 민혜까지 지난 시간 응원해 주어서 정말 감사합니다. 마지막으로 내게 가장 소중한 아내 보미와 온유, 이루. 아빠가 공부한다고 배려해 주어서 고마워. 특별히 결혼해서 지금까지 공부할 수 있도록 전폭적인 지원과 배려를 아끼지 않았던 사랑하는 나의 아내, 보미에게 지난 시간 너무 고마웠고 사랑한다고 전하고 싶습니다.

Finally, thanks to my way maker, miracle worker, and promise keeper, "My lord." I would like to praise and glorify your unchanging love and endless grace through these little pieces.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1.

INTRODUCTION

Over recent decades, events have become one of the fastest-growing areas in the tourism and hospitality industry (Lee et al., 2017). As events play a major role not only in attracting visitors to the host region but also in contributing to the destination's social and economic well-being, they have been regarded as a core marketing element in the promotion of places (Mair & Weber, 2019). As a result, the interest of the academic community in event research has significantly increased (Mair & Weber, 2019); in particular, over the past decade, a number of research streams have emerged that deal with the nature and dynamics of event planning and management across diverse contexts, such as destinations, business management, and marketing (Park & Park, 2017).

However, the novel coronavirus (COVID-19), which appeared at the end of 2019 and has spread worldwide since the beginning of 2020, has severely disrupted event industries as well as tourism and hospitality areas. Without vaccines and sufficient medical capacity, nonpharmaceutical interventions (NPI), such as international and regional travel restrictions and the prohibition of people from gathering in groups over specific numbers, have been adopted as the principal strategy to deal with this pandemic (Gössling et al., 2020). These restrictions and the fear of putting attendees at risk have considerably influenced the event industry. For example, 87% of typical events (i.e., face-to-face format) that are to be held in the coming months, including the 2020 summer Olympics, have been canceled or rescheduled, as confirmed in April 2020 (Professional Convention Management [PCMA], 2020).

Interestingly, this unprecedented situation leads to substantial demands and opportunities for a new format, i.e., "virtual events." The transformational power of various types of technologies has influenced the design of events and enabled event planners to hold a blended

type of event by fusing real and virtual components (Sadd, 2009). Despite the presence of these evolving technologies, the role of virtual communication technologies has been neglected and limited to supplementary functions within the context of events (Geigenmüller, 2010), since social interaction through physical gatherings of people was considered a core value of events for co-creating experiences (Rihova et al., 2018). That is, it was believed that virtual events could not be substituted for real face-to-face events, as the benefits of the former fail to exceed those of the latter (Adema & Roehl, 2010). However, the coronavirus pandemic has led to a critical reconsideration of the way humans work and live, and remote and online communication technologies have become more widely adopted in the event industry as well as in various other industries (Gössling et al., 2020).

Developed from the literature on virtual marketing and traditional events, the concept of virtual events can be defined as a web-based event that involves people interacting in virtual environments rather than physical places, such as teleconferences and live streaming of entertainment (Geigenmüller, 2010; Getz, 2007; Gottlieb & Bianchi, 2017; Pearlman & Gates, 2010; Stone, 1993). As a new medium, virtual environments, which allow users to communicate and interact anywhere on any occasion (Dahlström & Edelman, 2013; Kozinets, 2002), empower event attendees to overcome geographical barriers and to save their expected expenditure, such as travel fares and expenses on accommodation (Geigenmüller, 2010). Similarly, from the perspective of event providers, virtual events can be hosted at a much lower cost compared to physical ones, and various types of data related to participants can be tracked and managed more effectively (Gottlieb & Bianchi, 2017). Therefore, it is essential to understand the concept of virtual events more comprehensively based on relevant studies and systematic approaches.

Within the context of event literature, consumers' perceived quality has gained significant attention (Cole & Illum, 2006; Moon et al., 2011; Son & Lee, 2011; Yoon et al., 2010) because it is considered to be a key element for hosting a successful event as well as for attracting and satisfying more participants (Wong et al., 2015). In general, consumers' perceived quality allows products or services to be differentiated in competitive markets (Karatepe et al., 2005). More specifically, increasing levels of event quality are expected to be conducive to the attainment of remarkable event performance outcomes, including customer satisfaction and loyalty, higher value, a better image with regards to the event and destination, and higher behavioral intention (Cole & Illum, 2006; Moon et al., 2011; Son & Lee, 2011; Ko et al., 2011; Wong et al., 2015; Yoon et al., 2010). In this regard, the measurement of constructs for virtual event quality (VEQual) carries the utmost importance within the current paradigm of the literature.

As a large volume of business has shifted online through immense technological advances (Madu & Madu, 2002), the concept of electronic service quality (e-service quality) has emerged and drawn substantial attention from the literature (Tsang et al., 2010). While traditional services are likely to focus on the interpersonal contact between customers and service providers' personnel (Sousa & Voss, 2006), e-services deal with all services that are offered in virtual environments (Boyer et al., 2002). As traditional instruments of service quality do not comprehensively reflect the different facets of e-service (Tsang et al., 2010), a growing body of research has focused on developing a suitable measurement of e-service quality and validating its positive relationship with focal constructs (Cristobal et al., 2007; Fassnacht & Kose, 2007; Hammoud et al., 2018; Ho & Lee, 2007; Janita & Miranda, 2013; Kaur et al., 2020; Long & McMellon, 2004). These salient studies laid the theoretical foundation that high-quality

3

e-service leads to valuable outcomes, such as customer loyalty, behavioral intentions, and satisfaction; therefore, e-service quality has been identified as a crucial factor for determining success or failure when firms and organizations deliver services through various online platforms (Santos, 2003). Although considerable research has been published in the context of e-service quality across various disciplines, the understanding of the quality of virtual events has been neglected; more importantly, an appropriate instrument to measure this parameter has not been developed and validated.

Therefore, this research is devoted to filling the gap in the current literature by developing and validating a measurement for VEQual based on Churchill's (1979) paradigm, which has been considered a rigorous and sound scale-development procedure and is commonly used to develop new and better measures in various disciplines for marketing, tourism, and hospitality constructs (Babin et al., 1994; Chen & Huang, 2017; Karatepe et al., 2005). Specifically, this paper is divided into five studies. An initial pool of items for the VEQual instrument is generated through qualitative inquiry in Study 1, and the items are reviewed and screened in-depth by several subject-matter experts in Study 2. Further, in Study 3, the items retained from Study 2 are refined using quantitative data. Study 4 validates the developed items and dimensions using new quantitative data. Finally, in Study 5, the newly developed VEQual instrument is revalidated using a meaningful causal model. Study 5 also provides an insightful and intriguing research model that explains how the new scale can be utilized by linking it to various meaningful variables within the virtual event context based on two grounded theories: social presence theory and the information systems (IS) success model.

The concept of social presence (Short et al., 1976), which refers to the "sense of being with another," has been frequently adopted and utilized across diverse disciplines to understand

and explain customer behavior within technology-mediated environments (Biocca et al., 2003).

According to social presence theory (Short et al., 1976), the effectiveness of a communication medium depends on social presence. In turn, it can lead to a variety of significant outcomes such as satisfaction, attraction, and loyalty in a virtual communication environment (Gunawardena & Zittle, 1997; Lee et al., 2006). Meanwhile, DeLone and McLean (2004) proposed the IS success model, which explains the importance and role of IS's quality components: system quality, information quality, and service quality. The IS success model has been widely used in the e-service context for investigating the effect of customers' perceived quality of new information technology on their attitude, satisfaction, loyalty, and behavioral intentions (Gao et al., 2017; Kim & Hyun, 2016; Lee et al., 2020; Wang et al., 2019).

Social interaction has been considered an essential value within the context of events (Rihova et al., 2018), and events held in fully virtualized environments may be considered a new type of information technology platform from the perspective of traditional in-person event attendees. Therefore, in Study 5, a conceptual relationship related to VEQual was developed and tested empirically based on social presence theory and the IS success model. Consequently, the current research is expected to enable researchers and practitioners to investigate and operationalize a focal concept, namely, "VEQual," thereby contributing significantly to an enhanced understanding of the measurement of various phenomena related to virtual events.

Problem Statement

Objective measurement of event quality is a complex matter because of the unique characteristics of events, such as "spatial-temporal phenomenon and interactions among the setting, people, and management systems-including design elements and the program" (Getz, 2008, p.404). Although seminal work on event quality has been conducted in recent years, most

previous studies on events and festivals have merely adopted instruments of "service quality" that other businesses, such as hotels and restaurants, use to investigate their service quality (e.g., Alexandris et al., 2017; Andersson et al., 2017; Jin et al., 2013). Although events are essentially considered a service because "they consist of intangible experiences of finite duration within a temporary, managed atmosphere" (Getz et al., 2001, p.380), the measurement of service quality in other literature is not sufficiently comprehensive to address the quality construct in the event sector (Tkaczynski & Stokes, 2010; Wong et al., 2015). Therefore, it is imperative to develop a "psychometrically sound and managerially useful instrument" (Karatepe et al., 2005, p.373) to measure VEQual by considering the aforementioned distinctive features of events.

Second, the development of scales plays a significant role as a tool for investigating a contemporary and vital phenomenon that a researcher purports to measure for new knowledge to be created (Kock et al., 2019). Although there have been very few attempts to develop an event quality scale (e.g., Baker & Crompton, 2000; Crompton & Love, 1995), there is a significant limitation, which is found in most tourism and event studies that attempt to develop new scales, that is, the absence of nomological validation (Kock et al., 2019). Newly developed measures are required to be evaluated for their nomological validity, which examines a new scale's usefulness by combining the developed scale and other extant concepts "in a more complete theoretical framework" (Venkatraman & Grant, 1986, p.82). Accordingly, the relationship between VEQual and other significant factors in event literature has not been examined empirically.

Finally, as the technology related to virtual environments has evolved, it tends to increasingly affect marketing and business decisions. In turn, this trend induces a call for research, thereby enabling the understanding of contemporary consumers' perceptions and behaviors toward virtual products and services (Loureiro et al., 2019). However, a critical review

indicates a shortage of studies on the understanding of VEQual and the important antecedents as well as consequences of VEQual. Indeed, there exist only a few relevant studies on areas such as e-travel service (Ho & Lee, 2007), e-service (Lee & Lin, 2005; Parasuraman et al., 2005; Santos, 2003; Udo et al., 2010), virtual education (Barbera, 2004), and e-tailing (Kim et al., 2009). To the best of our knowledge, so far, no studies have directly focused on event quality in virtual environments.

In summary, despite considerable practitioner interest and increasing calls for relevant research (Mair & Weber, 2019; Sox et al., 2017), insights regarding service quality in virtual events remain unknown and predominantly lack measurement capability and empirical validation.

Research Questions

Based on the aforementioned discussion, this research seeks to answer the following questions:

1. What is the nature of VEQual?
2. What are the indicators of VEQual?
3. What are the fundamental constructs explicated by the indicators of VEQual?
4. Does the scale developed for VEQual empirically satisfy the required and acceptable statistical results, such as reliability and predictive validity?
5. Does the newly derived scale for VEQual achieve the incorporation of meaningful nomological validation and theory testing?

Purpose of the Study

The primary purpose of this study is to develop and validate a VEQual scale and to empirically test the VEQual instrument using a meaningful conceptual model. Specifically, the

attributes reflecting the concept of VEQual could help explain consumers' perception of VEQual in a reliable and vivid manner. In addition, this research attempts to analyze the effect of VEQual on social presence, satisfaction, and behavioral intentions to provide a comprehensive understanding of VEQual by responding to the research questions. This current study achieves the following objectives:

1. Develop a VEQual conceptualization and an appropriate measurement instrument.

2. Propose and empirically examine the focal VEQual conceptual relationship using extant factors within the event context.

3. Determine the role of social presence in the virtual event setting.

Significance of the Study

With considerable and increasing practitioner interest, virtual events are expected to be a prolific area of study in the coming years. However, research on virtual events and VEQual is still in its infancy (Suomi et al., 2020) and has lagged behind, resulting in a lack of understanding of the concept and its measurement. This study allows both researchers and practitioners to investigate and operationalize a focal concept called "VEQual," thereby significantly contributing to a better understanding of the various phenomena related to virtual events. More specifically, this study offers important implications, such as follows.

First, the significance of this research lies in that it is one of the first to develop a VEQual instrument and empirically test its usefulness through multiple studies, including qualitative and quantitative approaches. Therefore, the findings of this study provide a foundation for establishing future knowledge on VEQual and extend the theoretical understanding of the VEQual concept by empirically exploring the determinants of VEQual.

Second, there is no general agreement regarding the exact nature or content of event quality dimensions (Wong et al., 2015), including VEQual. As a result, the developed scales help to integrate the fragmented nature of event quality research and provide related literature with a comprehensive understanding of the various phenomena related to virtual events.

Third, this study offers initial insights into the role of VEQual within a critical nomological relationship, including consumer-perceived "social presence," "virtual event satisfaction," and "virtual event loyalty." By integrating the newly developed VEQual scale into important existing variables, this study represents the significance of the new scale to social presence theory and the IS success model in virtual settings.

Fourth, from a managerial perspective, this study provides event managers with detailed information on how to measure and operationalize customers' perceived VEQual. This information can be utilized to build a strategic improvement plan to satisfy virtual event stakeholders, such as event consumers (i.e., attendees) and providers, more effectively and efficiently.

Finally, the practical contribution of this research applies not only to the event sector but also to other sectors, including the tourism and hospitality industries, which are actively planning to utilize virtual environments for their marketing and communication.

Definition of Key Terms

The key terms used in this study can be defined as follows:

- *Virtual event*: a web-based event that involves people interacting in virtual environments rather than in physical places (Geigenmüller, 2010; Gottlieb & Bianchi, 2017).

- *Perceived quality*: customers' evaluation of overall excellence or superiority of a product or service (Yuan & Jang, 2008).

- *Event quality*: an event visitor's perception about the event's overall performance and excellence (Crompton & Love, 1995).

- *E-service quality*: consumers' overall evaluation and judgment of the excellence and quality of e-service offerings in the virtual marketplace (Santos, 2003, p.235).

- *Social presence*: the degree of salience of the other person in the interaction and the consequent salience of the interpersonal relationship (Short et al., 1976, p.65).

- *Attitude toward virtual event*: a summary of experiences resulting in some general predisposition to respond to a virtual event in a consistently favorable or unfavorable manner (Gwinner, 1997, pp.148-149).

- *Virtual event satisfaction*: an affective reaction to participation in a virtual event and to the service offered during the event (Yoshida & James, 2010; Yuan & Jang, 2008).

CHAPTER 2.

LITERATURE REVIEW

In Chapter 1, two main objectives of this study are described: (1) to develop a virtual event quality (VEQual) measurement scale and verify the validity of the derived scale, and (2) to propose and empirically examine a focal VEQual conceptual relationship based on the social presence theory. To fulfill these objectives, Chapter 2 provides extensive literature that shows the theoretical background and the conceptual framework of this study. The literature review consists of seven sections: virtual event environment, service quality measurement in event literature, e-service measurement, virtual event service measurement, social presence theory, IS success model, and the relationship between suggested factors. The first section briefly illustrates the evolvement of the virtual event industry and great potential (importance) of the virtual events market. The second section focuses on the extant measurement of service quality in the context of events. The third section presents a comprehensive understanding of e-service quality measurements to have significant insights for developing a new scale of virtual event service quality. On the basis of the discussions in Chapters 1-3, the fourth section provides an overview of virtual event service quality. The fifth section depicts the fundamental theoretical background and uses of the social presence theory. The sixth section explains the information systems (IS) success model in order to draw a conceptual framework of this study. Finally, the interrelationships between VEQual factors and other focal constructs are explained in the seventh section to develop a conceptual framework for nomological validation of newly developed measures.

Virtual Event Environment

In the mid-1990s, with the explosion of the Internet, virtual communities appeared and started to evolve rapidly over the past two decades (Elliot et al.,2013). As more and more people use the Internet on a daily basis and new attractive technologies make an increasing number of virtual communication channels available such as mobile devices (Gottlieb & Bianchi, 2017), the volume of virtual business has been remarkably expanded, and the format of many businesses has been gradually shifting to online (Madu & Madu, 2002). Businesses have adopted technology mediated-platforms to communicate and promote their products and services to the masses. For example, in the case of a meeting event, although the first video conferencing technology was introduced and commercialized in the market in 1980, indeed, a virtual meeting event was launched in 2002 due to insufficient technologies (Sox et al., 2017).

The word 'virtual' fundamentally indicates virtual reality which is the computer-generated, artificial place where people can interact (Stone, 1993). Getz (2007, p.18) argued that "an event is an occurrence at a given place and time; a special set of circumstances; a noteworthy occurrence." There are a few seminal studies that investigate several specific events such as virtual tradeshows, virtual meetings, and virtual conferences. However, remarkable discrepancy exists regarding the definition of a virtual event between scholary and practical perspectives. For example, Geigenmüller (2010) defines virtual trade shows as web-based platforms where the event atendees, suppliers, and distributers are able to interact and communicate virtually regardless of time and place. In contrast, a virtual event can be also practically defined as "an occurrence of people gathering together where some or all of the attendees are not physically in the same location but are connected in a common environment through the use of computers and internet" (MeetingToday, 2012). Given that this research is subject to fully virtualized events, the

present research defines the virtual event as an event held in a computer-generated virtual environment rather than physical places at a given time for particular purposes.

Traditionally, despite the noticeable evolution of information technology, attention to virtual events was likely to be disregarded because of face-to-face events' substantial benefits (Adema & Roehl, 2010). Arvey (2009) articulated the importance of face-to-face meeting events by describing the several benefits. For example, traditional events are likely to allow event attendees to engage and observe both verbal and non-verbal behavioral styles by providing human contact. Moreover, physical events allow participants to develop strong relationships, transparency, and trust among themselves, subsequently enabling people to obtain and give social support.

Despite the great advantages of a traditional event format (i.e., face-to-face), the current global pandemic situation has significantly affected event business and will fuel the virtual events market growth continuously. Also, virtual events are expected to noticeably evolve as companies and organizations continuously attempt to expand their worldwide footmark, which increases the demand for a technological communication mediated-platform that's enabled to reach more customers without physical boundaries.

Interestingly, the global virtual event's market size was valued at 77.98 billion USD in 2019, which is a more than 4 times increase from 2016 ($ 17.07 billion), and it is forecasted to grow 23.2% annually from 2020 to 2027 (Grand View Research [GVR], 2020). With the current pandemic situation, this forecast is expected to accelerate and exceed more than the anticipated estimate. For example, the virtual events platform '6Connex' argued that the number of virtual events has increased by up to 1,000%, and 52,000 events and subevents have been held on their platform since the start of COVID-19 (Forbes, August, 2020). Virtual events include a variety of

activities, such as video conferencing, live chatting, and live broadcasting. By utilizing not only these activities but also various advanced technologies such as Virtual Reality (VR), Artificial Intelligence (AI), and Artificial Reality (AR), virtual events are rapidly being substituted for traditional physical events (GVR, 2020; Nayyar et al., 2018; Wreford et al., 2019).

Applying virtual technologies to events enables event firms and organizations to recognize and respond to opportunities through new environments, which are more effective and efficient, faster, and have a lower cost (Bengtsson et al., 2007; Gottlieb & Bianchi, 2017). That is, virtual communication technologies allow event providers to build an open, public, and global event platform at a low-cost with a large volume of content to gain real time data and to exploit it with various stakeholders (Gottlieb & Bianchi, 2017). Additionally, by adopting a virtual technologies event firms and organizations can act in response to event attendees' needs and communicate with them in a timely manner, and in turn, lead to increased event participants loyalty (Levy, 2014).

As shown in Figure 1, Getz & Page (2016) classified planned events into four dimensions: business (e.g., convention, meetings, and exhibitions), festivals and culture (e.g., festivals, carnivals, and parades), entertainment (e.g., concerts and award ceremonies), and sports (e.g., professional leagues). In terms of events held in virtual environments, given availability and utilization of virtual environments, virtual business events such as virtual trade shows and meetings have mainly been studied (Geigenmüller, 2010; Gottlieb & Bianchi, 2017; Pearlman & Gates, 2010). For example, Pearlman & Gates (2010) argued that virtual events are innovative and feasible tools that an organization can effectively and efficiently use to achieve its objectives, whereas, the widespread adoption may take longer. Gottlieb & Bianchi (2017) interviewed marketing managers who participated in a virtual trade show, and examined the

drivers for visiting the virtual trade show. The findings of the study indicated that the main

motivations were increasing sales revenue brand awareness and having access to the market

(Gottlieb & Bianchi, 2017, p.24).

In summary, the market of virtual events is considerably expanding and promising, and,

thereby, the demand for research on the nature and dynamics of virtual events is increasingly

growing. Consequently, it is imperative to develop adequate measurements about the

effectiveness of virtual events from the perspective of customers (Gottlieb & Bianchi, 2017).
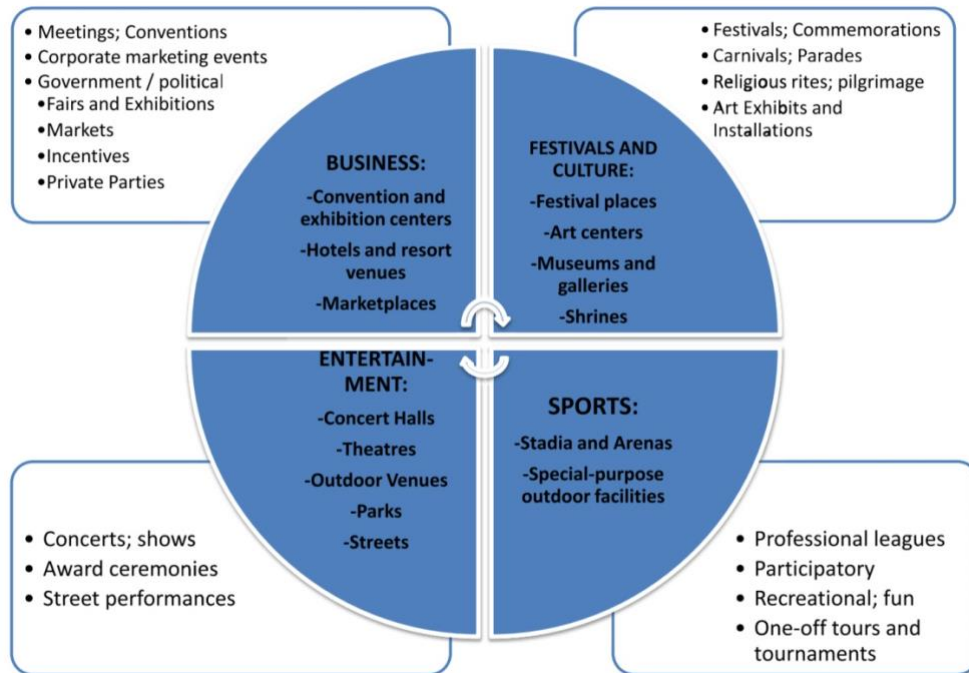
Figure 1. Typology of Planned Events and Venues

Reprinted with permission from Getz & Page, 2016. p.594

Service Quality Measurement

In continually changing global environments and intensifying competition, businesses have started to differentiate themselves to achieve competitive advantage and efficiency, and one of the successful strategies was the delivery of high-quality service (Mei et al., 1999). Given service quality is one of the critical elements in determining firms' and organizations' success or failure, the concept of service quality has received considerable attention from practitioners, and studies on service quality have been published in a massive number of academic journals across diverse disciplines since the late 1970s (Santos, 2003). As a planned event is fundamentally regarded as a sector of the service industry (Getz et al., 2001), most of the extant literature dealing with event quality has commonly employed the concept of service quality and its measurement scale (e.g., Alexandris et al., 2017; Andersson et al., 2017; Jin et al., 2013).

Measuring service quality appropriately is challenging due to the unique characteristics of service areas such as intangibility, heterogeneity, perishability, and inseparability of production and consumption (Parasuraman et al., 1985). There have been two main conceptualizations of service quality in literature: the disconfirmation approach and the performance-only approach. From the disconfirmation perspective, Oliver (1980) introduced a disconfirmation model, and Grönroos (1982) then proposed first the concept of total service quality and argued that it should be measured by the difference between the expectation of service and the perception of service. Therefore, service quality was understood as a measure of how well the service was delivered and matched with customers' expectations (Santos, 2003, p.234). In line with this approach, Parasuraman et al. (1988) introduced the concept of SERVQUAL and suggested that customers' perceived service quality can be evaluated based on five dimensions:

- reliability (the ability to perform the promised service)

- tangibility (the appearance of physical facilities)

- responsiveness (a willingness to help customers)

- assurance (the knowledge and courtesy of employees)

- empathy (individualized attention to customers)

In the study, each item was measured by calculating the difference between the performance of the service and expectation for the service desired. SERVQUAL was regarded as a comprehensive instrument to measure customers' service quality perceptions with significant statistical power such as superior reliability and validity (Parasuraman et al., 1991), the instrument had been applied in considerably various traditional service settings such as bank service, healthcare service, library service, and even tourism and hospitality service (e.g., Carman, 1990; Fick & Brent Ritchie, 1991; Kaynama & Black, 2000; Theodorakis et al., 2001). For example, Theodorakis et al. (2001) investigated the relationship between sport event quality and satisfaction by utilizing the SPORTSERV instrument, which consists of 5 dimensions developed based on SERVQUAL: access, reliability, responsiveness, tangibles, and security.

However, several questions were raised in terms of operationalization of the SERVQUAL scale, namely, limited applicability and inferior predictive validity (Baker & Crompton, 2000, Cronin & Taylor, 1994; Yuan & Jang, 2008). With the criticism in the literature of the disconfirmation approach, the performance (i.e., perception)-only approach has been considered a superior method in measuring service quality (Baker & Crompton, 2000; Bolton & Drew, 1991; Cronin & Taylor, 1994; Crompton & Love, 1995; Dabholkar et al., 2000). For example, Dabholkar et al. (2000) stated that perception measures are better than expectations in terms of higher predictive and explanatory power. They also noted that the perception-only

measure is simpler, more efficient, and has cross-sectional measurement designs from the practitioners. Crompton and Love (1995), who are some of the pioneers of analyzing event quality, assessed the predictive validity of seven alternative operationalizations regarding festival quality: expectations, performance, importance minus performance, performance minus expectations, importance times expectations, importance times performance, and importance times (performance minus expectations), and found that performance-based operationalizations are the most valid measures of quality. Their study also suggested that disconfirmation-based operationalizations such as performance minus expectation were likely to be the least valid measure.

Based on the results of the study by Crompton and Love (1995), Baker and Crompton (2000) examined the relationship of performance-focused service quality and satisfaction (quality of the experience) in the context of a festival. In the study, four dimensions of festival quality (i.e., generic features, specific entertainment features, information sources, and comfort amenities) were suggested as event service quality (Baker & Crompton, 2000). This study provided empirical evidence that perceived performance quality had a more powerful influence on behavioral intentions (i.e., loyalty to the festival and willingness to pay more) than the quality of experience. Further, the findings of their research also suggested that both performance quality and the quality of subjective experience were required to be included in measuring festival service quality; however, performance quality is a more useful and correct measure since performance quality is under the management of service provider. As shown in Figure 2, this study empirically confirms that performance service quality is an influential predictor of satisfaction and behavioral intentions. In this regard, Santos (2003, p.235) defined service quality as an "overall evaluation of excellence and superiority of service performance" and this approach

has been adopted in various service quality studies (e.g., Yuan & Jang, 2008; Fassnacht & Koese, 2006).
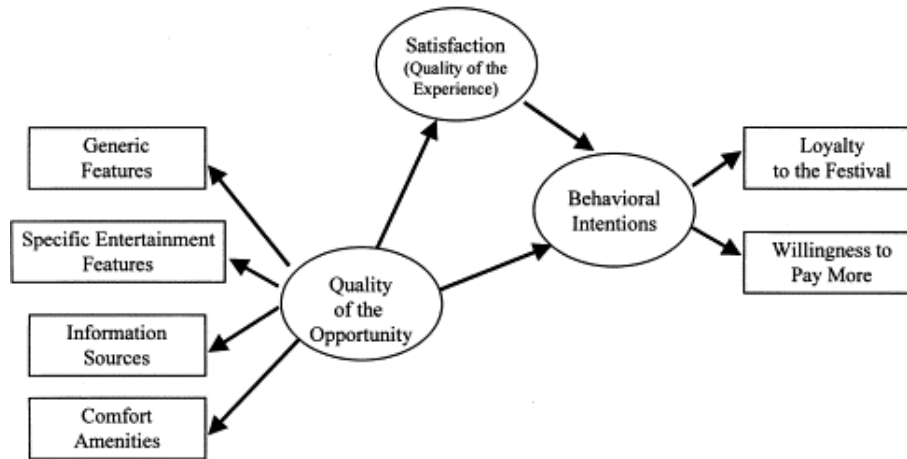
Figure 2. Model of Quality, Satisfaction, and Behavioral Intentions.

Reprinted with permission from Baker & Crompton, 2000, p.791

Oh and Kim (2017) recently reviewed 242 articles dealing with the concept of service quality, customer satisfaction, and customer value, which were published in tourism and hospitality literature from 2000-2015. Interestingly, the findings of the study showed that the direct application of the disconfirmation-based SERVQUAL model has gradually diminished. In other words, "researchers adopted operationalizing service quality through direct ratings by the study participants or customers rather than computing the service quality scores arithmetically" in recent service quality studies (Oh & Kim, 2017, p.19). More specifically, researchers have attempted to develop a new service quality scale by considering context-specific components in various domains such as travel agencies (Caro & Garcia, 2008), rural tourism (Albacete-Saez et

al., 2007), trade shows (Gottlieb et al., 2011), festivals (Tkaczynski & Stokes, 2010), and casinos (Wong & Fong, 2012).

Table 1

Examples of Event Service Quality Measurement

Researchers	Event type	Research focus	Dimensions
Baker & Crompton (2000)	Festival	Festival quality	Generic features, specific entertainment features, information sources, comfort amenities
Gannon et al. (2019)	Festival	Experimental purchase quality	Fun, servicescape quality, escaptism, uniqueness, social congruence
Gottlieb et al. (2011)	Business (trade show)	Service quality	Interaction quality (attitude, behavior, expertise), holistic environment quality (ambient conditions, design, social factors), outcome quality (waiting time, tangibles, valence)
Jin et al. (2013)	Sport	Service quality	Game, interaction, outcome, physical
Jung (2005)	Business (exhibition)	Service quality	Booth management, registration, contents, exhibition and booth attractiveness, booth layout and function, access
Kelly & Turley (2001)	Sport	Service quality	Game experience, Convenience, Showtime, Employee, Facility access, Fan comfort, Price, Smoking
Ko and Pastore (2004)	Sport	Service quality	Program, interaction, outcome, physical environment
Ko et al. (2011)	Sport	Service quality	Game, augment service, interaction, outcome, environment
Son & Lee (2011)	Festival	Festival quality	General features, comfort amenities, socialization
Theodorakis et al. (2001)	Sport	Service quality	Reliability, responsiveness, access, tangibles, security
Wong et al. (2015)	Festival	Festival quality	Interaction, physical environment, outcome, access, program
Yoon et al. (2010)	Festival	Festival quality	Information service, program, souvenir, food, facility
Carneiro et al. (2019)	Festival	Festivalscape	Facilities, design, entertainment
Jang et al. (2020)	Sport	Sportscape	Scoreboard quality, venue aesthetic, layout accessibility, employees, seat comfort, venue cleanliness, wait time

The other main research stream of event quality measurement is to focus on operationalization of the physical surroundings of an event such as atmosphere and design. Bitner (1992) introduced the concept of "servicescape" and argued that the physical environment

of service offerings enables firms and organizations to achieve their marketing goals, significantly influencing customer behaviors and satisfaction. As shown in Figure 3, three key environmental dimensions were provided: (1) ambient conditions, (2) space and function, and (3) signs, symbols, and artifacts. Drawing upon the concept of "servicescape" (Bitner, 1992), event studies have measured the perceived event quality by focusing on eventscape (e.g., Carneiro et al., 2019), festivalscape (e.g., Lee & Chang, 2017; Lee et al., 2008), and sportscape (e.g., Jang et al., 2020). For example, Carneiro et al., (2019) investigated the eventscape of re-enactment events and described three vital components of eventscape such as facilities, design, and entertainment. While facilities is comprised of restroom facilities, cleanness of the site, signposting, parking lots, and rest areas, design includes space and layout of the event venue. Entertainment indicates a component related to the program such as music and live entertainment (Carneiro et al, 2019, p.114). They empirically confirmed that eventscape were significantly associated with event visitors' emotions (i.e., arousal and pleasure), utimately affecting satisfaction and loyalty to the event (Carneiro et al, 2019).
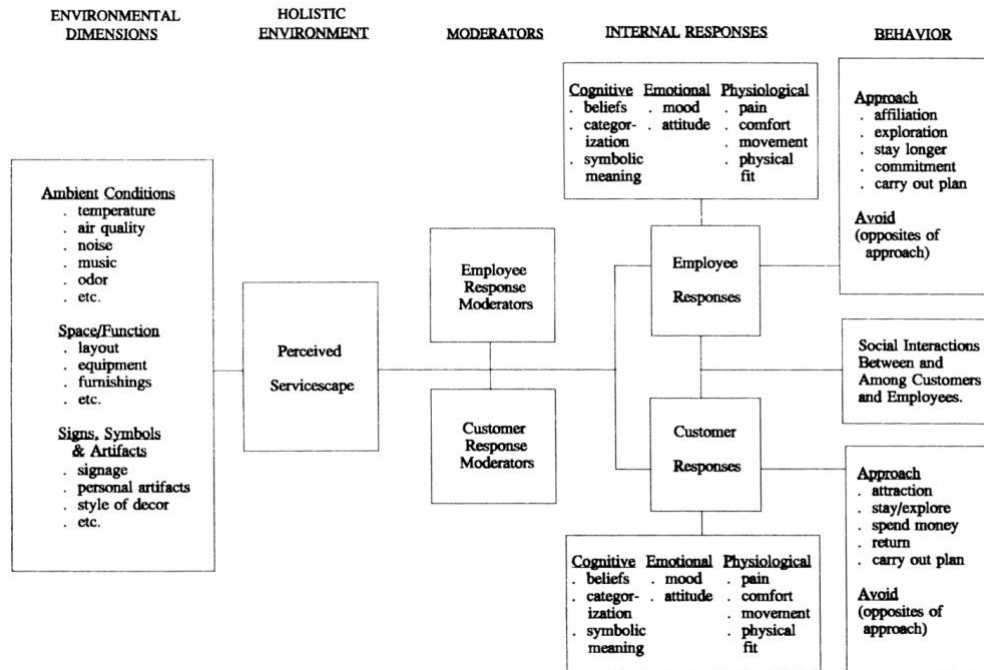
Figure 3. Understanding Environment-User Relationships in Service Organizations.

Reprinted with permission from Bitner, 1992, p.60

In sport events literature, further, since Wakefield and Sloan (1995) initially coined the concept 'sportscape', a number of previous studies revealed that physical environment aspects are essential factors affecting consumers' psychological and behavioral responses (e.g., Balaji & Chakraborti, 2015; Jang et al., 2020; Uhrich & Benkenstein, 2012). For example, Jang et al. (2020) recently examined the interrelationships among sportscape, emotion, and behavioral intention using the four US-based major sports events (i.e. MLB, NBA, NHL, and NFL). They proposed seven components of sportscape (i.e., scoreboard quality, venue aesthetic, layout accessibility, employees, seat comfort, venue cleanliness, and wait time) and the findings showed that to varying degrees, these sportscape factors positively affected the emotion among attendees of all four leagues, in turn, influencing the behavioral intention of customers.

In summary, it might be difficult to argue that measuring event quality is identical to measuring service quality in a traditional event context, since events include various tangible and physical elements such as food, beverages, and souvenirs to sell and give away (Getz et al., 2001; O'Neill et al., 1999). In contrast, it seems intuitively logical to regard a virtual event as an e-service offering as tangible elements are almost eliminated in virtual environments. Besides, traditional event attendees usually face each of the different processes in different places from the beginning (e.g., buying tickets) to the end (e.g., leaving a review). In virtual settings, however, event participants are likely to perceive an event as an overall process and outcome during a single visit to a virtual event platform, which is a precisely identical procedure of e-service (Santos. 2003). Therefore, to extract virtual event quality measurement, the following section deals with and understands the nature and dynamics of e-service quality measurement.

Measurement of E-Service Quality

As the volume of virtual business has remarkably been expanded, and the format of many businesses has been gradually shifting to online (Madu & Madu, 2002), the concept of electronic service (e-service) has been introduced and received considerable attention from literature (Ladhari, 2010). Contrary to traditional services, which embrace interpersonal contact between the customers and service provider's personnel (Sousa & Voss, 2006), e-services indicate all services that are offered on the "internet using advanced telecommunications, information, and multimedia technologies" (Boyer et al., 2002, p.175). Accordingly, e-service quality can be defined as "the consumers' overall evaluation and judgment of the excellence and quality of e-service offerings in the virtual marketplace" (Santos, 2003, p.235). In a literature review study, Ladhari (2010, p.465) summarized the characteristics of e-service quality as follows: (1) convenience and efficiency, (2) safety and confidentiality, (3) absence of face-to-face contact,

and (4) co-production of service quality. Instead of person-to-person interaction, which is considered a vital element in a traditional concept of service quality, e-service quality is measured through the communication between a person-to-information technology-mediated platform. E-service quality is significantly associated with a variety of essential attributes such as customer loyalty (Ho & Lee, 2007), behavioral intentions (Long & McMellon, 2004), satisfaction (Cristobal et al., 2007), and even willingness to pay more (Fassnacht and Kose, 2007). Hence, measuring and evaluating e-service quality becomes increasingly important when firms and organizations deliver services through various online platforms.

Over the last two decades, the study about developing e-service quality measures has been increasingly highlighted across the diverse literature, as shown in Table 2. Ladhari (2010) reviewed numerous studies about e-service quality measurement and found two main streams of current literature: (1) the *ad hoc* use of website parameters and (2) measures of the construct of e-service quality. The first party has attempted to evaluate e-service quality by focusing on the design and quality of websites (e.g., Liu & Arnett, 2000; Szymanski & Hise, 2000). These studies identified multiple relevant factors constituting e-service quality, such as ease of use, information content, system use, site design, system design quality, and convenience. The other researchers (e.g., Ho & Lee, 2007; Fassnacht & Koese, 2006; Parasuraman et al., 2005; Santos, 2003) have pursued the development of a more comprehensive construct of e-service quality by either modifying extant scales or creating new ones, including security, customer relationship, responsiveness, efficacy, privacy, and efficiency.

Santos (2003) proposed a conceptual model of the determinants of e-service quality (Figure 4). In the context of e-service quality, most of the literature was mainly evaluating e-service quality by focusing on the design and quality of the website (e.g., Liu & Arnett, 2000;

Szymanski & Hise, 2000). However, Santos (2003) defined e-service quality as the consumer's overall evaluation and judgment of the excellence and quality of e-service offerings in the virtual environments. This definition embodied not only the assessment of the quality of the website itself but also the service quality delivered by the website. In this regard, Santos (2003) suggested that e-service quality had two key dimensions: incubative and active dimensions. The incubative dimension comprises the design elements of a website (e.g., appearance, linkages, structure, and layout) and website functionality (e.g., ease of use and linkage). In contrast, the active dimension consists of the direct service elements (e.g., reliability, efficiency, support, communications, privacy, and incentives). This salient research has played a significant role as a tool investigating e-service quality and provided a comprehensive foundation for establishing the future knowledge of e-service quality.
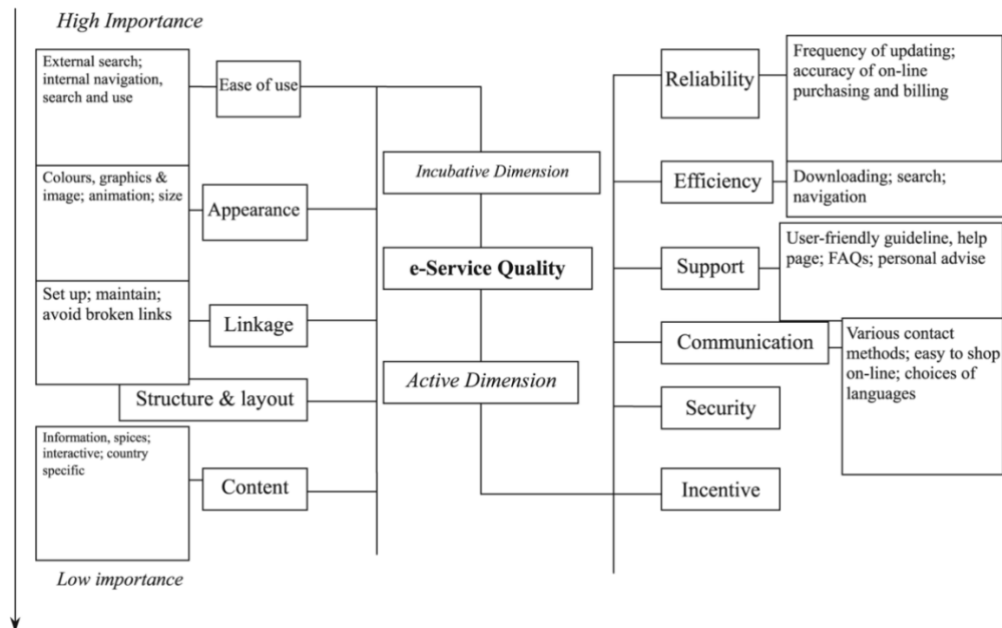
Figure 4. Determinants of E-Service Quality.

Reprinted with permission from Santos, 2003, p.239

Fassnacht and Koese (2006) developed a measurement scale (see Figure 5) that is more widely applicable to diverse electronic services' offerings by testing a large aggregated sample from three different areas such as personal websites, a sports coverage online service, and an online shop for electronic devices. Despite considerable efforts to understand the nature of e-service quality, previous studies were likely to focus on the service delivery process, whereas outcome components of service quality were not paid comprehensive attention (Fassnacht & Koese, 2006). This study argued that e-service quality is different from traditional service quality in terms of the active role of customers in the virtual environment. In other words, when using an e-service, customers usually interact with a technical interface and it induces "a pure person-to-technology service encounter" (p.25). Therefore, customers are required to play a much more active role as co-producers and significantly contribute to the outcome of the e-service delivery. The study emphasized the importance of outcome quality, which is what a customer is left with after service delivery. The outcome quality consists of three subdimensions: reliability (i.e., the extent to which the service provider keeps its service promise), functional benefit (i.e., the extent to which the service fulfills its actual purpose), and emotional benefit (i.e., the degree to which using the service triggers positive feelings) (p.27).
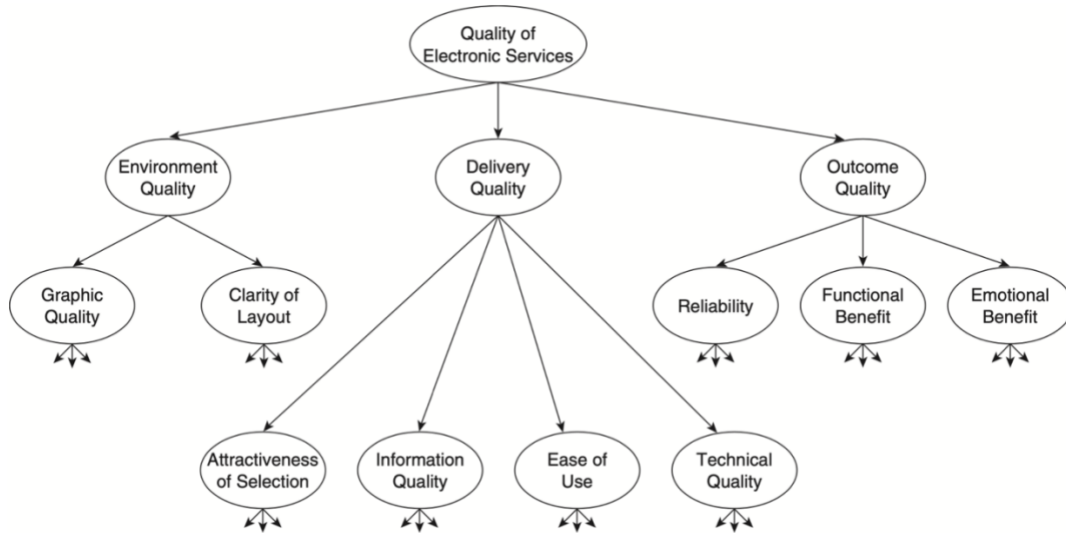
Figure 5. Quality of Electronic Services.

Reprinted with permission from Fassnacht & Koese, 2006, p.27

In the context of hospitality and tourism literature, the majority of existing research dealing with e-service quality focuses on a variety of essential outcomes of e-service quality, such as customer loyalty (Ho & Lee, 2007), behavioral intentions (Carlson & O'Cass, 2010; Long & McMellon, 2004), satisfaction (Cristobal et al., 2007), and trust (Elliot et al., 2013). For example, Carlson and O'Cass (2010) proposed and examined a conceptual model with regard to the interrelationship among e-service quality, consumer satisfaction, attitude towards the website, and behavioral intentions using professional sports websites. Their study empirically confirmed that e-service quality significantly affected consumer attitudes, satisfaction, and behavioral intentions (Carlson & O'Cass, 2010). Further, Elliot et al. (2013) investigated the perceived e-service quality of a virtual travel community environment using C-Trip, one of China's biggest travel agencies. They found that system quality, service quality, and information quality had a positive relationship with member satisfaction and trust (Elliot et al., 2013).

The other primary nature of research within the context of hospitality and tourism areas was the development of e-service quality measurement. E-service's quality scale has been produced in various relevant domains such as hotel websites (Hahn et al., 2017), e-travel (Ho & Lee, 2007), and online travel agencies (Tsang et al., 2010). For example, Ho and Lee (2007) investigated and proposed five core dimensions of e-travel service quality: information quality, security, website functionality, customer relationships, and responsiveness. This study revealed that e-travel service quality is a significant antecedent of customer satisfaction and loyalty intention (Ho & Lee, 2007). According to the findings of the study (Ho & Lee, 2007), website functionality is the most important factor in measuring e-travel service performance from the perspective of customers. In line with the study by Ho and Lee (2007), Tsang et al. (2010) set out to develop a scale to measure the e-service quality of online travel agencies through a qualitative and quantitative approach. They identified six dimensions of e-service quality: website functionality, information quality and content, fulfillment and responsiveness, safety and security, appearance and presentation, and customer relationship. The website study also argued that functionality, which is associated with functions, accessibility, and effective navigation, is the most critical aspect of e-service quality since it significantly predicts customers' satisfaction and intention to repurchase (Tsang et al., 2010).

Table 2

E-Service Quality Scale Measurement

Researchers	Domain of measure	Number of items	Dimensions
Aldwani & Palvia (2002)	Web service quality	25 items	Technical adequacy (9), specific content (6), content quality (5), web appearance (5)
Janda et al (2002)	Internet retail service quality	22 items	Performance (6), access (4), security (4), sensation (4), information (4)
Li et al. (2002)	Web-based service quality	25 items	Responsiveness (6), competence (7), quality of information (4), empathy (4), web assistance (2), call-back systems (2)
Yang & Jun (2002)	E-service quality	25 items	Security (5), responsiveness (5), ease of use (4), availability (3), reliability (3), personalization (2), access (3)
Cai & Jun (2003)	Online service quality	19 items	Web site design/content (6), trustworthiness (4), prompt/reliable service (4), communication (5)
Santos (2003)	E-service quality	23 items	Incubative dimension [ease of use (2), appearance (3), linkage (3), content (3), structure & layout], active dimension [reliability (2), efficiency (3), support (4), communication (3), security, incentive]
Jun et al. (2004)	Online service quality	21 items	Reliable/prompt response (6), attentiveness (4), ease of use (4), access (3), security (2), credibility (2)
Long & McMellon (2004)	E-tail service quality	19 items	Tangibility (7), assurance (3), reliability (3), purchasing process (3), responsiveness (3)
Yang et al. (2004)	Online service quality	20 items	Reliability (3), responsiveness (3), competence (3), ease of use (3), security (4), product portfolio (4)
Lee & Lin (2005)	Online service quality	15 items	Web site design (3), reliability (4), responsiveness (3), trust (2), personalization (3)
Parasuraman et al. (2005)	Electronic service quality	33 items	Efficiency (8), system availability (4), fulfillment (7), privacy (3), responsiveness (5), Compensation (3), Contact (3)
Bauer et al. (2006)	Service quality in online shopping	25 items	Functionality/design (7), enjoyment (4), process (4), reliability (6), responsiveness (4)
Fassnacht & Koese (2006)	Quality of electronic service	24 items	Environment quality [graphic quality (3), clarity of layout (3)], delivery quality [attractiveness of selection (2), information quality (3), ease of use (4), technical quality (3)], outcome quality [reliability (2), functional benefit (2), emotional benefit (2)]
Cristobal et al. (2007)	E-service quality	17 items	Customer service (5), web design (5), assurance (5), order management (2)
Ho & Lee (2007)	E-travel service quality	18 items	Information quality (3), security (3), website functionality (6), customer relationship (3), responsiveness (3)
Sohn & Tadisina (2008)	E-service quality	25 items	Trust (5), customized communication (4), ease of use (3), website content and functionality (6), reliability (5), speed of delivery (2)
Tsang et al. (2010)	E-service quality	34 items	Website functionality (8), information content and quality (6), fulfillment and responsiveness (6), safety and security

			(5), appearance and presentation (5), customer relationship (4)
Ding et al., (2011)	Online self-service quality	13 items	Perceived control (3), service convenience (3), customer service (3), service fulfillment (4)
Barrera et al. (2014)	E-service quality	22 items	Design (3), functionality (4), privacy (3), reliability (5), and recovery (7)
Blut et al. (2015)	E-service quality	16 items	Website design (9), fulfillment (3), customer service (2), security (2)
Hahn et al. (2017)	E-service quality	24 items	Functionality (7), reliable information (4), locality information (4), atmospheric quality (4), customer reviews (3), emotional engagement (3)
Hammoud et al. (2018)	E-banking service quality	15 items	Efficiency (4), reliability (3), security and privacy (4), and responsiveness and communication (4)
Kaur et al. (2020)	E-service quality	24 items	Information quality and usability (7), reliability (5), security and privacy (5), efficiency (3), system availability (3), and assurance (3)

Measurement of Virtual Event Quality (VEQual)

As mentioned earlier, this study relies heavily on a rich and growing literature on e-service quality. While e-service quality has received increased attention across various academic disciplines, including consumer behavior and social psychology, the concept has recently arisen in event literature. E-service quality has been viewed as an essential concept expected to offer the predictive and explanatory power of crucial consumer behavior outcomes such as satisfaction, attitude, and brand loyalty (e.g., Elliot et al., 2013; Ho & Lee, 2007; Tsang et al., 2010). The current study provides an overview of the reviewed VEQual conceptualization proposed in the above discussion, along with the following observations.

First, a number of disciplines have commonly abbreviated perceived quality in virtual environments by using the acronym "e" (electronic), such as e-service, e-learning, and e-commerce (Santos, 2003). However, within the hospitality and event industry, a "virtual event" is often considered a common term that effectively depicts an event held in a computer-generated virtual environment (MeetingToday, 2012). Therefore, it is more presumable to label VEQual as

the e-service quality of the virtual event in terms of pursuing congruence between practical and theoretical usage. The remainder of this study focuses on how to measure VEQual effectively from the perspective of customers.

Second, social interaction and performance-focused service quality are considered the core elements of traditional event service studies. As such, measuring these elements is essential in evaluating service quality in event literature (e.g., Baker & Crompton, 2000; Crompton & Love, 1995; Gannon et al., 2019; Gottlieb et al., 2011; Jin et al., 2013; Ko et al., 2011; Wong et al., 2015). From a service coproduction perspective, customers are likely to compare virtual event services and corresponding traditional event services depending on the degree that fulfills the service effectiveness (Parasuraman et al., 2005). Therefore, the core values of traditional event services (i.e., social interaction and performance-focused service) should be considered adequately in evaluating VEQual.

Third, in the traditional event context, various physical components, including venues, booths, and facilities, are considered crucial factors affecting event attendees' attitudes toward the event and behavioral intentions and are thereby used to measure event quality highly focused on the physical aspects (Carneiro et al., 2019; Jang et al., 2020; Ko & Pastore, 2004; Ko et al., 2011; Son & Lee, 2011; Theodorakis et al., 2001; Wong et al., 2015; Yoon et al., 2010). However, as virtual events are provided through computer-mediated environments, a mere transfer of traditional measures about physical aspects can inappropriately evaluate the quality of the virtual event. Instead, in virtual events, a unified and internet-based event venue is provided; therefore, measuring parameters related to virtual environments, such as website functionality, navigation, and layout, is more adequate and necessary.

Fourth, as shown in Table 2, e-service quality can be viewed as being a multidimensional concept comprising specific dimensions (Collier & Bienstock, 2006, 2009; Dagger et al., 2007; Fassnacht & Koese, 2006; Hahn et al., 2017). Although there has been no consensus on the number of the dimensions of the e-service quality construct developed in previous studies, interestingly, there are some common dimensions (e.g., reliability/fulfillment, responsiveness, ease of use/usability, privacy/security, web design, and information quality) consistently presented by consumers that can be used for measuring e-service quality "regardless of the type of service being delivered on the Internet" (Ladhari, 2010, p.473). These observations can be mirrored in developing the measurement of VEQual. For instance, given that a virtual event is held in a computer-generated virtual environment for particular "purposes," it is extremely important to appropriately measure the extent to which the provided service fulfills the actual purposes and produces the intended outcomes.

Fifth, there has been a debate about "specific" or "generic" measures in evaluating traditional in-person service quality (Karatepe et al., 2005; Ladhari, 2008, 2010). As indicated in the introduction, the current study identified that the dimensions of service quality in event literature are quite different based on event contexts (e.g., festivals, sports, and businesses). This may occur because traditional service (face-to-face) quality evaluation is likely to be determined by different specific contexts (Dagger et al., 2007). However, Zeithaml et al. (2000) asserted that "consumers use basically similar dimensions in evaluating e-SQ (e-service quality) regardless of the type of product or service being evaluated on the Internet" (p.15). In this regard, developing a more comprehensive measurement of service quality in virtual (electronic) environments has been considered a feasible and pragmatic approach (Bauer et al., 2006; Fassnacht & Koese, 2006). Although developing a measurement instrument focusing on a particular event context

may be somewhat necessary, given that studies on virtual events are still in earlier stages

compared with other disciplines, the development of "generic" measures of VEQual is more

likely to be imperative and important. Therefore, this study intends to develop a more widely

applicable VEQual measurement instrument regardless of the type of event by taking a more

comprehensive view.

To develop a reliable and valid VEQual measurement tool, this study was conducted

based on rich and relevant literature dealing with other online service settings. Therefore,

following other salient scale-development studies (e.g., Ho & Lee, 2007; Parasuraman et al.,

2005; Wolfinbarger & Gilly, 2003), some of the dimensions adapted from various e-service

contexts served as a foundation for establishing quality dimensions for virtual events. To further

conceptualize and operationalize VEQual, the author of this study attended or observed several

virtual events, including Korea FINTECH Week 2020 (business event), the K-POP VR concert

2020 (entertainment), and IRONMAN virtual racing (sports event). The components of the

service or program that the virtual events provided were mostly classified into the following

major domains: an interactive virtual event platform (e.g., a website, mobile application,

smartwatch, etc.), event information (e.g., schedule, navigation, etc.), communication with event

participants or providers (e.g., virtual meetings, chatrooms, Q&A, etc.), various multimedia (e.g.,

images, videos, VR, etc.), and entertainment features (e.g., lucky draw, game, etc.). By

integrating relevant dimensions suggested by previous salient studies with these virtual event

service domains, this study proposed nine possible dimensions associated with the measurement

of VEQual.

(Korea FINTECH week 2020)   (K-POP VR concert 2020)   (IRONMAN virtual racing)

Figure 6. Example of Virtual Events

Vividness

Vividness refers to the degree to which formal features of a virtual event present representational richness (Lee et al., 2020; Steuer, 1992; Van Kerrebroeck et al., 2017). Other researchers similarly deal with this concept by differently labeling it as realism or richness (Yim et al., 2017). Advanced technologies have enabled firms and organizations to provide services in a higher level of vividness; in turn, the importance of services' vividness has increased from the perspective of customers (Van Kerrebroeck et al., 2017). In general, vividness consists of two components: breadth (i.e., the number of sensory dimensions and senses a virtual medium can present) and depth (i.e., the quality and resolution of presentation) (Lee et al., 2020). A more vivid representation is more likely to stimulate an event attendee's cognitive elaboration processes (Nisbett & Ross, 1980). According to the findings of a study by Yim et al. (2017), vividness allows users to be immersed; in turn, it affects perceived enjoyment when using augmented reality (AR) as an e-commerce tool. Unlike traditional in-person events, almost all programs and services in virtual events are provided through a virtual platform with multiple imagery, such as videos, images, sounds, and text. Thus, the level of vividness can be an important determinant affecting event attendees' satisfaction and post-behaviors (Coyle &

Thorson, 2001; Lee et al., 2020; Van Kerrebroeck et al., 2017). For example, Lee et al. (2020)

examined the effect of vividness on customers' behavioral intention in the context of virtual

reality (VR) and found that vividness is one of the key determinants to evaluate consumers'

perception toward VR.

Design

Design represents the interface design of the virtual event platform (e.g., images, layout,

multimedia, or colors) (Lu et al., 2009). Tarasewich (2003, p.26) stated that "properly designed

websites help ensure that users can find information that they are looking for, perform

transactions, spend time at the site, and return again." Similar to traditional in-person events, a

functionally and aesthetically well-designed interface environment is more likely to improve the

event quality evaluation (Lu et al., 2009). Without physical event venues, stages, or agents that

can be faced in person, the design of a virtual event platform would be crucial in satisfying event

attendees' expectations (Tsang et al., 2010). In the e-service context, Sohn and Tadisina (2008,

p.909) stated that "as the store's physical environment influences customers' perceived image of

the company, webpage design attracts or deters customers from visiting their webpages." In this

regard, given that the design of a virtual event platform can be compared to an event venue

environment of a traditional in-person event, event attendees may feel spatial presence or

participation in an event through the interface design of the virtual event platform, which would

influence their behavioral intentions. Previous studies have pointed out that the design of a

website or mobile application becomes essential since the quality of the design is positively

associated with consumers' perception and behaviors (Aladwani & Palvia, 2002; Bauer et al.,

2006; Cai & Jun, 2003; Fassnacht & Koese, 2006; Sohn & Tadisina, 2008; Swan, 2001).

Functionality

Functionality can be defined as the extent to which a virtual event uses information technology to provide services that support a core event content or service and to help customers reach their participation goals (Cenfetelli et al., 2008, p.162). Functionality has been considered a representative and essential e-service quality, especially when measuring the system quality of a website or a mobile application across diverse disciplines (Aladwani & Palvia, 2002; Elliot et al., 2013; Ho & Lee, 2007; Tsang et al., 2010). From the perspective of virtual event attendees, functionality would be one of the most significant components when evaluating the overall event quality. This is because regardless of the specific type of events, a virtual event usually provides various functions through a virtual platform, such as live-streamed meetings and videos, two-way communication (e.g., chats), and financial transactions. Therefore, if there is a problem with these functions, the overall event quality can be underestimated. This assertion is consistent with previous studies (Elliot et al., 2013; Ho & Lee, 2007; Tsang et al., 2010). For example, Ho and Lee (2007) found that website functionality is a significant component of e-travel service quality, and Tsang et al. (2010) revealed that functionality significantly affected website users' satisfaction and continued intention toward the website. Further, functionality is significantly related to other e-service qualities, such as ease of use, usability, and/or accessibility (Hahn et al., 2017).

Ease of Use

Ease of use refers to the degree to which a virtual event platform is perceived to be easy to use (Ho & Lee, 2007). This dimension is also a representative category when measuring e-service quality; thus, it has been consistently discussed in many previous studies on the development of e-service quality (Fassnacht & Koese, 2006; Ho & Lee, 2007; Jun et al., 2004;

Ladhari, 2010; Sohn & Tadisina, 2008). This dimension can also be a critical component of VEQual because virtual platforms with various technical functions can be intimidating and complicated to use for many event attendees (Parasuraman et al., 2005). According to the technology acceptance model (TAM), the intention to accept or use a new technology can be determined by its perceived ease of use of technology (Davis, 1989; Davis et al., 1989). Given that a virtual event platform can be considered a new type of innovative technology from the event attendees' perspective, ease of use can become a key component of VEQual. More importantly, since the demographic characteristics (i.e., gender, age, education level, and region) of event stakeholders (i.e., event attendees, sponsors, participants, and supporters) vary considerably, it is crucial to design and operate a virtual event that "anyone" can easily access and use. In the tourism context, Ho and Lee (2007) asserted that this dimension mainly measures three aspects: website navigation, access, and transactional functions. In addition to the dimensions developed earlier (i.e., vividness, design, and functionality), ease of use has been empirically proven to be significantly associated with satisfaction and behavioral intentions in virtual environments (Carlson & O'Cass, 2010, Gu et al., 2009; Nikou & Economides, 2017; Park, 2009; Shao, 2020).

Information Quality

Information quality is measured by "the amount, accuracy, and the form of information" about the programs and services offered by virtual events (Hahn et al., 2017, p.700). When measuring e-service quality, information quality plays a significant role since the fundamental role of e-service is to provide useful, accurate, and timeliness information using a virtual environment (Li et al., 2002). Given that the tourism industry is an information-intensive service industry, the quality of travel information provided by a travel website has also been considered

a crucial component (Ho & Lee, 2007). In the event context, the information quality in a traditional in-person event may not seem as important as that in a virtual event because of physical or face-to-face interaction. In other words, in a traditional event, information can be delivered via various in-person communication channels, including an information desk or event staff. However, as programs and services are usually delivered remotely using a virtual platform (e.g., website or mobile application) in virtual events, accurate and timely information is more likely to be essential and necessary from the perspective of event attendees. Therefore, a salient body of e-service research has commonly revealed that information quality is one of the core dimensions of e-service quality (Hahn et al., 2017; Ho & Lee, 2007; Tsang et al., 2010; Yoon et al., 2010).

Responsiveness

Responsiveness represents a willingness to help event attendees and effective handling of their inquiries and problems (Li et al., 2002; Parasuraman et al., 2005; Bauer et al., 2006). This dimension has been identified as one of the significant criteria by consumers in assessing e-service quality; accordingly, it has been discussed consistently in many e-service quality studies (Bauer et al., 2006; Hammoud et al., 2018; Ho & Lee, 2007; Lee & Lin, 2005; Li et al., 2002; Long & McMellon, 2004; Parasuraman et al., 2005; Yang & Jun, 2002; Yang et al., 2004). For example, according to Lee and Lin (2005), responsiveness is a key determinant influencing overall service quality and satisfaction. Moreover, Tsang et al. (2010) asserted that three attributes—promptness, availability, and timeliness—should be satisfied to improve responsiveness in a virtual environment. In the context of events, an evident feature of traditional events is that "it is dominated by people-delivered services" (Parasuraman et al., 2005). Therefore, an event attendee who has any inquiries or problems regarding the event can easily

38

contact a staff member at the event venue and deal with the confronted situations. However, in a virtual event, as mentioned above, all services and responses are usually delivered remotely using a virtual environment (e.g., website or mobile application); therefore, event attendees in need may find it difficult to communicate with event providers and figure out the problems. Of course, responsiveness is a factor affecting event attendees' overall satisfaction with traditional events (Theodorakis et al., 2001). However, in a virtual event, the level of willingness to help event attendees or effective handling of their inquiries and problems is more likely to be a more critical dimension when evaluating VEQual.

Entertainment

Entertainment represents all elements that promote enjoyment and amusement before, during, and after a virtual event (Elliott & Speck, 2005). Unlike other dimensions, this dimension has not been highlighted frequently in the context of e-service, and only a few studies have dealt with relevant scale items (Bauer et al., 2006; Kim & Stoel, 2004), possibly because many studies on e-service quality have focused on goal-oriented and rational components, which are examples of "utilitarian values" (Bauer et al., 2006). However, as proved empirically as well as conceptually in previous studies (e.g., Baker & Crompton, 2000; Carneiro et al., 2019; Gottlieb et al., 2011), in the event context, entertainment has been regarded as one of the most important components for measuring event quality. Regardless of the type of event, people attend events to pursue not only utilitarian benefits (e.g., effectiveness and necessity) but also hedonic benefits (e.g., entertainment and interestingness) (Gursoy et al., 2006). Even if the specific labeling is different (e.g., fun, playfulness, and enjoyment), the entertainment feature is a critical determinant of event attendees' satisfaction and behavioral intention (Baker & Crompton, 2000;

Flowers & Gregson, 2012). Therefore, this dimension can play a critical role in the context of virtual events as well, affecting event attendees' perception and behavioral intentions.

Fulfillment

Fulfillment refers to the degree to which a promised service is performed in an accurate and timely manner and delivered as desired (Yang & Jun, 2002). Therefore, this dimension is often known as "reliability" or "credibility" (Yang & Jun, 2002; Wolfinbarger & Gilly, 2003; Bauer et al., 2006) and relies on the evaluation of timeframe, service/product delivery, and item presentation (Ding et al., 2011). In the e-service industry, to retain customers, delivery accomplishment of purchased services should be ensured (Wolfinbarger & Gilly, 2003), as it subsequently affects customer satisfaction and loyalty (Ding et al., 2011). Therefore, fulfillment has been highlighted in numerous studies on e-service quality as a representative and prominent component (Ding et al., 2011; Fassnacht & Koese, 2006; Ho & Lee, 2007; Parasuraman et al., 2005; Tsang et al., 2010). Within the context of traditional events, the level of perceived fulfillment of event attendees is closely related to event satisfaction (Kim et al., 2010; Wong et al., 2015). As discussed earlier, a virtual event can be defined as an event held in a computer-generated virtual environment rather than physical places "at a given time for particular purposes." In other words, people attend a virtual event to fulfill their particular purposes (e.g., meeting people, acquiring information, enjoying oneself, etc.) by using provided programs and services as scheduled; in addition, event attendees can use these purposes to critically evaluate VEQual.

Privacy/Security

Privacy and security refer to the degree to which a virtual event is perceived by consumers as protecting personal and financial information from intrusion (Parasuraman et al.,

2005). Perceived risk and fraud in virtual environments has been increasing (Ladhari, 2010). In addition, this is a common dimension that is frequently used for assessing e-service quality across different sectors, such as online banking, retail service, and hotel service (Hammoud et al., 2018; Janita & Miranda, 2013; Kaur et al., 2020; Parasuraman et al., 2005; Ting et al., 2016; Wolfinbarger & Gilly, 2003). Security has a significant impact on consumers' continuance intention, such as intention to revisit and repurchase (Hammoud et al., 2018; Yoo & Donthu, 2001). According to Flowers and Gregson (2012), privacy and security are also major concerns and risk factors that event attendees commonly have when participating in a virtual event. Compared to traditional in-person events, before and during a virtual event, people are more likely to be asked to provide their personal information, including name and contact information (e.g., email and phone number) for RSVP, financial information (e.g., credit card) for transaction, and self-image or video through virtual communication tools (e.g., Zoom). Therefore, privacy and/or security can become a more crucial aspect related to the performance of an event held in a virtual environment.

Social Presence Theory

With increased social usage of virtual communication technologies, the concept of presence has significantly contributed toward understanding social behavior in technology-mediated environments. As the effectiveness of virtual environments mainly depends on the sense of perceived presence by an individual (Witmer & Singer, 1998), recent research associated with virtual environments has frequently utilized the concept of presence across various disciplines, such as education (Garrison, 2016), business (Bickle et al., 2019), and tourism (Wei et al., 2019). There are two interrelated phenomena for explaining the concept of presence: telepresence (i.e., spatial presence or physical presence) and social presence. Spatial

presence frequently indicates a sense of "being there," whereas social presence is a sense of "being with another through a medium" (Heeter, 1992; Biocca et al., 2003). Compared with the notion of spatial presence, social presence has been considered an essential aspect of technology-mediated interaction in terms of the representation of sentient others in virtual communication environments (Biocca et al., 2003). Earlier formats of text-based computer-mediated communication allowed users to access and use a limited amount of verbal and non-verbal information; accordingly, it induced a low level of social presence that people could perceive (Oh et al., 2018). However, recent advancements in information communication technologies (ICT) have enabled media to be much more immersive, and it has affected perceptions of social presence in various virtual environments (Oh et al., 2018).

Short et al. (1976) initially proposed social presence theory and defined social presence as "the degree of salience of the other person in the interaction and the consequent salience of the interpersonal relationship" (Short et al., 1976, p.65). Interestingly, several studies have been conducted following the study by Short et al. (1976), and researchers from different areas have defined social presence differently. According to Biocca et al. (2003), the literature on social presence defines it based on three vital elements: co-presence (i.e., sensory awareness of the embodied other), psychological involvement, and behavioral engagement. For example, Sallnäs, Rassmus-Gröhn, and Sjöström (2000) stated that social presence is the feeling of being socially present with another person at a remote location. Garrison (2016, p.79) argued that social presence is "the ability of participants to identify with a group, communicate openly in a trusting environment, and develop personal and affective relationships by way of projecting their individual personalities."

As postulated in social presence theory, intimacy and immediacy, which are two crucial factors consisting of social presence, play a significant role in determining the perception of a person as a real person through a communication medium (Bickle et al., 2019; Cui et al., 2013; Short et al., 1976). "Intimacy is a function of eye contact, proximity, and topic of conversation," whereas "immediacy is the psychological distance between communicator and recipient… is generated verbally and non-verbally" (Tu, 2000, p.28). Argyle and Dean (1965) maintained that the level of intimacy was sustained at an optimal level through verbal and non-verbal responses such as eye contact, physical proximity, and the amount of smiling. Wiener and Mehrabian (1968) stated that immediate social responses allow communicators to reduce psychological distance. In a virtual environment, intimacy and immediacy would be increased if users and participants could see and hear each other by using cameras and audio, since verbal and non-verbal responses could be identified immediately (Bickle et al., 2019). Therefore, while synchronous video-mediated communication increases the level of social presence, asynchronous and text-based communication leads to a low level of social presence (Whiteside et al., 2017).

Social presence theory has been utilized to understand how technology-mediated environments could influence, alter, and enhance social cognition and the study of its effects on consumers' attitudes and behaviors in virtual environments (Biocca & Harms, 2002; Osei-Frimpong & McLean, 2018). More specifically, previous studies have shown that social presence leads to a variety of significant outcomes, such as satisfaction, attraction, and loyalty in a virtual communication environment (Cyr et al., 2007; Gunawardena & Zittle, 1997; Lee et al., 2006; Song & Hollenbeck, 2015). Gunawardena and Zittle (1997) examined the effectiveness of social presence as an influential antecedent of overall user satisfaction in a computer-mediated environment. They suggested that the higher the sense of social presence perceived, the greater

43

the satisfaction was produced. Cyr et al. (2007) proposed an e-loyalty (i.e., customer loyalty in an online environment) model and empirically examined the impact of perceived social presence on e-loyalty in an online retail market. The results of the study provided empirical evidence that customers' loyalty in a virtual environment is influenced by the level of perceived social presence directly and indirectly through trust, perceived usefulness, and enjoyment (Cyr et al., 2007). More recently, the value of social presence was investigated in a mobile communication setting (Song & Hollenbeck, 2015). Although social presence is considered an important proxy for emotional exchanges in traditional (i.e., face-to-face) interaction, social presence cues lead to positive experiences and "improve customers' overall attitudes toward the firm" in virtual interactions by adding human warmth to mobile messages (Song & Hollenbeck, 2015, p.628).

In the planned event context, event participants' satisfaction and loyalty are formed by various social interactions among consumers, staff/volunteers, management systems, and other visitors (Getz, 1997; Getz et al., 2001). Therefore, social interaction through physical gatherings of people was considered a core value of the planned event for the co-creation of experiences (Rihova et al., 2018). As social presence embodies social interaction in virtual environments (Osei-Frimpong & McLean, 2018), an individual would perceive a higher level of social presence by participating in and experiencing a virtual event, "which is designed with functional and perceptual resemblance" to an actual physical event (Wei et al., 2019, p.283). Therefore, the level of social presence is a vital component in determining the success or failure of a virtual event.

IS Success Model

The IS success model (DeLone & McLean, 1992) is an IS theory that provides a comprehensive understanding of IS success by analyzing and explaining the interrelationship

among multiple essential dimensions used to assess IS (Seddon, 1997). Based on a review and integration of 180 IS studies, DeLone and McLean (1992) proposed an extensive classification that includes six significant aspects of IS success: system quality, information quality, use, user satisfaction, individual impact, and organizational impact. Each component comprises multiple constructs and measures. In technical data processing, system quality is mainly related to system performance, whereby information quality represents the user's perception of information that has a more personal characteristic (DeLone & McLean, 1992). This model suggests that both system quality and information quality positively influence customers' use and satisfaction, thereby affecting individual impact and organizational impact. They maintained that the six IS success components should be combined systemically when measuring IS success.

There have been continuous arguments that service quality could be a vital component of IS success (e.g., Kettinger & Lee, 1994; Myers et al., 1997) because IS firms or organizations fundamentally have a dual role as not only information providers but also service providers (Kim & Hyun, 2016). Considering the continually changing IS environment (e.g., the appearance of the e-commerce world), DeLone and McLean (2004) altered the original IS success model (DeLone & McLean, 1992) by adding service quality and replacing individual and organizational impacts with net benefits, as shown in Figure 7. They stated that service quality is the overall support offered by service providers in virtual environments, and it became a more critical dimension since the level of service quality is significantly related to customer relationship and revenue (i.e., net benefits) (DeLone & McLean, 2004). In this regard, this salient model could be expanded to understand and explain the identification and specification of general e-service success metrics.
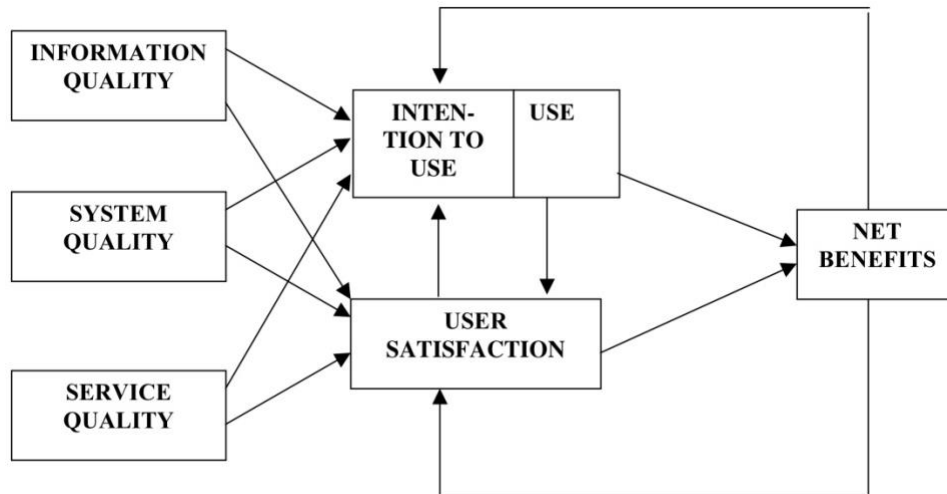
Figure 7. IS Success Model.

Reprinted with permission from Delone & McLean, 2004, p. 33

As a representative IS assessment theory, the IS success model has been frequently used

in a large amount of research on management ISs (Halawi & McCarthy, 2006). Within the

tourism and hospitality context, the IS success model has contributed to understanding a user's

adoption and uses of new information systems, especially in virtual environments, such as online

shopping (Wang et al., 2018), mobile applications (Wang et al., 2019), AR (Kim & Hyun, 2016),

virtual travel communities (VTCs) (Gao et al., 2017), and VR (Lee et al., 2020). For example,

building upon the IS success model and flow theory, Gao et al. (2017) investigated the

relationship among beliefs, attitudes, and continuance behaviors in a virtual travel community

(VTC). They found that system quality and information quality directly affect flow experience

and VTC member satisfaction, ultimately determining site stickiness and word-of-mouth

behavior. Kim and Hyun (2016) examined the impacts of IS qualities (i.e., system, information,

and service quality) of smartphone-based AR on usefulness, telepresence, and behavioral

intention. Telepresence (known as spatial presence or physical presence) generally indicates a

sense of "being there" in a virtual environment (Heeter, 1992). Kim and Hyun's (2016) study is worthwhile in terms of providing empirical evidence that system quality and information quality are influential predictors of telepresence in a virtual environment and ultimately affect users' behavioral intention.

In line with Kim and Hyun (2016), more recently, Lee et al. (2020) investigated multiple quality factors (i.e., content quality, system quality, and vividness) of VR and their effects on customers' behavioral intention using a VR-based destination website. Content quality indicates the quality of the information offered by VR, and system quality refers to the quality of the system that is available to users in both mobile devices and web browsing services (Chen, 2013; Lee et al., 2020). In addition, vividness can be presented as the representational richness of formal features in a technology-mediated environment (Steuer, 1992). The study found that content quality, system quality, and vividness have a significantly positive relationship with customers' attitudes toward VR and the level of perceived telepresence, ultimately affecting behavioral intention (Lee et al., 2020).

The IS success model has been highlighted in examining customers' IS adoption and use behavior and has recently been used to explain customers' perception and behaviors in new realms of digital technology, such as VR and AR (Gao et al., 2017; Kim & Hyun, 2016; Lee et al., 2020; Wang et al., 2019). From the perspective of traditional event attendees, events held in fully virtualized environments may be considered a new type of information technology platform. However, the application of the IS success model has been underexplored in the context of virtual event literature. Building upon the aforementioned discussion, the IS success model can contribute to analyzing and understanding virtual event participants' IS adoption behavior and its effects on the net benefits (e.g., satisfaction and loyalty to a virtual event).

Moreover, as revealed by previous studies (e.g., Lee et al., 2020; Kim & Hyun, 2016), the sense of presence can also be a key component in explaining the adoption and uses of new information systems in virtual environments. In this regard, the IS success model can provide a significant theoretical foundation for virtual event literature and induce the following focal relationships.

Relationship between the VEQual and Other Focal Constructs

As discussed above, VEQual is expected to play a key role in the nomological net of important conceptual relationships (Ladhari, 2010). Drawing upon two focal theories—social presence theory and the IS success model—the current study explains the interrelationship between VEQual and other focal constructs and proposes a conceptual framework to test the nomological validation of VEQual.

Satisfaction

Customer satisfaction, which is defined as a summary of the affective reactions of customers to a service's offerings (Oliver, 1980), has been considered an important consequence of e-service quality. Specifically, if the delivered virtual event service is assessed as a high-quality service, event attendees' satisfaction generally arises subsequently. The considerable extant research provides empirical evidence for this statement (e.g., Carlson & O'Cass, 2010; Cristobal et al., 2007; Elliot et al., 2013; Ho & Lee, 2007; Jung et al., 2015; Tsang et al., 2010). Customer satisfaction has also been viewed as one of the most important constructs to measure in marketing literature because of its beneficial behavioral outcomes, such as positive word-of-mouth, intent to revisit/repurchase, and customer loyalty (Carlson & O'Cass, 2010; Lee & Lin, 2005; Spreng et al., 1995). Extant studies, for example, Lee and Lin (2005), have investigated 297 online consumers and empirically validated the positive relationship between e-service quality (e.g., website design, responsiveness, and reliability) and customer satisfaction. Further,

customer satisfaction is significantly associated with customer purchase intentions (Lee & Lin, 2005). In the context of event management, Lee et al. (2008) provided empirical evidence that festival attendees' perceived quality (e.g., program content, facility, and food) had a significant positive impact on their satisfaction with the festival. Delone and McLean's (2004) IS success model supports the relationship between e-service quality and customer satisfaction. They argued that three types of perceived IS qualities are the important antecedent of customer satisfaction, ultimately affecting behavioral intentions such as intention reuse. This assertion has been tested and empirically validated by numerous studies (e.g., Gao et al., 2017; Kim & Hyun, 2016; Lee et al., 2020; Wang et al., 2018, 2019). Therefore, this study proposes its first hypothesis.

H1. VEQual has a significant positive influence on virtual event satisfaction.

Revisit Intention

Customers' satisfaction has been commonly evaluated as one of the most preferred measurement constructs to explain revisit intention (Kim et al., 2010; Um et al., 2006; Yoon et al., 2010). In the context of event management, event attendees' revisit behavior has been considered a primary concern since events are highly reliant on repeat visitors in terms of seasonally or periodically recurrent events (Choo et al., 2016; Lee et al., 2009; Yoon et al., 2010). Regardless of various event types (e.g., festivals, cultural events, or business events), repeat visitors are regarded as a key asset of events since they are more likely to speak positively about the events, pay less attention to competitors' offers, visit the same destination, and have loyalty about the events (Choo et al., 2016; Hume & Mort, 2010; Lee et al., 2009). Moreover, in the e-service marketing literature, considerable research has proven that revisit intentions are influential outcomes of perceived quality and satisfaction (e.g., Carlson & O'Cass, 2010; Loiacono et al., 2002; Rita et al., 2019). For example, Carlson and O'Cass (2010) investigated

the perceived e-service quality of 518 consumers using a professional sports website and found that e-service quality affects positive levels of consumer satisfaction and attitude toward the website, ultimately influencing behavioral intentions, such as intention to revisit the website and word-of-mouth. Rita et al. (2019) recently investigated 355 Indonesian online consumers to empirically confirm the interrelationship between e-service quality, customer satisfaction, and customer behavior in the context of online shopping. They found that e-service quality had a significant impact on customer satisfaction, ultimately affecting intention to revisit and repurchase. Building on the above discussion, this study proposes the following hypotheses.

H2. VEQual will have a significant positive influence on revisit intention.

H3. Virtual event satisfaction has a significant positive influence on revisit intention.

Social Presence

As mentioned earlier, social presence refers to "the degree of salience of the other person in the interaction and the consequent salience of the interpersonal relationship" (Short et al., 1976, p.65). Previous studies have demonstrated that customers' perceived quality influences the level of social presence in virtual environments (Kim et al., 2011; Oh et al., 2018; Wei et al., 2019). For example, Oh et al. (2018) reviewed 152 published articles dealing with the construct of social presence and investigated various influential antecedents of social presence. They found that the diverse perceived quality of virtual environments, such as immersive qualities, website qualities (e.g., visual representation and audio and display), and contextual qualities (e.g., social cues and agency), were influential predictors of social presence. In the context of education, Kim et al. (2011) investigated various factors that influence social presence using a virtual learning environment and empirically confirmed that the quality of instruction is significantly related to the level of social presence. More recently, Wei et al. (2019) investigated how VR technology improves theme park visitors' experiences and behaviors based on the presence perspective.

Their results reveal that functional quality (i.e., effectiveness and vividness) and experiential quality (i.e., temporal dissociation, heightened enjoyment, control, curiosity, and participation) were significantly associated with the sense of presence, subsequently affecting overall satisfaction and behavioral intentions (Wei et al., 2019). Additionally, Gunawardena and Zittle (1997) empirically confirmed that social presence is a crucial antecedent of satisfaction in virtual environments. Therefore, the current study proposes the following hypotheses.

    H4. VEQual will have a significant positive influence on social presence.

    H5. Social presence will have a significant positive influence on virtual event satisfaction.

    H6. Social presence will have a significant positive influence on revisit intention.

<div align="center">

Conceptual Framework

</div>

As shown in Figure 8, a conceptual research model is developed based on social presence theory and the IS success model and tested to examine the new VEQual scale within a nomological net of a critical VEQual conceptual relationship. This study offers the aforementioned six general hypotheses.
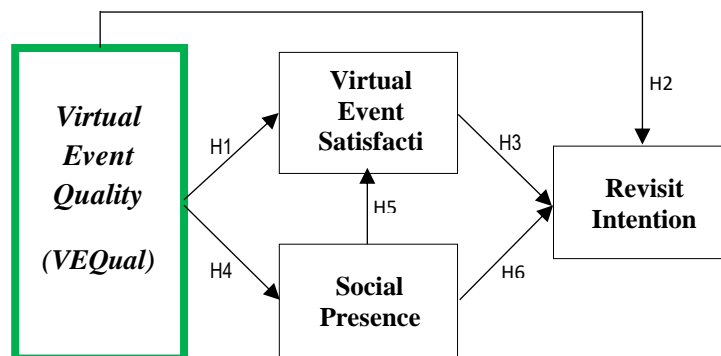
Figure 8. Nomological Net of Selected VEQual Conceptual Relationship

CHAPTER 3.

METHODOLOGY

Psychometrics, which refers to psychological measurement, is an instrument used to measure social and psychological phenomena (DeVellis, 2016). Despite the emergence of many innovative methods for data collection, such as big data analysis, survey research using psychometrics is still one of the most effective methods to "capture cross-sectional snapshots of current states of practice" and "describe and explain contemporary phenomena in practice (e.g. opinions, beliefs, or experiences)" (Wagner et al., 2020, p.29). Therefore, developing an appropriate measurement scale is a fundamental activity across various disciplines related to science, such as behavioral and social sciences, especially in the initial stages of studying a phenomenon (DeVellis, 2016; Wagner et al., 2020). Over the last several decades, many scales have been developed and used to evaluate people's perceptions or attitudes in order to investigate their important hypothesized relationships with other focal constructs or behaviors (Hinkin, 1995).

From Loevinger (1957) to DeVellis (2016), there have been a number of studies focusing on the development of adequate measurements. However, currently, there is no consensus regarding whose method is more scientific or rigorous. For example, Churchill (1979) suggested eight steps to develop better measures: (1) specify domain of construct, (2) generate sample of items, (3) collect data, (4) purify measure, (5) collect data, (6) assess reliability, (7) assess validity, and (8) develop norms. Moreover, recently, DeVellis (2016) provided specific guidelines regarding the development of measurement scales: (1) determine clearly what it is you want to measure, (2) generate an item tool, (3) determine the format for measurement, (4) have initial item tool reviewed by experts, (5) consider inclusion of validation items, (6) administer items to a development sample, (7) evaluate the items, and (8) optimize scale length.

Several researchers who have worked on determining better ways to develop a sound measurement scale (e.g., Churchill, 1979; DeVellis, 2016; Loevinger, 1957; Schmitt & Klimoski, 1991; Worthington & Whittaker, 2006) agree that it is a complicated, challenging, and systematic procedure that requires considerable theoretical and methodological efforts. According to the abovementioned studies, while labeling can be different depending on each study, in general, a scale-development procedure can be implemented through five basic steps: (1) item generation, (2) item screening, (3) scale purification, (4) scale validation, and (5) nomological validation.

Scale-development studies have been rapidly evolving with new approaches. There are diverse strategies utilized in scale development. Friedenberg (1995) proposed three categorized strategies: logical content or rational, theoretical, and empirical. The logical or rational approach fundamentally depends on a researcher's judgments, whereas the theoretical approach utilizes a particular theory to produce the items' content. However, both approaches are no longer employed in scale development; instead, empirical approaches that employ various statistical analyses (e.g., factor analysis) are regarded as a more rigorous method for scale development (Worthington & Whittaker, 2006). Therefore, this study employs an empirical approach to build homogeneous item groups by primarily relying on Churchill's paradigm (1997) and uses other salient literature (e.g., DeVellis, 2016; Worthington & Whittaker, 2006) to develop a robust and more useful instrument.

Overall Research Procedures

As Figure 9 indicates, this study complies with the established multistep scale-development process. This study is divided into five studies, which include multiple qualitative and quantitative data collections. In Study 1, multiple items and dimensions of the VEQual scale

were explored and generated through critical literature review and in-depth interviews with 20 virtual event attendees and providers. In Study 2, the generated pool of items was systematically reviewed and screened by nine subject-matter experts consisting of event faculties, PhD students, and event coordinators. In Study 3, the items retained from Study 2 were analyzed and refined using data collected from 482 virtual event attendees. Study 4 validated and confirmed the retained items and dimensions from the previous stage by employing confirmatory factor analysis (CFA) using newly collected data from 500 virtual event attendees. In Study 5, the developed VEQual scale's usefulness was examined, which is called nomological validation. A research framework was proposed based on grounded theories, social presence theory, and the IS success model and tested using a new sample of 699 virtual event attendees. A structural equation modeling (SEM) approach was adopted and used to empirically analyze the proposed model.
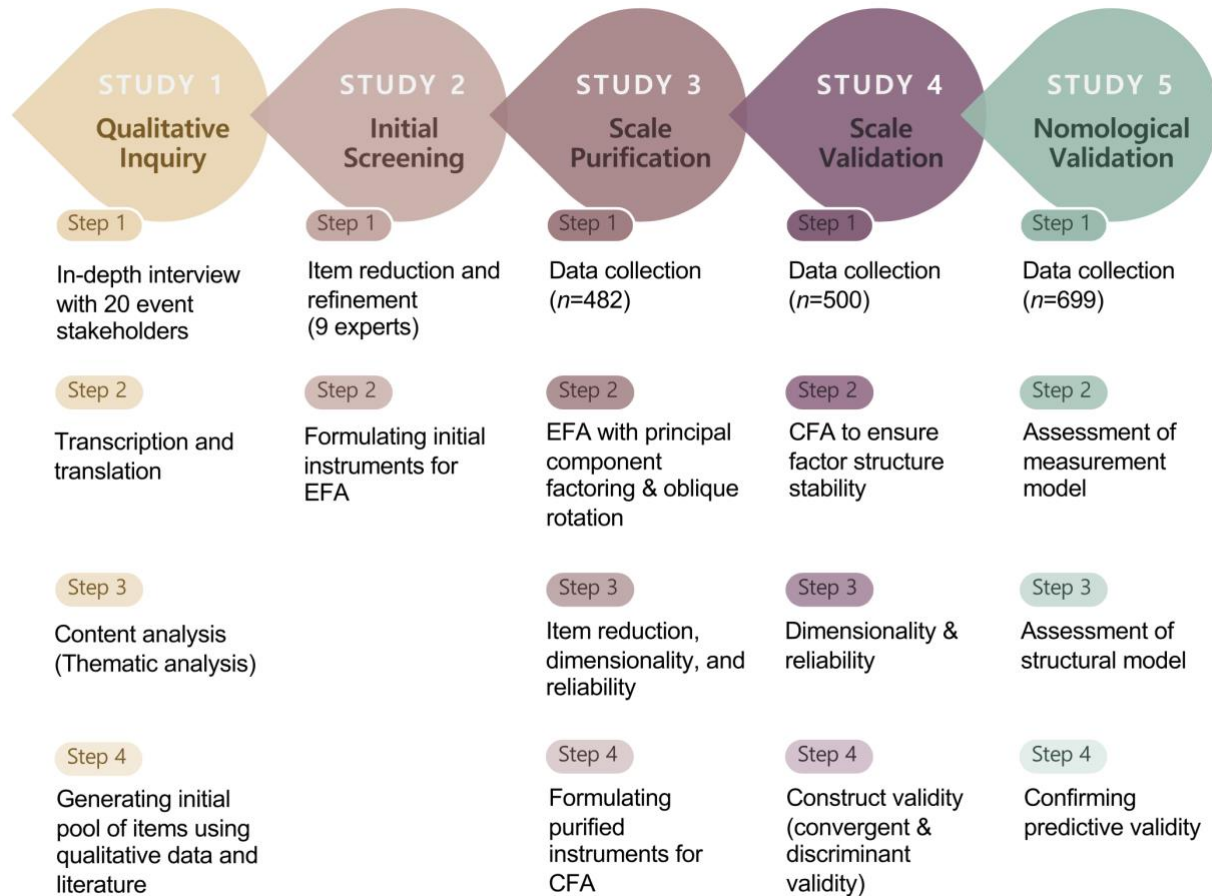
Figure 9. Procedures of Scale Development and Validation

Study 1. Qualitative Inquiry: Interviews

The first step in the process is to generate a pool of items that comprise the domain of VEQual. To achieve this objective, the domain of the construct should be specified first (Churchill, 1979). In addition, the scale developer must be very clear about what to measure and what is included in the measure. This was accomplished through a literature review, followed by an overview and insights from literature and in-depth interviews.

Sampling

Qualitative data collection was conducted through in-depth online interviews considering the current global pandemic situation. Although online interviews are not commonly used in comparison to face-to-face interviews, when conducted using virtual meeting platforms, such as Zoom or WebEx, they enable the transcendence of boundaries of time and space, reaching beyond the constraints of face-to-face contact (Edwards & Holland, 2013, p.26). The type of sampling used was purposive and convenience sampling, which is a non-probability sampling technique wherein subjects are selected based on their convenient accessibility and proximity to researchers.

In terms of sample size for the interview, qualitative researchers assert that there is no saturation point about the question of "how many" (Vasileiou et al., 2018) since the depth of qualitative data is considered significantly more important than the numbers (Burmeister & Aitken, 2012). Generally, in scale-development studies on e-service quality, the saturation point would be reached between 10 and 20 interviews (e.g., Ho & Lee, 2007; Lu et al., 2009; Sin et al., 2005; Yi & Gong, 2013). As such, this study conducted 20 in-depth interviews with event stakeholders to develop a set of items explaining VEQual more appropriately.

According to an event stakeholder typology study conducted by Todd et al. (2017), event stakeholders can be classified into five different categories by their different roles: organizing, participating, attending, supplying, and supporting, which are illustrated in Table 3. In the context of service, the two main parties related to the evaluation of service quality are service providers and consumers. In this study, therefore, interviews were conducted with two virtual event stakeholders: virtual event providers (i.e., organizers, participants, suppliers, and supporters) and consumers (i.e., attendees). More specifically, as Lu et al. (2009) also point out, there are two reasons why virtual event providers and consumers are selected to understand the

specific components of VEQual. According to the service quality GAPS model suggested by Parasuraman et al. (1985), one of the significant gaps is the inconsistency between consumers' expectations and the management's perception of consumers' expectations. Likewise, extant studies focusing on service quality indicate that service providers may not always know and understand the ever-changing consumer expectations (Lu et al., 2009). The other reason is that most previous studies that have used qualitative approaches to deal with service quality or e-service quality have conducted interviews not only with service providers but also with consumers in order to provide more appropriate and robust findings (e.g., Caro & García, 2007; Lu et al., 2009; Parasuraman et al., 1985). As such, this study employed an equal number of virtual event coordinators/planners (i.e., service providers) and attendees (i.e., service consumers) to pursue a balanced view of VEQual.

Table 3

Primary Event Stakeholder Categories

Primary stakeholder categories	Stakeholder roles within primary category
Organizing	Festival Society Board members, staff & volunteers
Participating	Performing companies, independent venues (staff, programmers, bookers)
Attending	Audience, ticket-buying public, other attendees
Supplying	Ticketing suppliers, design agency
Supporting	Government & civic organizations, grant funders, independent sponsors

Regarding virtual event providers, this study selected five event coordinators who work in event planning and operating firms and five who work for other organizations, such as destination marketing organizations (DMOs), public organizations, and event consulting firms,

as an event manager or coordinator. The 10 virtual event providers satisfied the sampling

criteria: (1) to be 18 years or older and (2) to have experience in planning and coordinating

virtualized events, such as festivals, sports, or business events, over the last six months. In

addition, 10 virtual event consumers (attendees) were recruited who satisfied the following

criteria: (1) to be 18 years or older and (2) to have experience participating in virtualized events,

such as festivals, cultural events, entertainment, sports, or business events, over the last six

months. The recruitment of interviewees followed two processes. (1) Recruitment of event

providers was conducted through a direct approach and discussion with potential participants.

The author directly contacted potential respondents over the phone or a conference call using

Zoom and WebEx. (2) Recruitment of event attendees was completed through a recruitment

email sent to prospective participants. An email was sent to a couple of event agencies, asking

them to send the recruitment email to their event attendees. In addition, the author directly

contacted potential participants who met the abovementioned sampling criteria.

Data collection

Considering each participant's personal schedule, an invitation to the virtual interview

was created and sent using WebEx, a virtual meeting application. To prevent information loss

during the interview, all the interviews were recorded under the interview agreement with the

participants using the recording function in WebEx. Each in-depth interview was conducted for

approximately 50–60 minutes in English or Korean and transcribed into textual data after

completion. The interview conducted in Korean was translated separately by professional

translators, and the quality of the translation was double-checked and confirmed by a researcher

involved with this study. To proceed with the interview more effectively and efficiently, a semi-

structured questionnaire (see Appendix) was prepared based on the literature; later, the questions

were refined and modified through three pilot interviews and an in-depth review from an academic expert. All interviews were conducted from January to February 2021.

The interviews were divided into four stages: introduction, warm-up question, in-depth question, and closing question. In the introduction part, it was confirmed through screening questions whether the participants were eligible to participate in the interview. In addition, the interviewer asked the participants introductory questions, such as respondents' demographics (e.g., age, gender, education, and occupation), and explained the entire interview process. In the warm-up section, the information of respondents' recalled experiences (e.g., name, date, programs, atmosphere, etc.) was collected. For event consumers and event providers, a couple of questions related to the important attributes of VEQual were asked. In the in-depth question section, the interviewer attempted to induce unlimited and bountiful answers related to VEQual from the customers' perspective by asking several open-ended questions. In the closing question section, an opportunity was presented to the participants to add some supplemental opinions about perceived VEQual, and the interviewer finalized the interview by asking additional necessary questions and summarizing the entire interview. To ensure the validity and reliability of the interview content, each transcription was sent to each interviewee and approved (Zahra & McIntosh, 2007).

Study 2. Initial Screening: Panel Expert Reviews

In the second step, the generated initial items were reviewed by nine subject-matter experts comprising event attendees, event planners, and academic experts in order to assess the item quality for several dimensions (DeVellis, 2016). Study 2 was designed to improve the face validity and content validity of the measurement scale (Churchill, 1979; DeVellis, 2016). More specifically, as explained by DeVellis (2016), the purpose of panel expert review was threefold:

(1) to confirm and invalidate the definition of each dimension of VEQual, (2) to assess each item's clarity and conciseness, and (3) to find out additional items that should be included but were not included. The invited respondents were asked to review and assess "the extent to which a set of items reflects the content domain" (Worthington & Whittaker, 2006, p. 814). In addition, they were asked to provide any feedback on the conciseness, reading level, redundancy, grammar, and wording of each item (Worthington & Whittaker, 2006). The results of Study 2 were presented in the next step.

Study 3. Scale Purification: Quantitative Study (1)

In the third step, the instrument item created was refined by using self-administered online surveys. To achieve the objective, factor analysis, which is a method utilized to identify or confirm several factors or constructs from many observed items (variables), was conducted.

Exploratory factor analysis (EFA) examines the construct validity at the beginning of scale development. To investigate the underlying dimensionality of the initial items, EFA was applied to a scale-development study. It also helps a researcher identify items that are not adequate for measuring an intended factor or to measure multiple factors simultaneously (Worthington & Whittaker, 2006). Consequently, EFA enables this study to determine if a specific item is a poor indicator of the desired construct and should be eliminated from the further phases. As recommended by Worthington and Whittaker (2006, p.808), three critical points should be described with the results of EFA: "(a) How many factors are present in an instrument, (b) Which items are related to each factor, and (c) Whether the factors are correlated or uncorrelated."

Sample and Data Collection

An online self-administered survey was conducted using a convenient sampling method. Generally, the required sample size likely depends on the number of factors. As stated by Worthington and Whittaker (2006, p.817), "there is some agreement that larger sample sizes are likely to result in more stable correlations among variables and will result in greater replicability of EFA outcomes." Floyd and Widaman (1995) asserted that to conduct a factor analysis, the minimum subject-to-item ratio should be 4:1 or 5:1. In most cases, as a rule of thumb, at least 300 cases or more should be used for factor analysis (Tabachinick et al., 2006; Worthington & Whittaker, 2006). However, several scale-development studies have a limitation regarding the appropriate sample size in the e-service context (Aladwani & Palvia, 2002; Cai & Jun, 2003; Ibrahim et al., 2006). Furthermore, as stated by Ladhari (2010), the samples used in most previous studies focusing on scale development consist of a student population, consequently limiting the scale's generalizability and reducing its applicability to the broader population. Therefore, this study distributed a survey questionnaire to 560 American adults who had attended any type of virtual event over the last six months. More specifically, to avoid bias and reach a more widely applicable conclusion, the quota sampling method was adopted. Employing the typology of planned events outlined by Getz and Page (2016), survey responses were collected from respondents who attended *festivals and cultural events*, such as festivals, commemorations, carnivals, parades, religious rites, etc. (25%, ± 5%); *entertainment*, such as concerts, shows, award ceremonies, etc. (25%, ± 5%); *sports events*, such as virtual marathons, races, trekking, hiking, etc. (25%, ± 5%); and *business events*, such as meetings, conventions, fairs, exhibitions, incentives, etc. (25%, ± 5%).

A pilot test was initially conducted with 30 American adults who satisfied the above sampling criteria using the Qualtrics online survey service to identify items or questions that did

not make sense to respondents or any problems with the questionnaire that might cause biased responses. Through the pilot test, the response quality was also checked, and, as a result, the following question was added to the questionnaire for obtaining better-quality responses: "Do you commit to providing your thoughtful and honest answers to the questions in this survey?" Respondents were also asked to answer two verification (i.e., screening) questions: (1) Have you attended a virtual event, such as a festival, culture event, conference, exhibition, sports event, tradeshow, etc., held on a virtual platform (e.g., website or mobile application) over the last 6 months? (2) If yes, please provide the exact name of the virtual event in which you recently participated. Those who successfully passed this verification were allowed to answer the rest of the online survey.

In February 2021, a self-administered online survey was distributed to American adults who satisfied the above sampling criteria. Respondents were recruited from Qualtrics, an online survey firm. To ensure the quality of responses, each respondent was required to describe the exact name of the virtual event that they attended. In turn, the existence of the virtual events mentioned by the respondents was confirmed, and non-existing virtual events or irrelevant answers to the question were removed. Furthermore, responses that were not thoughtful, including unengaging answers (i.e., straight responses) or answers completed in a short time (i.e., half of the median survey-completion time), were removed. In total, 482 usable questionnaires were collected and used for data analysis. The collected data were analyzed using IBM SPSS 26.0.

Questionnaire and Response Format

The main body of the questionnaire consisted of three parts. The first part collected information about respondents' recalled experiences, including the name of the virtual event and their motivation to attend the event. The second part of the questionnaire was about respondents'

subjective perception about the virtual event in which they had recently participated. They were asked to evaluate the items of VEQual developed in the previous phases (i.e., qualitative inquiry and initial screening). The final part of the questionnaire collected survey respondents' socio-demographic characteristics, such as gender, age, ethnic background, marital status, and income.

Regarding the type of response format, Likert scaling is commonly utilized in instruments measuring perceptions, opinions, beliefs, or attitudes (DeVellis, 2016). When a study uses a Likert scale, each item is required to be presented as a declarative sentence, and a respondent is asked to indicate varying degrees of agreement with regard to the item. This study adopted a seven-point Likert scale ranging from "strongly disagree" to "strongly agree."

Study 4. Scale Validation: Quantitative Study (2)

In Study 4, CFA was used to support the validity of measurement (Churchill, 1979; DeVellis, 2016; Worthington & Whittaker, 2006). CFA is a powerful confirmatory technique used to examine whether items of a construct are consistent with researchers' understanding of that construct. Therefore, CFA enables this study to verify that all developed items are appropriately aligned with the correct facets within the construct being measured. As Churchill (1979, p.70) outlined, CFA was performed using a new sample to obtain "a reliability coefficient which assesses the between-test error" and "to rule out the possibility that the previous findings are due to chance." Applying the preliminary scale to a new sample, CFA was conducted to further determine and validate the scale's dimensionality using SEM. Construct validity for the newly developed measurement scale was examined using convergent validity and discriminant validity analysis.

Sampling and data collection procedures were similar to those used in the first quantitative data collection. The appropriate sample size for a particular SEM model depends on several factors, including the model complexity and the commonalities in each factor (Hair et al., 2009). Depending on a number of constructs with multiple items, the adequate sample size is different (Hair et al., 2009). In general, a large sample size is necessary for conducting CFA with SEM to provide stable parameter estimates. According to previous studies (Bentler & Chou, 1987; Worthington & Whittaker, 2006), the 5:1 ratio of respondents to the number of parameters would be the minimum, and a ratio of 10:1 would be optimal. To estimate a more adequate sample size, this study utilized a sample size calculator program by using a 5% margin of error and a 95% confidence level, which are commonly used in social science studies. As a result, 220 was the appropriate sample size for conducting CFA.

Therefore, in March 2021, another self-administered online survey was distributed to the convenient sample of 550 American adults who had attended any type of virtual event (i.e., festivals and cultural events, entertainment, sports events, or business events) over the last six months, indicating a sufficient sample size for this study. To ensure that the newly developed scale can be applicable regardless of event contexts, the quota sampling method (+/− 25% for each event type) was adopted. Respondents' recruitments were conducted via Qualtrics. A pilot test was also conducted for 30 American adults who satisfied the sampling criteria.

The questionnaire composition and response format were consistent with those used in the first data collection. The main body of the questionnaire consisted of three parts (i.e., information about respondents' recalled experience, subjective perception about newly developed VEQual, and demographic characteristics). To ensure the quality of responses, screening questions used in the first data collection were added to the beginning of the

questionnaire. A seven-point Likert scale ranging from "strongly disagree" to "strongly agree" was also adopted. To analyze the collected data, IBM SPSS 26.0 and Mplus 7.4 were used. Additional assessment of the scale, such as correlations among the dimensions, was conducted to provide further evidence of the viability of the scale (Karatepe et al., 2005). Similar to Study 4, data cleaning was performed by removing data that were incorrect, irrelevant, or improperly formatted. As a result, in total, 500 usable questionnaires were collected and used for data analysis.

Study 5. Nomological Validation: Quantitative Study (3)

In the final and most crucial step of the process, this study conducted a nomological validity test to learn more about the newly developed scales (Cronbach & Meehl, 1955). In Study 5, focal relationships between VEQual, social presence, virtual event satisfaction, and behavioral intentions were verified using the proposed conceptual framework (see Figure 8). Again, to test the stability of the scale and the external validity, a self-administered online survey was distributed to 760 American adults who participated in any type of virtual event, including festivals, sports, and business events, over the last six months. The survey respondents were recruited from Qualtrics, and several qualification questions were given to ensure the high quality of data. To ensure the quality of response, the collected data were screened by adopting the same procedure used in prior data collections. A total of 61 responses (31 outliers identified using the Mahalanobis D test and 30 irrelevant responses to the screening question) were found and eliminated from the original dataset. A partial nomological network will be presented to address nomological validity issues (Churchill, 1979; Kock et al., 2019). The current study adopts a seven-point Likert-type scale ranging from 1 equaling "strongly disagree" to 7 equaling "strongly agree". Except VEQual, each measurement item was employed from well-developed

prior studies with some minor changes in wording, as illustrated in Table 4. IBM SPSS 26.0 was

used to identify the respondents' demographic characteristics, and the Mplus7.4 software was

employed for SEM analysis.

Table 4

Measurement Items

Construct	Item	Reference
Social presence	SP1. There is a sense of human contact in the virtual event.	Cyr et al. (2007); Gefen & Straub, (2003)
	SP2. There is a sense of sociability in the virtual event.	
	SP3. There is a sense of human warmth in the virtual event.	
	SP4. There is a sense of human sensitivity in the virtual event.	
Virtual event satisfaction	SAT1. I am satisfied with my decision to participate in the virtual event.	Carlson & O'Cass (2010); Song & Hollenbeck (2015)
	SAT2. The virtual event did a good job of satisfying my needs	
	SAT3. I am satisfied with the experience in the virtual event.	
Revisit intention	RVI1. I intend to revisit the virtual event in the future	Huang & Hsu (2009)
	RVI2. I plan to revisit the virtual event in the future	
	RVI3. I desire to visit the virtual event in the future	
	RVI4. I probably will revisit the virtual event in the future	

CHAPTER 4.

RESULTS

The current study's primary purpose is to develop an instrument to measure virtual event attendees' perception of virtual events and validate the newly developed measurement through a meaningful conceptual model. In this chapter, the results of the qualitative and quantitative phases (i.e., qualitative inquiry, initial screening, item purification, and item validation) are presented. The detailed results are illustrated in the order of studies conducted.

Study 1. Qualitative Inquiry

Interviewees' Profiles

As explained in Chapter 3, the 20 interviewees consisted of 10 individuals who had attended a virtual event and 10 individuals who had planned or coordinated a virtual event over the last three months. Half of the interviewees were male, and the other half were female. Their ages ranged from 29 to 50 years. All the participants had a high education level (a bachelor's degree or higher). Eight of the 10 event attendees were employed full-time, and two were students. Among the 10 event providers, there were three event planners and coordinators, followed by a destination marketer, a brand consultant, and a government official. The majority of interviewees (45%) had experienced a business event, followed by festivals/cultural events (35%), sports events (15%), and entertainment (5%). Additional demographic characteristics of the sample are summarized in Table 5.

Table 5

Profiles of Interviewees

ID	EA/EP[1]	Age	gender	Education	Marital status	Occupation	Attended/provided virtual event
R1	EA	38	male	bachelor	married	Employed full time	music concert
R2	EP	35	female	bachelor	married	Employed full time	sport event
R3	EP	40	female	bachelor	single	Employed full time	festival
R4	EA	38	male	graduate	single	Student	sport event
R5	EP	45	female	bachelor	married	Employed full time	cultural event
R6	EP	41	male	graduate	married	Employed full time	meeting
R7	EP	40	male	bachelor	married	Employed full time	cultural event
R8	EA	30	male	bachelor	single	Employed full time	business
R9	EA	40	female	graduate	married	Employed full time	conference
R10	EA	50	female	graduate	married	Employed full time	baby fair
R11	EP	43	female	graduate	married	Employed full time	cultural event
R12	EA	29	male	bachelor	single	Employed full time	sport event
R13	EA	32	female	bachelor	married	Employed full time	conference
R14	EA	37	female	bachelor	single	Employed full time	cultural event
R15	EP	45	male	bachelor	single	Employed full time	cultural event
R16	EA	30	female	bachelor	single	Employed full time	business
R17	EP	45	female	graduate	married	Employed full time	meeting
R18	EA	50	male	graduate	married	Employed full time	festival
R19	EP	42	male	bachelor	married	Employed full time	exhibition
R20	EP	39	male	bachelor	single	Employed full time	business

Note. 1) EA= virtual event attendee, EP= virtual event provider

Qualitative Data Analysis

To analyze the collected qualitative data, this study conducted a content analysis by following a procedure commonly used in scale-development studies (e.g., Brady & Cronin, 2001; Lu et al., 2009). All the transcribed interview results were placed on ATLAS TI, a qualitative analysis software. This software enabled the researcher to input categories and have each sentence coded more quickly and efficiently compared with hand-coding. To identify the

initial items and dimensions of VEQual, a researcher involved with this study repeatedly looked at the notes, transcripts, and coded sentences depending on their frequency of occurrences. For example, a statement, "the route to the registration page should be easy to find and simple for access (R17)" was coded as "easy to find." By repeatedly reading each sentence, this study developed an interactive set of categories and added categories through the coding process. In turn, similarly coded sentences (e.g., easy to understand, easy to find, easy to use, and easy to download) were classified into the same dimension (e.g., easy to use). As shown in Table 6, even if the relevant comments in each dimension were repeated more than once, each participant's statement was checked only once. To ensure the data's consistency and to reduce the researcher's biases, such as prejudice, the researcher abandoned any presumption about the interviewees during the entire data analysis (Fisher, 2009). In terms of the interview content's validity and reliability, the coded transcript and identified dimensions were sent to all participants again to have further confirmation (Zahra & McIntosh, 2007) and were successfully confirmed.

Results

In total, 10 categories of alternative words for VEQual emerged from the exploratory in-depth interviews and fitted well into the nine dimensions proposed in the literature review phase except for "price." Similar to previous studies (Brady & Cronin, 2001; Lu et al., 2009; Zeithaml et al., 2000), this study wiped out price (e.g., return on investment) from the list of dimensions, as it was determined to be a determinant of a virtual event's value rather than VEQual. As a result, nine dimensions, namely, "Vividness," "Design," "Functionality," "Ease of Use," "Information," "Responsiveness," "Entertainment," "Fulfillment," and "Privacy/Security" were retained for the next phase. Following the recommendations by DeVellis (2016), it was checked whether the generated pool of items has multiple negatives, double-barreled items, ambiguous

70

pronoun references, or misplaced modifiers. The summary of relevant interviews for each

dimension and the generated initial pool of items by incorporating both results of the literature

review and interviews are illustrated as follows.

Table 6

Appearances of Dimension Per Each Respondent

Dimensions	Respondent																				Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
Vividness	1		1					1						1			1			1	6
Design	1			1	1			1	1		1		1					1			8
Functionality	1	1	1	1		1		1	1	1	1	1	1	1		1	1	1	1	1	17
Ease of Use	1	1		1	1	1	1	1	1	1	1	1		1	1	1	1		1	1	17
Information	1	1		1	1	1	1	1	1		1	1	1		1				1		13
Responsiveness	1	1				1	1	1	1	1		1	1	1	1	1	1		1	1	15
Entertainment	1	1			1	1	1	1		1			1			1	1		1		11
Fulfillment	1	1	1	1		1		1	1		1	1		1	1	1	1	1	1	1	16
Privacy/security		1			1			1	1	1			1							1	7

Vividness

The results of the interviews show that virtual event attendees could feel a "sense of

being" in a realistic event venue when the level of the vividness of video and image was high. A

virtual sports event attendee said, "In my mind, the quality and clarity of the video and images

are more important. When the race is introduced as if I were in the stadium, I would feel that I

was in the stadium for a while" (R8). Given that virtual events are provided through a virtual

platform (e.g., website or mobile application), the quality of all the provided imagery (e.g.,

image, video, or text) was assessed as an important factor; thus, it was argued that imagery

should be optimized for online viewing. In this regard, two interviewees mentioned that "In

offline (in-person) events, you just watch with your own eyes…. in a virtual event, the images

are viewed online, so virtual events should be optimized to be viewed online" (R17) and

"Graphics and sound matter (in a virtual event). High-resolution pixel graphics and real-looking

graphics and sound are important" (R3). Based on this discussion and literature review, seven

initial items of vividness were developed, as discussed below.

Table 7

Initial Scale Items for the "Vividness" Dimension

Items	Sources
The imagery used in the virtual event is clear	Lee et al., (2020)
The imagery used in the virtual event is accurate	
The imagery used in the virtual event is vivid	
The imagery used in the virtual event is well defined	
The virtual event is optimized for online viewing	Interview
The virtual event provides high resolution pixel graphics	
The virtual event provides clear video and images	

Design

Interview participants commonly pointed out the importance of the simple design of

virtual event platforms rather than the aspects related to aesthetics. This indicates that the quality

of design in a virtual event should be evaluated based on how well the design helps an event

attendee participate in the event, and not on the aesthetical elements. For example, two virtual

event attendees said, "We want a simple design and an easy description where people can click

by just looking at an icon and know what they are" (R9) and "If I were an evaluator, I would

look at the design. The design (of a virtual event) should be stylish and simple" (R10). Further,

an event coordinator pointed out, "With too many complex visual designs, I think it will be

confusing. That's my personal thought, but design should be simple" (R18). In this regard,

interviewees stated that legibility is a critical component determining the quality of a virtual event platform's design. A virtual event coordinator mentioned, "legibility of the images and letters are important…People don't really read. People read less than we think. And on the web, people read even less! They just look at the images. For users, it can be hard to read. Then we need to think whether these are legible" (R11). Based on the current literature and interview results, 13 initial items were generated under the "design" category.

Table 8

Initial Scale Items for the "Design" Dimension

Items	Sources
Text and image are always displayed legibly	Fassnacht & Koese
Symbols/icons are readily identifiable.	(2006)
Pictures/images are always displayed properly	
The virtual event's platform looked attractive	Aldwani & Palvia
The platform used for the virtual event looks organized	(2002)
The platform used for the virtual event uses fonts properly	
The platform used for the virtual event uses colors properly	
The platform used for the virtual event uses multimedia features properly	
The platform design of the virtual event is aesthetically attractive	Cai & Jun (2003)
The overall design of the virtual event is user-friendly	Interview
Text and image in the virtual event are always displayed intuitively	
The platform used for the virtual event is aesthetically simple	
All the descriptions (e.g. registration, participation) are easy to read	

Functionality

In the virtual event setting, almost all interview participants (85%) agreed that functionality is a core factor in measuring VEQual since it is a fundamental component to support the entire process of virtual events and to hold an event in a virtual environment. An

attendee of a virtual business event said, "When I visit a website (of the virtual event), design matters, but I care more about functional aspects….I prefer functional aspects over visual aspects" (R10). Another attendee stated, "I think, basically, how well the system is established matters. I'm saying, you come and go, and talk, and that conversation needs to be heard in real time. But it should not buffer. I think buffering can be the biggest problem" (R13). In fact, a low level of sound quality, buffering, and disconnection are examples of functionalities that lead to event attendees' negative perception about the entire experience of the virtual event. For example, an event provider said, "Now sound quality is the biggest problem. In a virtual event, (therefore) we had on-site staff and systems capturing the sound" (R3). Another event attendee stated, "Because it's an online (virtual) event, people have experienced buffers… they experienced difficulty with the program being disconnected and connected again" (R9). Thus, 12 initial items of the dimension "functionality" were generated based on previous literature and interview findings.

Table 9

Initial Scale Items for the "Functionality" Dimension

Items	Sources
The virtual event is easy to navigate through	Aldwani & Palvia (2002)
It is quick and easy to complete registration	Ho & Lee (2007)
All the links work quickly	
The virtual event has well-arranged categories	Tsang et al. (2010)
There was no trouble downloading necessary materials (i.e., applications, files)	Interview
Sound is clear and does not cut out	
All of the functions of the virtual platform work well	
The virtual event does not become slower or buffer/stutter	
There are no interruptions during speaking and listening	
The virtual event provides a stable connection	
No errors occurred on the platform at any point	
All the videos stream in a stable way	

Ease of Use

The majority of interview participants repeatedly pointed out that ease of use is one of the most important attributes when attending a virtual event. An event provider said, "All they (consumers) care is how easy it is to use and access. But if these virtual events or platforms are well-designed, in other words, with an easier user experience and user interface, it's easier for users. When we are talking about web access or Zoom, we have tried all, but Zoom is most commonly used in Korea. When I asked around, people say they use zoom because it's easier to use" (R6). In addition, event attendees consistently asserted that this dimension should be considered a primary quality since people of different age groups participate in the event. An attendee of the virtual sports event said, "I think it's important to make the functions and things easy to find. Because, looking back, virtual events are attended by people from different

generations. Therefore, the website or platform should be easy to use and straightforward" (R4). Another event planner agreed with this argument by stating, "When we are thinking of the level of expertise that people have here, we should aim for the lowest level as much as possible to make it easier to understand. As if we are giving a lesson to someone who has no idea. Instead of having a higher barrier, we should make it as easy as possible for anyone to have access" (R19). Based on the current literature review and interview results, 10 initial items were generated under the "ease of use" dimension.

Table 10

Initial Scale Items for the "Ease of Use" Dimension

Items	Sources
The organization and structure of the virtual event are logical and easy to follow	Jun et al. (2004)
The virtual event directs the customer step by step.	Fassnacht & Koese
It does not take much time to learn how to use the virtual event's platform	(2006)
Using the virtual event's platform is not complicated	Sohn & Tadisina
Using the virtual event's platform does not requires a lot of effort	(2008)
It is easy to complete a transaction through the virtual platform	
The virtual event's platform is convenient to use	Interview
It is easy to download the necessary materials	
It is easy to access the platform to participate	
Only a few clicks take me where I want	

Information

Most of the interview participants presented identical thoughts about this dimension. An event coordinator said, "I think information is a must for virtual events. If you don't know how to use the app or how it works, and it's hard to join the event or to have an idea what the event is about. So, we need enough information before the event for a smooth experience" (R2). Another

event coordinator, who organized a virtual cultural event, said, "I think it is far more important to make the useful information available and to provide this information for easier access" (R5). Furthermore, two different attendees of virtual business events said, "I think it's important for people to be fully knowledgeable about the technology that enables them to participate in the online meeting" (R9) and "When the event is taking place in a virtual space, more information should be included in the website" (R13). Building upon the results of the literature review and interviews, 11 initial items of the dimension "information" were generated.

Table 11

Initial Scale Items for the "Information" Dimension

Items	Sources
The virtual event provides trustworthy information	Janda et al (2002)
Information contained on the virtual event's platform is current and timely.	Li et al. (2002)
On the virtual event platform, I have all of the required information at hand.	Tsang et al. (2010)
Pre-informational service enables me to have good knowledge of the event program and schedule.	Yoon et al. (2010)
The virtual event provides enough information (rich in detail)	Interview
Information provided by the virtual event is accurate	
Information provided by the virtual event is easy to understand	
Information provided by the virtual event is useful	
The virtual event provides all of the necessary information	
All Information is delivered in easy-to-understand manner	
The virtual event provides up-to-date information	

Responsiveness

The majority of interview participants repeatedly pointed out that responsiveness is a key component that should be considered in the evaluation of the overall VEQual. An attendee of a

virtual sport event said, "There's no one to guide you in a virtual event. In a virtual event like this, inquiries come online and guidance is given online. So, the channel for communication should be notified clearly, and the guidance should be given immediately on time" (R12). Another business event attendee supported this assertion by stating, "It's important how quickly people were guided when they had trouble accessing. From the service perspective, I am talking about the responses of the event provider" (R8). In particular, several interview participants maintained that it is considerably important to respond promptly to not only normal attendees' needs and problems but also interrupters' irrelevant words or behaviors in a live virtual event. An event coordinator, who organized a virtual sports event, stated, "It's important that we manage and control any vulgar or unacceptable behaviors or expression by the participants" (R2). An attendee of a virtual business event concluded, "It's important that they (event providers) deleted swear words or offensive language. I think it was necessary to filter unnecessary information because everyone is leaving comments on a shared page" (R16). Based on the findings of a qualitative inquiry, nine initial items were generated for the "responsiveness" dimension.

Table 12

Initial Scale Items for the "Responsiveness" Dimension

Items	Sources
If I want to, I could easily contact a customer service representative.	Cai & Jun (2003)
The virtual event responds to attendee inquiries promptly.	Ho & Lee (2007)
Help and support are available when problems are encountered.	Ho & Lee (2007)
The virtual event provider demonstrates its willingness to help me.	Interview
I would say that the quality of my interaction with the virtual event is high.	
Two-way communication is available in the virtual event.	
The virtual event provides real-time interaction service (e.g. chat).	
Overall, I'd say the quality of my interaction with the event provider was excellent.	
The interaction I have with the event provider is of a high standard.	

Entertainment

In the current study, almost all interview participants emphasized the importance of the entertainment feature of virtual events. An event provider said, "Above all, it must be fun, right? Usually all we do is leave comments as we watch live. But I think it must be fun" (R7). Also, another event attendee said, "I think we need to have fun and have a lot of factors that can ignite viewers' interest when we target general participants. It (the virtual event) should be planned as if it were a TV show or an Internet broadcast for fun" (R8). An event coordinator stated, "If the contents are boring or people have a hard time understanding the contents, they lose their interest" (R6). Undoubtedly, providing the same or higher level of entertainment features compared with traditional in-person events can be a key factor determining the success of a virtual event. Another virtual event attendee mentioned that "Personally, if I were listening to a lecture, I think listening to it online would be far more immersive and better. When I found something funny during the (virtual) meeting, I could focus on the event better" (R16). Derived

from the results of a literature review and interviews, nine initial items were generated for the "entertainment" dimension.

Table 13

Initial Scale Items for the "Entertainment" Dimension

Items	Sources
The contents provided by the virtual event are funny	Chen & wells
The contents provided by the virtual event are attractive	(1999)
The contents provided by the virtual event are interesting	
The contents provided by the virtual event are entertaining	
The contents provided by the virtual event are enjoyable	
The contents provided by the virtual event are not boring	Interview
When the event ended, I felt that I enjoyed it and it left a lasting impression	
When I leave an event, I usually feel that I have had a good experience	
I believe the event tried to give me a good experience	

Fulfillment

Almost all interview participants asserted that the level of fulfillment would be an important evaluation criterion for measuring VEQual. An event coordinator said, "We called this return on investment, (and) I think it's important to know that as the experience is worth the investment of time and money we put in. I think that's it" (R15). Another event provider similarly asserted, "Consequently, I think the most important question is whether it was worth it or not. Was it worth it? Time is an investment too, right? That is from the perspective of the viewer" (R3). An attendee of a virtual business event stated, "(In a virtual business event,) it's important if the desired information has been provided" (R13). Based upon findings from the qualitative phases, 14 initial items were generated for the "fulfillment" dimension.

Table 14

Initial Scale Items for the "Fulfillment" Dimension

Items	Sources
The virtual event served its purpose very well.	Fassnacht & Koese (2006)
Programs/services of the virtual event were delivered by the time promised.	Ho & Lee (2007)
The final price of the virtual event properly reflected the true value.	Ding et al., (2011)
Programs/services of the virtual event were delivered as promised.	
The operating time of the programs is appropriate.	Interview
The virtual event provided the desired outcome.	
The virtual event offers a unique experience.	
It was worthwhile to participate in the virtual event.	
It was valuable to attend the virtual event.	
The virtual event allowed me to achieve my participation goal.	
The virtual event offered rewards to me for my time and effort.	
The virtual event correctly provides the programs that I want.	
The virtual event accurately offers the programs that I need.	
The virtual event program properly reflects the purpose of the event	

Privacy/Security

The results of the interviews indicate that privacy/security is also an important component in evaluating a virtual event. An event attendee said, "When we are watching offline, we can just go there without giving too much information about ourselves. But if we participate here (in a virtual event), we have to give too much information in advance, and people may worry about it. My personal information is up online, so unless the website is closed, that information will be on the web continuously. I think these are the limitations" (R8). Another event attendee, a middle school teacher, stated, "I told you before that I'm a teacher who conducts online class. The thing that I worry about the most is a screenshot. If my images are

online, there are people who may want to use them in bad ways. I think fear for such actions is very high. So, I use some virtual image or display a very small image. Is the virtual event safe to use for me and my computer? I think it's an important question" (R9). Likewise, an event coordinator agreed with the importance of privacy and security in coordinating a virtual event and said, "I think it's important to make sure that personal information and privacy of the event participants are protected" (R2). Building upon the findings of the qualitative inquiry, eight initial items were generated for the dimension "privacy/security".

Table 15

Initial Scale Items for the "Privacy/Security" Dimension

Items	Sources
The virtual event assured me that I will not be placed on mass-mailing lists	Janda et al (2002)
The virtual event assured me that information about my online activities will not be shared with other parties	
The virtual event assured me that my personal information will not be shared with other marketing organizations	
I feel secure in providing personal information for event participation	Jun et al. (2004)
I feel the risk associated with event participation is low	
The virtual event protects information about my behavior related to event participation	Parasuraman et al. (2005)
The virtual event does not share my personal information with other parties	
The virtual event protects information about my activity during the event	

Study 2. Initial Screening

Results

Following the development of the initial set of 93 items, panel expert reviews were conducted to improve face validity and content validity. After reading each dimension's

82

definition and relevant explanation, nine subject matter experts were asked to rate how relevant they think each item was with regard to what each dimension intended to measure (DeVellis, 2016, p.135). In addition, they were asked to find any items that were redundant, ambiguous, and faulty. The nine experts consisted of four event faculties from different colleges (e.g., Purdue University and UNLV), four PhD students who had participated in a virtual event over the last six months, and a virtual event coordinator. This process enabled several items to be modified for content validity. For example, a faculty member pointed out that in the vividness dimension, it might be unclear what the "imagery" indicated from the perspective of respondents. Thus, specific examples such as videos and images were added to the items to enhance clarity. Also, considering redundancy, an item from the information dimension, "The virtual event provides all the necessary information," was merged with the another item "Information provided by the virtual event is useful."

The nine experts reviewed and rated how well each of the 93 items reflected the different dimensions using the following scale: 1 point = clearly representative, 2 points = somewhat representative, and 3 points = not at all representative (Yi & Gong, 2013). The current study retained only those items that evaluated as being as less than 12 points (Bearden et al., 2001; Yi & Gong, 2013; Zaichkowsky, 1985). As shown in Table 16, this process eliminated 45 items; consequently, 48 items were retained and utilized for the next phase.

Table 16

Preliminary Pool of VEQual Items

Dimensions	Items
Vividness (5)	1. The virtual event is optimized for online (e.g., website, mobile app) viewing
	2. The virtual event provides high resolution pixel graphics
	3. The virtual event provides clear video and images
	4. The imagery (e.g., video, images) used in the virtual event is accurate
	5. The imagery (e.g., video, images) used in the virtual event is vivid
Design (5)	1. All the descriptions (e.g. registration, participation) in the virtual event are easy to read
	2. Text and image used in the virtual event are always displayed legibly
	3. Symbols/icons used in the virtual event are readily identifiable.
	4. Pictures/images used in the virtual event are always displayed properly
	5. The platform (e.g., website, mobile application, etc.) design of the virtual event is aesthetically appealing
Functionality (5)	1. The necessary materials were easy to download (i.e., applications, files)
	2. Sound is clear and does not cut out during the virtual event
	3. No interruptions interfered with participants' speaking and listening.
	4. The virtual event provides a stable connection
	5. No errors occurred on the virtual event platform at any point
Ease of Use (6)	1. The organization and structure of the virtual event are easy to follow
	2. The virtual event directs the customer step by step.
	3. Only a few clicks take me where I want
	4. It does not take much time to learn how to navigate the virtual event's platform
	5. Using the virtual event's platform is not complicated
	6. Using the virtual event's platform does not requires much effort
Information (5)	1. Information provided by the virtual event is accurate
	2. Information provided by the virtual event is easy to understand
	3. Information provided by the virtual event is useful
	4. The virtual event provides up-to-date information
	5. Pre-informational service keeps me well-informed of the event program and schedule.
Responsiveness (6)	1. Two-way communication is available in the virtual event.
	2. The virtual event provides real-time interaction service (e.g. chat)
	3. If I want to, I could easily contact a customer service representative
	4. The virtual event responds to attendee inquiries promptly
	5. Help and support are available when problems are encountered
	6. The virtual event provider demonstrates its willingness to help me
Entertainment (5)	1. The contents provided by the virtual event are attractive
	2. The contents provided by the virtual event are interesting
	3. The contents provided by the virtual event are entertaining
	4. The contents provided by the virtual event are not boring
	5. When the event ended, I felt that I enjoyed it and it left a lasting impression
Fulfillment (6)	1. The virtual event served its purpose very well
	2. Programs/services of the virtual event were delivered by the time promised

	3. Programs/services of the virtual event were delivered as promised
	4. The virtual event provided the desired outcome
	5. The operating time of the virtual event programs is appropriate
	6. The virtual event program properly reflects the purpose of the event
Privacy/security (5)	1. The virtual event assured me that my personal information will not be shared with other parties
	2. I feel secure in providing personal information to participate in the event
	3. I feel the risk associated with event participation is low
	4. The virtual event protects information about my behavior related to event participation
	5. The virtual event protects information about my activity during the event

Study 3. Scale Purification (Quantitative Data Analysis 1)

Descriptive Statistics

A total of 482 usable responses were collected to conduct item purification. The majority of respondents were aged between 25 and 44 (51.9%), and 58.9% of the participants were female. More than half of the respondents (66.0%) reported having a bachelor's degree or graduate degree, showing that most respondents had a higher level of education. In addition, 57.1% of the respondents were employed full-time, and the annual household income of 63.3% of respondents was less than $100,000. The types of virtual events that respondents had attended were as follows: 27.2% attended entertainment events, 27% attended business events, 23.9% attended sports events, and 22.0% attended festivals and cultural events. Table 17 summarizes the demographic characteristics of the respondents.

Table 17

Demographic Characteristics of Respondents

Variable	Value	Frequency (*n*=482)	Percentage (%)
Gender	Male	198	41.1
	Female	284	58.9
Age	18-24	17	3.5
	25-34	73	15.1
	35-44	184	38.2
	45-54	66	13.7
	55-64	79	16.4
	65 or old	63	13.1
Education	High school or less	43	8.9
	Some college	67	13.9
	Associates' degree, trade/technical school	54	11.2
	Bachelor's degree	161	33.4
	Graduate degree	157	32.6
Job	Employed full time	275	57.1
	Employed part time	40	8.3
	Unemployed	59	12.2
	Retired	78	16.2
	Student	7	1.5
	Other	23	4.8
Household Income	Less than $50,000	119	24.7
	$50,000-$74,999	89	18.5
	$75,000-$99,999	97	20.1
	$100,000-$149,999	105	21.8
	$150,000 or more	72	14.9
Marital Status	Single	102	21.2
	Married	321	66.6
	Divorced/widowed/separated	52	10.8
	Other	7	1.5
Ethnicity	White	421	87.3
	Black or African American	24	5.0
	American Indian or Alaska Native	1	0.2
	Asian	21	4.4
	Hispanic /Latin American	9	1.9
	Other	6	1.2
Type of Event	Festival or culture Event	106	22.0
	Business event	130	27.0
	Entertainment event	131	27.2
	Sports events	115	23.9

Results

The current study used corrected item-to-total correlations for each set of items as the criterion to determine whether to delete or to retain (Churchill, 1979); a low item-to-total correlation indicates a generic random error (Viswanathan, 2005). Two items (functionality 2 and privacy/security 3) that had corrected item-to-total correlations below a cut-off value of 0.40 were deleted (Nunnally & Bernstein, 1994; Wolfinbarger & Gilly, 2003).

This study then evaluated the remaining items by employing EFA. Along with the oblique rotation method, principal component analysis was used as the extraction method to extract the VEQual factors (Ding et al., 2011; Lu et al., 2009; Parasuraman et al., 2005). In terms of the rotation method, there are two-factor rotations: orthogonal and oblique rotation. While orthogonal rotation is usually used for factors that are statistically independent of each other (i.e., uncorrelated), oblique rotation is used for factors that correspond to each other (i.e., correlated) (DeVellis, 2016). That is, oblique rotation is the better method to use "when the underlying latent variables are believed to correlate somewhat with one another" (DeVellis, 2016, p.181). Given the correlation of the newly developed items, it was appropriate to employ and use oblique rotation in this study.

The pattern matrix was used to interpret the correlation between items and factors. An iterative process deleted items that had a factor loading lower than 0.40, high cross-loadings above 0.40, and low commonalities below 0.30 (Hair et al., 2009). The final factor analysis resulted in a seven-dimension solution with an eigenvalue greater than or equal to one and explained 63.53% of the total variance, indicating the acceptable variance explained in social science studies (Hair et al., 2019). Cronbach's alpha (i.e., coefficient alpha) values for the seven dimensions ranged from 0.815 to 0.867, all exceeding the cut-off value of 0.70 recommended by Nunnally and Bernstein (1994). The Kaiser-Meyer-Oklin (KMO) statistic (0.944) was greater

87

than the cut-off value of 0.60, suggesting that the sample was adequate for factor analysis.

Compared with the proposed VEQual model (i.e., nine dimensions), interestingly, seven factors were extracted as the result of the scale purification phase. Five of the nine proposed dimensions (i.e., functionality, ease of use, responsiveness, entertainment, and privacy/security) exactly matched those proposed by the findings of the qualitative inquiry, whereas four factors (i.e., vividness, design, information, and fulfillment) were broken down and merged into two distinct dimensions, namely, vividness and fulfillment, rather than being a separate dimension. More specifically, two items (i.e., design 2 and 4) of the design dimension were loaded with 4vividness, and an item (i.e., information 1) of the information was loaded with fulfillment. Table 18 summarizes the list of 35 items retained for scale validation using CFA.

Table 18

Items Retained Based on EFA

Dimensions	Cronbach's Alpha	Factor Loading	Corrected item-total correlation	Cronbach's Alpha if item deleted
Vividness	0.845			
The virtual event is optimized for online (e.g., website, mobile app) viewing		0.794	0.552	0.836
The imagery (e.g., video, images) used in the virtual event is accurate		0.776	0.686	0.808
The virtual event provides clear video and images		0.766	0.670	0.813
The imagery (e.g., video, images) used in the virtual event is vivid		0.731	0.636	0.818
Pictures/images used in the virtual event are always displayed properly		0.524	0.598	0.825
Text and image used in the virtual event are always displayed legibly		0.483	0.628	0.819
Functionality	0.840			
No interruptions interfered with participants' speaking and listening.		0.803	0.599	0.831
No errors occurred on the virtual event platform at any point		0.769	0.718	0.778
The virtual event provides a stable connection		0.703	0.715	0.785
Sound is clear and does not cut out during the virtual event		0.701	0.677	0.797
Ease of Use	0.825			
Using the virtual event's platform is not complicated		0.901	0.658	0.782
Using the virtual event's platform does not requires much effort		0.748	0.590	0.801
Only a few clicks take me where I want		0.599	0.600	0.796
The virtual event directs the customer step by step.		0.598	0.607	0.795
The organization and structure of the virtual event are easy to follow		0.557	0.658	0.779
Responsiveness	0.867			
Two-way communication is available in the virtual event		0.853	0.656	0.848
The virtual event provides real-time interaction service (e.g. chat)		0.781	0.587	0.860
If I want to, I could easily contact a customer service representative		0.773	0.680	0.842
The virtual event responds to attendee inquiries promptly		0.769	0.717	0.837
The virtual event provider demonstrates its willingness to help me		0.750	0.706	0.838

Help and support are available when problems are encountered		0.747	0.672	0.845
Entertainment	0.843			
The contents provided by the virtual event are entertaining		0.851	0.691	0.800
The contents provided by the virtual event are not boring		0.756	0.689	0.804
When the event ended, I felt that I enjoyed it and it left a lasting impression		0.653	0.610	0.822
The contents provided by the virtual event are interesting		0.638	0.620	0.823
The contents provided by the virtual event are attractive		0.590	0.662	0.807
Fulfillment	0.842			
The operating time of the virtual event programs is appropriate		0.798	0.671	0.804
The virtual event program properly reflects the purpose of the event		0.78	0.609	0.821
Programs/services of the virtual event were delivered by the time promised		0.745	0.667	0.805
Information provided by the virtual event is accurate		0.553	0.648	0.810
Programs/services of the virtual event were delivered as promised		0.538	0.642	0.812
Privacy/Security	0.815			
The virtual event protects information about my activity during the event		0.873	0.591	0.788
The virtual event protects information about my behavior related to event participation		0.867	0.568	0.797
The virtual event assured me that my personal information will not be shared with other parties		0.777	0.683	0.743
I feel secure in providing personal information for event participation		0.605	0.698	0.737

Study 4. Scale Validation (Quantitative Data Analysis 2)

Descriptive Statistics

A total of 500 usable responses were collected for scale validation. The majority of

respondents were male (68.0%) and between 35 and 44 years old (57.8%). More than half of

respondents (80.0%) reported having a bachelor's degree or graduate degree, indicating that most of the respondents had a higher level of education. In addition, 70.0% of the respondents were full-time employees, and the annual household income of 55.2% respondents was more than $100,000. The types of virtual events that respondents had attended were as follows: 26.0% attended sports events, 25.4% attended entertainment events, 24.8% attended business events, and 23.8% attended festivals and cultural events. The detailed demographic characteristics of the respondents are illustrated in Table 19.

Table 19

Demographic Characteristics of Respondents

Variable	Value	Frequency (*n*=500)	Percentage (%)
Gender	Male	340	68.0
	Female	160	32.0
Age	18-24	17	3.4
	25-34	104	20.8
	35-44	289	57.8
	45-54	26	5.2
	55-64	27	5.4
	65 or old	37	7.4
Education	High school or less	27	5.4
	Some college	51	10.2
	Associates' degree, trade/technical school	19	3.8
	Bachelor's degree	193	38.6
	Graduate degree	210	42.0
Job	Employed full time	350	70.0
	Employed part time	73	14.6
	Unemployed	23	4.6
	Retired	35	7.0
	Student	6	1.2
	Other	13	2.6
Household Income	Less than $50,000	75	15.0
	$50,000-$74,999	57	11.4
	75,000-$99,999	92	18.4
	$100,000-$149,999	196	39.2
	$150,000 or more	80	16.0
Marital Status	Single	55	11.0
	Married	418	83.6
	Divorced/widowed/separated	25	5.0
	Other	2	0.4
Ethnicity	White	471	94.2
	Black or African American	10	2.0
	American Indian or Alaska Native	2	0.4
	Asian	9	1.8
	Hispanic /Latin American	7	1.4
	Other	1	0.2
Type of Event	Festival or culture Event	119	23.8
	Business event	124	24.8

Entertainment event	127	25.4
Sports events	130	26.0

Confirmatory Factor Analysis for VEQual

A normality test was performed on all the items for each factor. All the items indicated significant deviations from normality, as confirmed by both the Kolmogorov-Smirnov test and the Shapiro-Wilk test (p<0.001) (Hair et al., 2019).

CFA was conducted using Mplus 7.4, and models were estimated using the normal theory maximum likelihood routine. To evaluate model fit, an inclusive approach was used involving a consideration of fit indices and the theoretical consistency and admissibility of parameter estimates. As the Chi-square can be oversensitive to minor model hypothesis testing (i.e., exact fit), three approximate fit indices were used: Root Mean Square Error of Approximation (RMSEA), ≤ 0.050 and 0.080 for close and reasonable fit, respectively; Comparative Fit Index (CFI), and Tucker-Lewis Index (TLI), ≥ 0.900 and 0.950 for acceptable and excellent fit, respectively (Hu & Bentler, 1999). The test of the seven-factor model resulted in an acceptable fit to the sample data: $\chi 2$ (539) =1304.606, p<0.001, RMSEA=0.053 (90% CI: 0.050, 0.057), CFI = 0.921, TLI = 0.912.

Reliability was assessed using two criteria Cronbach's alpha coefficients and composite reliability values. Cronbach's alpha (i.e., coefficient alpha) measures the internal consistency of how well a set of items measures a latent construct. In contrast, composite reliability refers to a "measure of the internal consistency of the construct indicator, depicting the degree to which they indicate the common latent (unobserved) construct" (Hair et al., 1998, pp. 583, 612). Composite reliability provides more accurate measure of reliability than Cronbach's alpha as "the items are weighted based on the construct indicators' individual loadings" (Hair et al.,

2019). In other words, while Cronbach's alpha is more likely to be conservative, composite reliability is more likely to be liberal and is therefore recommended to evaluate the two criteria to measure the construct's true reliability (Hair et al., 2019). As shown in Table 20, all constructs' Cronbach's alpha ranged from 0.822 to 0.871 and composite reliability values ranged from 0.877 to 0.904, which were higher than the recommended threshold value of 0.70 and exhibited satisfactory reliability (Bagozzi & Yi, 1988; Nunally & Bernstein, 1978).

To evaluate construct validity for the newly developed measurement scale, convergent validity and discriminant validity were tested. Convergent validity indicates "the extent to which the construct converges to explain the variance of its items," and discriminant validity refers to "the extent to which a construct is empirically distinct from other constructs in the structural model" (Hair et al., 2019, p.9). Convergent validity is evaluated by two measures, namely factor loading and Average Variance Extracted (AVE). As shown in Table 20, all factor loadings exceeded the threshold value of 0.60 at a significant level ($p<0.001$) (Bagozzi & Yi, 1988), and all AVE values were greater than the threshold value of 0.5 (Bagozzi & Yi, 1988), suggesting that the VEQual scale has convergent validity.

To assess discriminant validity, which refers to "the extent to which a construct is empirically distinct from other constructs in the structural model" (Hair et al., 2019, p.9), the Fornell and Larcker (1981) criterion was adopted. Fornell and Larcker (1981) suggested that the AVE value of each construct should be compared to the correlation of the inter-construct correlation. As shown in Table 21, the square root values of all constructs' AVE were higher than the corresponding inter-construct correlations, thereby verifying the discriminant validity of this study. As such, Study 4 confirmed the newly developed VEQual scale as a psychometrically sound measurement instrument that is valid, reliable, and stable.

Table 20

CFA Results for the VEQual Scale

Dimensions	Mean	std.dev	Factor Loading	Coefficient Alpha	Composite Reliability	AVE
Vivideness				0.871	0.904	0.611
VVD1	5.46	1.410	0.810			
VVD2	5.70	1.221	0.862			
VVD3	5.81	1.128	0.770			
VVD4	5.61	1.219	0.806			
VVD5	5.71	1.161	0.710			
VVD6	5.69	1.169	0.721			
Functionality				0.822	0.882	0.653
FCT1	5.48	1.300	0.765			
FCT2	5.58	1.212	0.805			
FCT3	5.70	1.135	0.840			
FCT4	5.77	1.166	0.820			
Ease of Use				0.824	0.877	0.587
EOU1	5.60	1.176	0.743			
EOU2	5.62	1.180	0.752			
EOU3	5.66	1.181	0.775			
EOU4	5.66	1.150	0.777			
EOU5	5.73	1.118	0.784			
Responsiveness				0.859	0.895	0.587
RPS1	5.11	1.496	0.728			
RPS2	5.40	1.442	0.748			
RPS3	5.27	1.401	0.793			
RPS4	5.35	1.263	0.800			
RPS5	5.46	1.221	0.806			
RPS6	5.54	1.191	0.716			
Entertainment				0.862	0.901	0.645
ETM1	5.66	1.204	0.750			
ETM2	5.79	1.118	0.773			
ETM3	5.90	1.084	0.852			
ETM4	5.90	1.014	0.820			
ETM5	5.79	1.092	0.816			
Fulfillment				0.862	0.900	0.644
FFM1	5.72	1.143	0.783			
FFM2	5.92	1.050	0.803			
FFM3	5.83	1.096	0.807			
FFM4	5.90	1.009	0.813			
FFM5	5.83	1.079	0.807			

Privacy/Security				0.838	0.891	0.672
PS1	5.57	1.231	0.850			
PS2	5.69	1.165	0.851			
PS3	5.77	1.209	0.806			
PS4	5.85	1.119	0.771			

Table 21

Results for Discriminant Validity

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) Vividness	*0.782*						
(2) Functionality	0.688	*0.808*					
(3) Ease of Use	0.683	0.651	*0.766*				
(4) Responsiveness	0.526	0.471	0.526	*0.766*			
(5) Entertainment	0.643	0.651	0.623	0.496	*0.803*		
(6) Fulfillment	0.671	0.619	0.666	0.517	0.685	*0.803*	
(7) Privacy/Security	0.574	0.547	0.572	0.635	0.621	0.641	*0.820*

Note: bold italics represent square root of average variance extracted, off-diagonal values indicate the correlations between inter-construct.

VVD1. [Virtual event] is optimized for online (e.g., website, mobile app) viewing.	0.810
VVD2. The imagery (e.g., video, images) used in [virtual event] is accurate.	0.862
VVD3. [Virtual event] provides clear video and images.	0.770
VVD4. The imagery (e.g., video, images) used in [virtual event] is vivid.	0.806
	0.710
VVD5. Pictures/images used in [virtual event] are always displayed properly.	
VVD6. Text and image used in [virtual event] are always displayed legibly.	0.721

Vividness

FCT1. No interruptions interfered with participants' speaking and listening.	0.765
FCT2. No errors occurred on [virtual event] platform at any point.	0.805
FCT3. [Virtual event] provides a stable connection.	0.840
FCT4. Sound is clear and does not cut out during [virtual event].	0.820

Functionality

EOU1. Using [Virtual event]'s platform is not complicated.	0.743
EOU2. Using [Virtual event]'s platform does not requires much effort.	0.752
EOU3. Only a few clicks take me where I want.	0.775
EOU4. [Virtual event] directs the customer step by step.	0.777
EOU5. The organization and structure of [virtual event] are easy to follow.	0.784

Ease of Use

RPS1. Two-way communication is available in [virtual event].	0.728
RPS2. [virtual event] provides real-time interaction service (e.g. chat).	0.748
RPS3. If I want to, I could easily contact a customer service representative.	0.793
RPS4. [virtual event] responds to attendee inquiries promptly.	0.800
RPS5. [virtual event] provider demonstrates its willingness to help me.	0.806
RPS6. Help and support are available when problems are encountered.	0.716

Responsiveness

ETM1. The contents provided by [virtual event] are entertaining.	0.750
ETM2. The contents provided by [virtual event] are not boring.	0.773
ETM3. When the event ended, I felt that I enjoyed it and it left a lasting impression.	0.852
ETM4. The contents provided by [virtual event] are interesting.	0.820
ETM5. The contents provided by [virtual event] are attractive.	0.816

Entertainment

FFM1. The operating time of [virtual event] programs is appropriate.	0.783
FFM2. [Virtual event] program properly reflects the purpose of the event.	0.803
FFM3. Programs/services of [virtual event] were delivered by the time promised.	0.807
FFM4. Information provided by [virtual event] is accurate.	0.813
FFM5. Programs/services of [virtual event] were delivered as promised.	0.807

Fulfillment

PS1. [Virtual event] protects information about my activity during the event.	0.850
PS2. [Virtual event] protects information about my behavior related to event participation	0.851
PS3. [Virtual event] assured me that my personal information will not be shared with other parties	0.806
PS4. I feel secure in providing personal information for event participation.	0.771

Privacy/ Security

Notes: All standardized coefficients are significant at the α=0.001. Dotted lines indicate correlations

Figure 10. Confirmatory Factor Analysis: The Seven-Factor VEQual Scale

Second-Order Factor Model

A second-order factor model is commonly used in studies where the measurement tool measures several related constructs evaluated by multiple items (Chin, 1998; Kim et al., 2020). In a second-order model, the first-order factors act as indicators of a broader and more comprising second-order factor (Hair et al., 2006). Such a model indicates "the hypothesis that the seemingly distinct, but related, sub-dimensions can be accounted for by an underlying higher-order construct such as service quality" (Nunkoo et al., 2017). As a second-order factor model can offer a more parsimonious and interpretable model than the first-order factors model, many previous studies that developed a service quality scale using a multidimensional construct had adopted this approach (e.g., Bauer et al., 2006; Fassnacht & Koese, 2006; Parasuraman et al., 2005); subsequently, it was empirically confirmed that service quality could play the role of a second-order factor (Narayan et al., 2008; Nunkoo et al., 2017). Therefore, the current study treated VEQual as a second-order construct using the newly developed seven factors (i.e., vividness, functionality, ease of use, responsiveness, entertainment, fulfillment, and privacy/security).

Model Comparison

To test the performance of the second-order factor model of VEQual, this study followed a recommended procedure outlined by Rindskopf and Rose (1988) and developed three different models, as represented in Figure 11. Model 1 is a single first-order factor model in which all the VEQual indicators are loaded, and Model 2 is the seven first-order factor model in which seven dimensions of VEQual are correlated without a second-order factor. Model 3 was the second-order factor model of VEQual. To compare these models, CFA was performed, and the results are shown in Table 22. While Model 1 failed to lead to acceptable model fit indices, Model 2 and Model 3 did. More specifically, although Model 2 produced slightly better model fit indices

(χ^2/df = 2.420, CFI = 0.921, TLI = 0.912, RMSEA = 0.053, SRMR = 0.039) than Model 3 (χ^2/df = 2.520, CFI = 0.913, TLI = 0.906, RMSEA = 0.055, SRMR = 0.045), Model 3 can also be used in further investigation of nomological validity.

Table 22

Comparison of Model Fit Indices

	χ^2	df	χ^2/df	CFI	TLI	RMSEA	SRMR
M1. Single factor model	2904.175	560	5.186	0.757	0.742	0.091	0.066
M2. Oblique seven factor model	1304.606	539	2.420	0.921	0.912	0.053	0.039
M3. Second-order factor	1393.768	553	2.520	0.913	0.906	0.055	0.045

M1. Single-factor model   M2. Oblique seven-factor model   M3. Second-order factor model
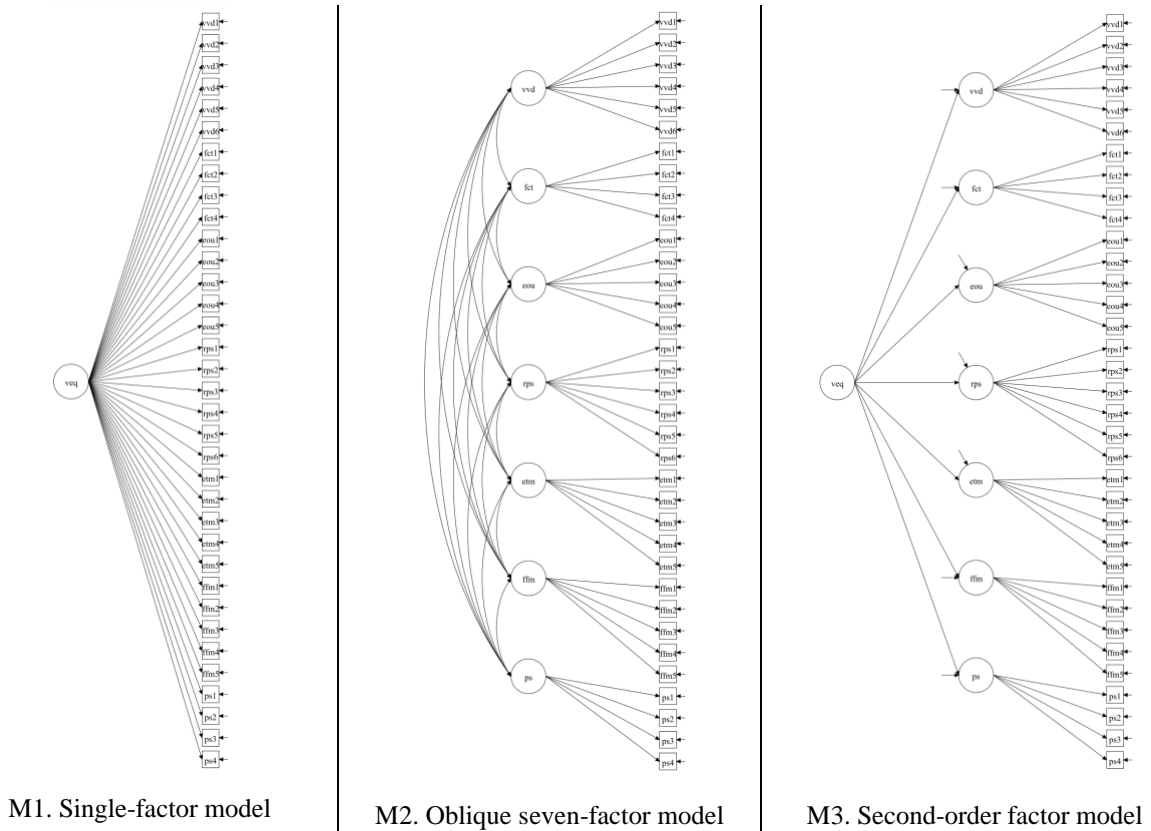
Figure 11. Model comparison

Study 5. Nomological Validation (Quantitative Data Analysis 3)

Descriptive Statistics

A total of 699 complete and usable responses were collected for testing the nomological validity. The majority of the respondents in the sample were female (60.5%), and 79.0% of them were in the 18–34 age category. Almost half of the respondents had a university or graduate degree (48.9%), and 47.8% and 47.6% of the respondents were married and full-time employees, respectively. The annual income of more than a third of the respondents (42.5%) was $50,000–100,000. As mentioned in Chapter 3 (research methodology), this study adopted the quota sampling method to attain adequate variance in the data. Therefore, the types of virtual events attended by the survey respondents accounted for nearly 25% of each: festival and cultural events (24.7%), business events (25%), entertainment events (24.9%), and sports events (25.3%). The detailed demographic characteristics of the respondents are summarized in Table 23.

Table 23

Demographic Characteristics of Respondents

Variable	Value	Frequency (n=699)	Percentage (%)
Gender	Male	276	39.5
	Female	423	60.5
Age	18-24	238	47.6
	25-34	157	31.4
	35-44	163	32.6
	45-54	35	7.0
	55-64	44	8.8
	65 or old	62	12.4
Education	High school or less	116	16.6
	Some college	154	22.0
	Associates' degree, trade/technical school	87	12.4
	Bachelor's degree	175	25.0
	Graduate degree	167	23.9
Job	Employed full time	333	47.6
	Employed part time	152	21.7
	Unemployed	63	9
	Retired	65	9.3
	Student	64	9.2
	Other	22	3.1
Household Income	Less than $50,000	196	28
	$50,000-$74,999	167	23.9
	75,000-$99,999	130	18.6
	$100,000-$149,999	124	17.7
	$150,000 or more	82	11.7
Marital Status	Single	295	42.2
	Married	334	47.8
	Divorced/widowed/separated	56	8
	Other	14	2
Ethnicity	White	437	62.5
	Black or African American	130	18.6
	American Indian or Alaska Native	14	2
	Asian	44	6.3
	Native Hawaiian or Pacific Islander	2	0.3
	Hispanic /Latin American	58	8.3
	Other	14	2
Type of Event	Festival or culture Event	173	24.7
	Business event	175	25
	Entertainment event	174	24.9
	Sports events	177	25.3

Covariance-based Structural Equation Modeling (CB-SEM)

The SEM approach was used to examine the relationships between the newly developed VEQual measurement and extant focal constructs. SEM can be similar to multiple regression in terms of testing relationships between variables. However, SEM has been more commonly utilized in previous research since it allows researchers to test multilevel dependence relationships simultaneously (Hair et al., 2019). There are two SEM approaches, namely covariance-based structural equation modeling (CB-SEM) and partial least modeling structural equation modeling (PLS-SEM). While PLS-SEM utilizes the estimation method of regression-based ordinary least squares (OLS) and its main goal is to predict key constructs, CB-SEM adopts the maximum likelihood (ML) estimation procedure and is usually used for theory testing and confirmation (Hair et al., 2011). CB-SEM has been considered superior to PLS-SEM when determining whether a proposed research model is "a sufficiently good way to model the relationships among the variables, that the complete set of paths specified in the model is plausible given the sample" (Tussyadiah et al., 2018, p.602). As the purpose of Study 5 is to test the nomological validity of the newly developed VEQual scale in an overall good fit of the proposed research model, this study adopted the CB-SEM approach and followed the guiding principles outlined by Anderson and Gerbing (1988) in analyzing the collected data; the adequacy of the measurement model was initially tested with CFA, followed by an assessment of the adequacy of the structural model to test the proposed hypotheses.

Assumptions of Multivariate Analysis

Before conducting the nomological validity test, the collected data were investigated to check if multivariate assumptions were violated. As a rule of thumb, normality, linearity, homoscedasticity, and multicollinearity are usually used to ensure multivariate assumptions.

First, a multivariate normality test was performed on all 49 items of each construct using both the Kolmogorov-Smirnov test and the Shapiro-Wilk test. The results indicate that the observed distribution of all the items was significantly normal (p<0.001) (Hair et al., 2016). Second, to assess linearity and homoscedasticity, bivariate scatter plots between pairs of variables were used. As it was not pragmatic to inspect every inter-item linear relationship by generating pairwise scatterplots, a spot check on several plots was considered sufficient (Tabachnick et al., 2007). The results of randomly inspecting 10 bivariate scatter plots show that there was no clear evidence of curvilinearity or heteroscedasticity, asserting that the collected data were satisfactory to be tested for multivariate analysis. Third, the multicollinearity of each independent variable was assessed using a variance inflation factor (VIF). All values of VIF fell between 1.882 and 3.618, which were less than the cut-off value of 10 (Hair et al., 2010); thus, the assumption of multicollinearity was not violated in this study. To avoid missing data, the forced answering option was adopted.

Nonresponse Bias Test

Following Armstrong and Overton's (1977) recommendation, the nonresponse bias was evaluated by comparing early responses (top 100) and late responses (bottom 100). The Chi-square test conducted on demographic characteristics showed that there are no significant differences between the two groups (i.e., early and late responses), with the exception of gender (χ^2=8.894, p=.012). In addition, the t-tests results indicate that all the measured 49 items were not significantly different between early and late respondents, except two items (i.e., RPS 6 and PS 4). Therefore, nonresponse bias is not an issue in this study's statistical results.

Factorial Invariance Test

Factorial invariance or measurement invariance refers to "the extent to which the psychometric properties of the observed indicators are transportable (generalizable) across

groups or over time" (Boateng et al., 2018, p.11). To ensure the validity of the developed

VEQual scale, the equality of factor loading between two samples (i.e., collected data for Studies

4 and 5) should be assured (Kim et al., 2010; So et al., 2014). Therefore, a measurement

invariance test using multigroup CFA was conducted to examine if the measurement model of

seven VEQual dimensions is equivalent across the two groups of samples. As indicated in Table

24, the Chi-square difference between the two models (i.e., the unconstrained and full metric

invariance model) was not significant, $\Delta\chi^2$ (28) = 24.432, p >.05, suggesting that the equality of

factor loading was ensured between the two samples.

Table 24

Results for Factor Invariance Test across Samples

	χ^2	df	p-value	CFI	TLI	RMSEA	SRMR
Unconstrained	2863.676	1078	0.00	0.929	0.921	0.053	0.035
Full metric invariance	2888.107	1106	0.00	0.929	0.923	0.052	0.038

Assessment of Measurement Model: First-Order CFA

To test nomological validity, the VEQual scale was considered as a second-order factor,

where the first-order factors (i.e., seven factors of VEQual) played the role of sub-dimensions of

the second-order construct (Hair et al., 2006; Koufteros et al., 2009; Nunkoo et al., 2017).

To assess the measurement model using second-order factor structures, higher-order (i.e., first

order) CFA should be conducted first to ensure that the first-order factor measurement model is

well-defined (Marsh & Bailey, 1991). Therefore, this study assessed a first-order measurement

model of all variables and, in turn, evaluated the second-order CFA to test the second-order

factor model of VEQual using the maximum likelihood method of estimation.

104

In terms of model fit, the test of the first-order factor model resulted in a good fit to the sample data (χ^2/df = 2.602, CFI = 0.924, TLI = 0.917, RMSEA = 0.049, SRMR = 0.033). To ensure reliability, Cronbach's alpha and composite reliability were computed. As shown in Table 25, all constructs' Cronbach's alpha and composite reliability values are higher than the recommended threshold value of 0.70 and thereby exhibit satisfactory reliability (Bagozzi & Yi, 1988; Nunally & Bernstein, 1978). Convergent validity was assessed using standardized factor loading and AVE values. Table 25 indicates that all factor loadings exceeded the threshold value of 0.60 at a significant level ($p<0.001$) (Bagozzi & Yi, 1988), and all AVE values were greater than the threshold value of 0.5 (Bagozzi & Yi, 1988), indicating the presence of convergent validity.

The criterion proposed by Fornell and Larcker (1981) was employed to evaluate discriminant validity. As shown in Table 26, the square root values of all constructs' AVE were higher than the corresponding inter-construct correlations, except for entertainment, whose square root of AVE was greater than its correlation with fulfillment. Therefore, the current study conducted a further test to assess whether the correlation between constructs is significantly less than one (Anderson & Gerbing, 1988; Bagozzi & Heatherton, 1994). If the value of one is not included in the 95% confidence interval, discriminant validity is established. The highest correlation between entertainment and fulfillment was 0.785. The confidence interval between these two constructs was 0.739–0.831, indicating discriminant validity for all pairs of constructs.

Table 25

Results of the Measurement Model.

Dimensions	Mean	std.dev	Factor Loading	Coefficient Alpha	Composite Reliability	AVE
Vividness				0.906	0.909	0.626
VVD1	4.67	1.861	0.748			
VVD2	4.96	1.661	0.786			
VVD3	5.03	1.630	0.866			
VVD4	5.00	1.622	0.784			
VVD5	5.03	1.601	0.803			
VVD6	5.16	1.516	0.755			
Functionality				0.847	0.852	0.591
FCT1	4.82	1.668	0.729			
FCT2	4.92	1.580	0.804			
FCT3	5.14	1.497	0.802			
FCT4	5.07	1.585	0.738			
Ease of Use				0.883	0.888	0.614
EOU1	4.98	1.641	0.768			
EOU2	5.18	1.514	0.770			
EOU3	5.31	1.450	0.795			
EOU4	5.10	1.490	0.770			
EOU5	5.15	1.514	0.815			
Responsiveness				0.879	0.881	0.553
RPS1	4.54	1.757	0.716			
RPS2	4.84	1.606	0.725			
RPS3	4.69	1.558	0.732			
RPS4	4.81	1.570	0.753			
RPS5	4.92	1.480	0.798			
RPS6	5.03	1.497	0.735			
Entertainment				0.871	0.871	0.574
ETM1	5.06	1.585	0.716			
ETM2	5.26	1.462	0.765			
ETM3	5.27	1.449	0.768			
ETM4	5.26	1.481	0.768			
ETM5	5.17	1.459	0.769			
Fulfillment				0.845	0.850	0.531
FFM1	5.07	1.623	0.677			
FFM2	5.35	1.376	0.755			
FFM3	5.29	1.400	0.744			
FFM4	5.35	1.378	0.735			
FFM5	5.28	1.447	0.731			
Privacy/Security				0.831	0.832	0.553
PS1	4.91	1.597	0.707			

PS2	4.99	1.497	0.756			
PS3	5.10	1.494	0.752			
PS4	5.15	1.483	0.757			
Social Presence				0.857	0.857	0.600
SP1	4.71	1.682	0.773			
SP2	5.02	1.536	0.806			
SP3	4.90	1.57	0.794			
SP4	4.98	1.556	0.721			
Satisfaction				0.844	0.841	0.639
SAT1	5.06	1.626	0.768			
SAT2	5.27	1.398	0.811			
SAT3	5.29	1.405	0.818			
Revisit Intention				0.870	0.873	0.632
RVI1	4.92	1.677	0.752			
RVI2	5.09	1.529	0.818			
RVI3	5.11	1.529	0.812			
RVI4	5.07	1.574	0.795			

Table 26

Discriminant Validity Analysis from First-Order CFA

	VVD	FCT	EOU	RPS	ETM	FFM	PS	SP	SAT	RVI
VVD	*0.791*									
FCT	0.707	*0.768*								
EOU	0.692	0.677	*0.825*							
RPS	0.536	0.534	0.576	*0.790*						
ETM	0.669	0.627	0.678	0.569	*0.757*					
FFM	0.688	0.598	0.710	0.581	0.785	*0.729*				
PS	0.591	0.558	0.614	0.617	0.640	0.705	*0.744*			
SP	0.602	0.561	0.618	0.608	0.671	0.691	0.662	*0.775*		
SAT	0.617	0.566	0.625	0.517	0.705	0.726	0.649	0.704	*0.799*	
RVI	0.521	0.487	0.531	0.532	0.656	0.594	0.567	0.605	0.681	*0.795*

Note: bold italics represent square root of average variance extracted, off-diagonal values indicate the correlations between inter-construct's correlation. VVD = Vividness; FCT = Functionality; EOU = Ease of Use; RPS = Responsiveness; ETM = Entertainment; FFM = Fulfillment; PS = Privacy/Security; SP = Social Presence; SAT = Satisfaction; RVI = Revisit Intention.

Assessment of Measurement Model: Second-Order CFA

In the second-order factor measurement model, a hierarchical CFA with correlated constructs (i.e., VEQual, social presence, satisfaction, and revisit intention) was tested as a first-order factor model. The goodness-of-fit statistics were obtained, and they suggested an acceptable fit to the sample data. (χ^2/df = 2.760, CFI = 0.914, TLI = 0.909, RMSEA = 0.052, SRMR = 0.040). Given that the construct validity and reliability of social presence, satisfaction, and revisit intention were tested in the first-order factor model, this assessment primarily focused on the second-order factor, VEQual.

As illustrated in Table 27, the standardized factor loadings of seven dimensions of VEQual were all significant at the α=0.001 level. Both Cronbach's alpha and composite reliability values exceeded the cutoff value of 0.70 (Bagozzi & Yi, 1988; Nunally & Bernstein, 1978), suggesting the satisfactory reliability of the VEQual construct. In addition, the AVE value was also significantly greater than the threshold value of 0.5 (Bagozzi & Yi, 1988), supporting convergent validity. Discriminant validity of the second-order factor (VEQual) and three other first-order factors (i.e., social presence, satisfaction, and revisit intention) was also ensured, as all square roots of the AVE values were greater than the correlations between the inter-constructs (Fornell & Larcker, 1981).

Testing for Common Method Bias

As the collected data were from a self-reported survey with a single questionnaire, common method bias was an issue to deal with in this study. Podsakoff and Todor (1985) stated that "Invariably, when self-report measures obtained from the same sample are utilized in research, concern over same-source bias or general method variance arises" (p. 65). Therefore, the current study performed a statistical analysis to test common method bias by using Harman's single factor test (Podsakoff et al., 2003). This test was conducted using EFA with an unrotated

solution. The results indicate that the most variance explained by one factor was 44.64%, which was less than the threshold value of 50%, suggesting that common method bias was not an issue in this study.

Table 27

Results of the Measurement Model Analysis

Dimensions		Factor Loading	Cronbach's Alpha	Composite reliability	AVE
Virtual event quality (VEQual)			0.924	0.941	0.726
VVD	Vividness	0.827			
FCT	Functionality	0.799			
EOU	Ease of Use	0.865			
RPS	Responsiveness	0.743			
ETM	Entertainment	0.915			
FFM	Fulfillment	0.948			
PS	Privacy/Security	0.856			
Social Presence			0.857	0.857	0.599
SP1	There is a sense of human contact in the virtual event.	0.772			
SP2	There is a sense of sociability in the virtual event.	0.805			
SP3	There is a sense of human warmth in the virtual event.	0.794			
SP4	There is a sense of human sensitivity in the virtual event.	0.723			
Satisfaction			0.844	0.841	0.639
SAT1	I am satisfied with my decision to participate in the virtual event.	0.763			
SAT2	The virtual event did a good job of satisfying my needs	0.816			
SAT3	I am satisfied with the experience in the virtual event.	0.818			
Revisit Intention			0.870	0.872	0.631
RVI1	I intend to revisit the virtual event in the future	0.751			
RVI2	I plan to revisit the virtual event in the future	0.818			
RVI3	I desire to visit the virtual event in the future	0.813			
RVI4	I probably will revisit the virtual event in the future	0.794			

Table 28

Discriminant Validity Analysis

	Virtual event quality	Social presence	Satisfaction	Revisit intention
Virtual event quality	*0.853*			
Social presence	0.723	*0.773*		
Satisfaction	0.741	0.704	*0.799*	
Revisit intention	0.633	0.605	0.681	*0.794*

Note: bold italics represent square root of average variance extracted, off-diagonal values indicate the correlations between inter-construct's correlation.

Assessment of Structural Model

The overall structural model also indicated a good model fit, with χ^2/df = 2.763, $p <$ 0.05, CFI = 0.914, TLI = 0.909, RMSEA = 0.052, and SRMR = 0.040. The second-order variable, VEQual, presented significant paths to each subcomponent: vividness (β = 0.827, $p <$ 0.001), functionality (β = 0.827, $p <$ 0.001), ease of use (β = 0.827, $p <$ 0.001), responsiveness (β = 0.827, $p <$ 0.001), entertainment (β = 0.827, $p <$ 0.001), fulfillment (β = 0.827, $p <$ 0.001), and privacy/security (β = 0.827, $p <$ 0.001).

In the context of hypotheses testing, five hypotheses were supported, as depicted in Table 29. Specifically, VEQual (β = 0.599, $p <$ 0.001) and social presence (β = 0.313, $p <$ 0.001) had a significant positive effect on satisfaction and explained the 77.4% variance in satisfaction (R^2 = 0.774, $p <$ 0.001), thereby supporting hypothesis 1 and 5, respectively. VEQual had a statistically significant influence on social presence (β = 0.844, $p <$ 0.001) and explained the 71.2% variance in social presence (R^2 = 0.712, $p <$ 0.001), supporting hypothesis 4. Moreover, VEQual (β = 0.224, $p <$ 0.05) and satisfaction (β = 0.574, $p <$ 0.001) had a significant effect on revisit intention, supporting hypothesis 2 and 3, respectively. Social presence had no significant direct influence on revisit intention (β = 0.024, $p >$ 0.05) and did not support hypothesis 6.

Table 29

Results for Structural Model Analysis

Hypotheses	Paths	Estimates	*p*-Values	Results
H1	Virtual event quality → Satisfaction	0.599	< 0.001	Supported
H2	Virtual event quality → Revisit intention	0.224	0.013	Supported
H3	Satisfaction → Revisit intention	0.574	< 0.001	Supported
H4	Virtual event quality → Social presence	0.844	< 0.001	Supported
H5	Social presence → Satisfaction	0.313	< 0.001	Supported
H6	Social presence → Revisit intention	0.024	0.765	Not Supported
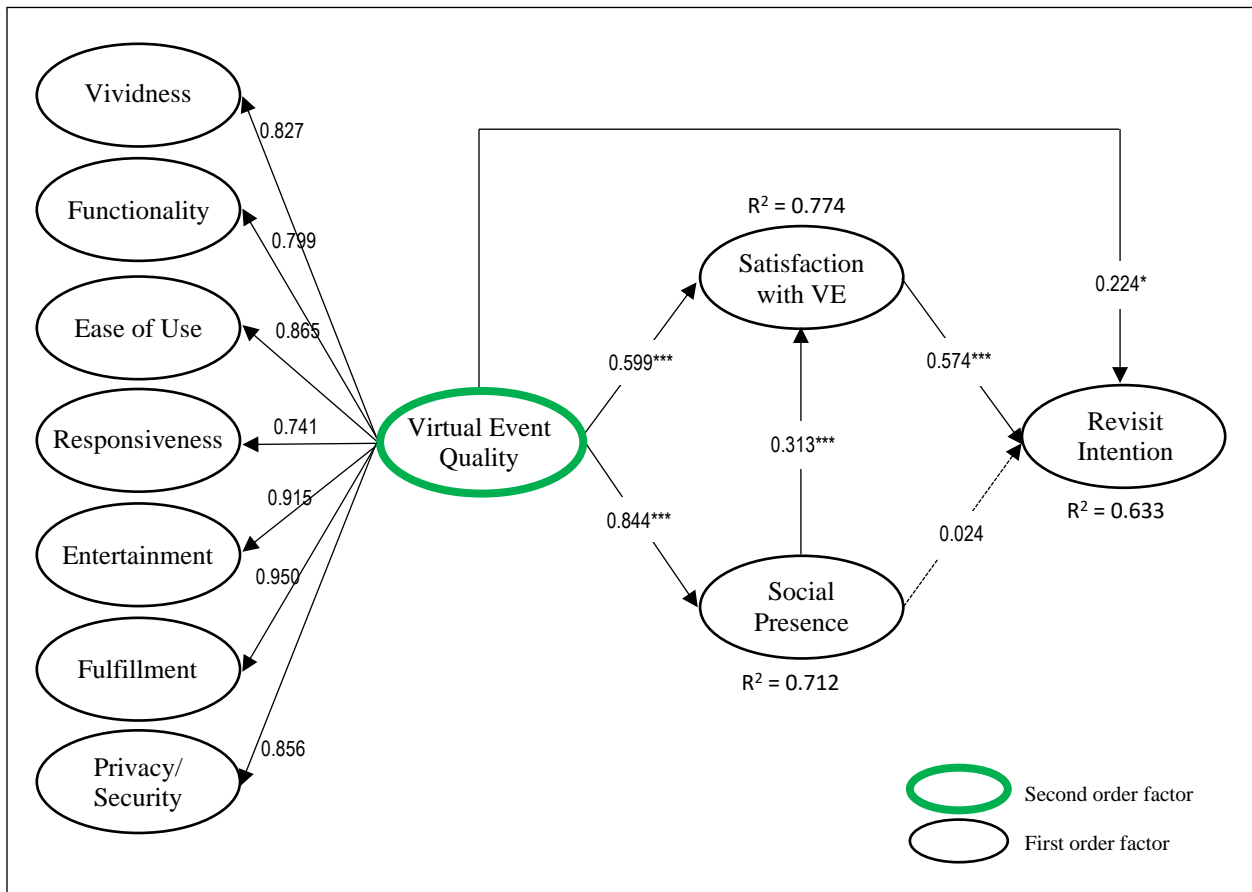
Figure 12. Graphical Depiction of the Structual Relationships

Apart from the proposed hypotheses, this study assessed the significance of the indirect effects of predictor variables on satisfaction and revisit intention. Table 30 presents the indirect and total effects of exogenous variables. VEQual had a significant indirect effect on satisfaction with virtual events (β=0.242, p<0.001) via social presence. Also, VEQual indirectly affected revisit intention (β=0.538, p<0.001) via social presence and satisfaction, respectively. Likewise, social presence had an indirect effect on revisit intention (β=0.207, p<0.001) via satisfaction with virtual events.

Table 30

Direct, Indirect, and Total Effect - Estimates

| Predictors | Criterion variable | | | | | |
| | Satisfaction with virtual event | | | Revisit intention | | |
	Direct effects	Indirect effects	Total effects	Direct effects	Indirect effects	Total effects
VEQual	0.633***	0.242***	0.875***	-	0.538***	0.538***
Social Presence	0.286***			0.096	0.207***	0.303***

Note: *** Signicant at p<0.001

CHAPTER 5.

DISCUSSION AND CONCLUSION

To conclude this dissertation, this chapter provides findings and implications derived from Studies 1 and 5. The discussion focuses on two sections: dimensionality and research model testing. Theoretical and practical implications are also discussed based on the results of the two studies. Finally, research limitations and directions for future research are presented.

Summary of Findings

The primary objectives of this study were (1) to develop and validate a scale to measure VEQual in the context of event management based on the perspective of performance-focused service quality and (2) to use the newly developed measurement through a meaningful conceptual model based on social presence theory and the IS success model to verify its predictive validity. To achieve these two goals, this study primarily depended on Churchill's paradigm (1997) and used other salient literature (e.g., DeVellis, 2016; Worthington & Whittaker, 2006) as supplementary guidance to develop a more robust and useful instrument. This study consists of five studies: (1) qualitative inquiry, (2) initial screening, (3) scale purification, (4) scale validation, and (5) nomological validation.

Following Churchill's scale-development procedures, first, a critical literature review was conducted by focusing on the virtual event market, event quality, and e-service quality; this provided an overview of the reviewed VEQual conceptualization. In addition, semi-structural in-depth interviews were conducted with virtual event stakeholders to explore the key dimensions of VEQual. Based on the results of qualitative inquiry (i.e., literature review and interviews), an initial set of 93 items with nine dimensions was generated. These dimensions are "vividness," "design," "functionality," "ease of use," "information," "responsiveness," "entertainment,"

"fulfillment," and "privacy/security."

Second, to ensure validity and readability, initial screening was conducted. All items were reviewed and screened sequentially by a panel of subject experts consisting of event faculties, event consumers, and event practitioners. As a result, 48 items were retained for the first quantitative analysis.

Third, to verify dimensionality and ensure scale reliability, scale purification was implemented by collecting and analyzing 498 responses from participants who had participated in a virtual event over the last six months. During this phase, two venturesome dimensions (i.e., design and information) were detected and discarded from the measurement. A total of 35 items with seven dimensions were retained and used for the next quantitative analysis.

Fourth, to validate the developed VEQual scale, construct validity and discriminant validity were examined by collecting and analyzing a new sample of 500 responses. The results of the scale-validation phase suggested that there were no items or dimensions to be excluded; consequently, 35 items and seven dimensions were retained for the third quantitative analysis, i.e., a nomological validity test.

Finally, in Study 5, the relationship between VEQual and other focal constructs in event literature was analyzed using a new sample of 699 event attendees to examine the VEQual scale's usefulness in a robust theoretical framework (Venkatraman & Grant, 1986). Of the five hypotheses, four were supported, and an acceptable predictive validity of VEQual was confirmed.

Discussion

Dimensionality of the VEQual Construct

The current study successfully developed a scale that measures VEQual. The seven

dimensions of VEQual were identified, and 35 measurement items were established. Initially, the generated items were screened via a critical review procedure and purified using quantitative data analysis. Two more quantitative analyses revealed that the reliability of the VEQual scale was high and that construct validity and discriminant validity were well-ensured. Consequently, the newly developed VEQual scale provides holistic and comprehensive measurements to evaluate the performance of virtual events. In line with e-service quality studies (Ladhari, 2010), this study also confirmed that VEQual is a multidimensional scale with satisfactory psychometric properties. According to the results of this study, virtual event attendees placed emphasis on vividness, functionality, ease of use, responsiveness, entertainment, fulfillment, and privacy/security. The multiple analyses also revealed that these seven dimensions were highly correlated and can be considered as second-order factor structures.

As mentioned in the literature review section, six common dimensions appear consistently in previous scale-development studies dealing with e-service quality across various disciplines: reliability/fulfillment, responsiveness, ease of use/usability, privacy/security, web design, and information quality (Ladhari, 2010). Of the seven dimensions developed in this study, five (i.e., functionality, ease of use, responsiveness, fulfillment, and privacy/security) overlap with the commonly appearing six dimensions in previous studies (Ding et al., 2011; Fassnacht & Koese, 2006; Ho & Lee, 2007; Hammoud et al., 2018; Janita & Miranda, 2013; Kaur et al., 2020; Parasuraman et al., 2005; Ting et al., 2016; Tsang et al., 2010; Wolfinbarger & Gilly, 2003). These important dimensions were successfully confirmed in the context of virtual events. More importantly, these dimensions were optimized and tailored to the virtual event context and presented more profound meanings of each dimension than those discussed in earlier studies.

In particular, according to the results, "fulfillment" was confirmed as the most crucial factor related to VEQual perception (β=0.945). Fulfillment contains five items associated with the level of accuracy and timeliness of fulfilling promised services or programs in virtual events. As an event attendee usually participates in an event with a particular purpose, including attaining utilitarian and/or hedonic benefits (Getz, 2007; Gursoy et al., 2006), fulfilling the promised purposes within the promised time is a critical component affecting VEQual. This corresponds to a number of studies that identified fulfillment as a strong determinant of overall quality (e.g., Bauer et al., 2006; Wolfinbarger & Gilly, 2003).

Interestingly, two distinct dimensions (i.e., vividness and entertainment), which only a few studies have paid attention to, emerged and were validated as seminal determinants of VEQual perception by reflecting contemporary changes in the marketplace. "Vividness" consists of six items and measures the level of accuracy, clearness, and legibility of the imagery provided in a virtual event. With advanced technologies and innovation, it has become possible for each individual to own personal equipment (e.g., smartphones) that provides a high level of clarity at a lower price than ever before. This facet enables people to be interested in the degree of vividness of various imagery, such as images and videos. Theoretically, vividness plays an important role in a virtual event because this feature allows event attendees to experience the feeling of realistic participation (Lee et al., 2020). In addition, unlike a regular service (e.g., e-commerce) provided on the Internet, participating in a virtual event may consume more time, and, in turn, one can be easily distracted by the surroundings. As increases in vividness are associated with an increased feeling of presence and a more enduring attitude toward the virtual environment (Coyle & Thorson, 2001), the importance of vividness quality is expected to become more significant in the virtual event context.

116

"Entertainment" contains five items measuring the level of programs'/contents' entertainment quotient in a virtual event. In a virtual environment, entertaining or amusing aspects play a key significant role in predicting consumers' behavioral intentions (Kim et al., 2020). Compared to traditional in-person events, in a virtual event, an attendee can be easily distracted by the surroundings and drop off through a simple "click." As indicated by several interviewees (i.e., R8, R10, and R14), in this study, the entertainment quotient of virtual events is considered important regardless of the type of events in terms of enabling event attendees to immerse themselves in the virtual events (Kim et al., 2020). Therefore, entertainment emerged as another new key factor in measuring the perceived quality of virtual events.

Another interesting finding is that two (i.e., design and information) of the nine proposed dimensions of VEQual, which were developed through qualitative inquiry, were broken down and merged into two different dimensions, vividness and fulfillment. Given across-dimension similarities or commonality of items, this dimension-converging result has often been seen in various scale-development studies (e.g., Ho & Lee, 2007; Llosa et al., 1998; Wolfinbarger & Gilly, 2003). Another plausible explanation is that since virtual events might still be in the initial stages, such as in terms of introduction or growth of the product (service) life cycle, from the perspective of event attendees, the design or information aspect is not a core service they highly pay attention to when participating in an event; it is rather considered a peripheral service (Kandampully & Solnet, 2015).

Comparison with Traditional Event-Quality Dimensions

Although VEQual is subject to events held in a virtual environment usually without physical components, some dimensions were identical or similar to those used to characterize traditional in-person event quality. For example, fun or entertainment, which is one of the important dimensions in traditional offline events, has been reported in a number of event quality

studies (e.g., Baker & Crompton, 2000; Carneiro et al., 2019; Gannon et al., 2019; Gottlieb et al., 2011). Similarly, fulfillment or outcome, which is based on timeframe, service/program delivery, and item presentation, has also been reported in numerous traditional event quality studies (e.g., Gottlieb et al., 2011; Jang et al., 2020; Jin et al., 2013; Ko & Pastore, 2004; Ko et al., 2011; Wong et al., 2015). However, given that VEQual was developed in the web-based context, it has some interpretational differences from traditional event quality dimensions. For example, responsiveness in a traditional event includes a measurement to evaluate interpersonal service in a physical place, whereas in a virtual event, it is limited to responses or services without a physical facet.

It is extremely important to note that most traditional dimensions of physical event quality are not applicable to VEQual, as these dimensions are more likely to focus on the operationalization of the physical surroundings of an event, such as atmosphere, venue, and design (e.g., Bitner, 1992; Carneiro et al., 2019; Jang et al., 2020). For example, "facilities," which appears as a critical dimension for evaluating event quality in almost all event quality studies (Carneiro et al., 2019; Jang et al., 2020; Jin et al., 2013; Jung, 2005; Ko & Pastore, 2004; Ko et al., 2011; Son & Lee, 2011; Theodorakis et al., 2001; Wong et al., 2015; Yoon et al., 2010), is evidently of less interest in virtual environments. Furthermore, it is not surprising to apply a measurement developed for a certain type of event (e.g., festival) to another type of event (e.g., business event) is not available, as in the traditional in-person events, extant event quality dimensions were likely to be contingent on the specific event context, such as sports events, festivals, and conferences. However, VEQual can be more widely applicable in measuring any type of event's performance from the perspective of customers.

Comparison with e-Service Quality Dimensions

Following the comparison method of Bauer et al. (2006), the current study compared the

newly developed scale "VEQual" with three well-developed salient scales, namely, the E-S-Qual scale (i.e., e-service quality), developed by Parasuraman et al. (2005); e-Travel SQ scale (e-travel service quality), developed by Ho and Lee (2007); and eTailQ scale (i.e., e-retail quality) developed by Wolfinbarger and Gilly (2003). As illustrated in Figure 13, the VEQual scale appears to comprehensively explain the entirely relevant aspects of quality perception that extant studies deal with. The findings of this study amalgamated utilitarian quality aspects with hedonic quality aspects (i.e., vividness and entertainment), which neither E-S-Qual, e-Travel SQ, nor eTailQ have considered. The importance of hedonic aspects in evaluating virtual events' performance has been proven through literature reviews (e.g., Baker & Crompton, 2000; Carneiro et al., 2019; Gottlieb et al., 2011). People participate in events to pursue not only utilitarian benefits but also hedonic benefits (Gursoy et al., 2006). This distinct characteristic was confirmed by the results of both the interviews and scale-validation procedures, and parallel those achieved by Bauer et al. (2006), who developed e-shopping quality (i.e., eTransQual) and pointed out the importance of hedonic and emotional motives.

In contrast to the findings of Ho and Lee (2007) and Parasuraman et al. (2005), in the current study, responsiveness was extracted as a broader scale integrating the concept of customer service or relationship. The possible reason for these findings is that events are not a service that people use whenever they want, such as online retail or e-commerce (Wolfinbarger & Gilly, 2003). That is, a virtual event is usually held temporarily for a "certain period," even if it is held regularly or periodically, which is a unique characteristic of events (Getz, 2007). Therefore, an event attendee may perceive customer service and responsiveness in a virtual event as an integrated measure to evaluate the virtual event's performance.

eTailQ (Wolfinbarger & Gilly, 2003)	e-Travel SQ (Ho & Lee, 2007)	VEQual	E-S-Qual (Parasuraman et al., 2005)	
			Core E-S-Qual	E-RecS-Qual
				Compensation (3)
	Customer Relationships (3)	Responsiveness (6)		Contact (3)
Customer Service (3)	Responsiveness (3)			Responsiveness(4)
Fulfillment (3)	Infortmation Quality (3)	Fulfillment (5)	Fulfillment (7)	
Privacy (3)	Security (3)	Privacy/Security (4)	Privacy (3)	
			Availability (4)	
		Ease of Use (5)	Efficiency (8)	
Website Design (5)	Website Functionality (6)	Functionality (4)		
		Vividness (6)		
		Entertainment (5)		

Note: The size of the rectangles shows the conceptual richness (content coverage) of each dimension. The number of items for a dimension is illustrated in parentheses.

Figure 13. Comparison of VEQual with Three Existing Scales.

Relationships with Focal Constructs

To estimate the applicability and practical value of the newly developed VEQual scale, this study conducted a nomological validity test by examining the relationship between the VEQual scale and focal constructs in the context of service and event management. To test the usefulness of this multidimensional VEQual scale within a more parsimonious and interpretable

model, this study adopted a second-order factor model, wherein seven sub-dimensions play the role of indicators of a broader and more comprising second-order VEQual factor (Hair et al., 2006). As depicted in Figure 12, the results of model testing suggest that VEQual can be conceptualized meaningfully using a higher-order model, and these results are consistent with previous studies (Brady & Cronin, 2001; Kang & James, 2004; Nunkoo et al., 2017; Wilkins et al., 2007). In addition, such results confirmed that VEQual is a multidimensional variable in the evaluation of various parameters related to virtual events and is parallel to those assessed by previous scale-development studies dealing with e-service quality (e.g., Bauer et al., 2006; Fassnacht & Koese, 2006; Lu et al., 2009; Parasuraman et al., 2005).

R-square (R^2) measures each endogenous construct's explained variance and thus refers to a measure of the proposed model's explanatory power (Hair et al., 2019). Although acceptable R-square values vary depending on the context, in general, 0.75, 0.50, and 0.25 can be interpreted as substantial, moderate, and weak, respectively (Hair et al., 2019). The overall explanatory power of the proposed research framework in this study had an R-square of 63.3% for revisit intention, 71.2% for social presence, and 77.4% for satisfaction with virtual events, suggesting that the newly developed VEQual scale is capable of explaining a high proportion of variation in extant focal constructs in the event context.

The results of the nomological validity analysis confirmed most of the proposed hypotheses. Building upon the IS success model (Delone & McLean, 2004), this study attempted to examine the relationship between the newly developed VEQual, event consumers' perception (i.e., satisfaction and social presence), and net benefit (i.e., revisit intention) to ensure the nomological validity of the VEQual scale. In line with previous e-service quality studies (Carlson & O'Cass, 2010; Cristobal et al., 2007; Elliot et al., 2013; Ho & Lee, 2007; Jung et al.,

121

2015; Tsang et al., 2010), event attendees' perceived quality (i.e., VEQual) had a significant effect on their satisfaction and revisit intention. This result shows that the developed VEQual measurement scale represents good predictive validity. In addition, the relationship between satisfaction about pre-consumption and behavioral intention for post-consumption has been considerably validated in consumer behavior research across various disciplines (Alalwan, 2020; Bhattacherjee, 2001; Bruwer, 2014). Its revalidation in the context of virtual events enhanced the robustness of this relationship.

Given that event participants' satisfaction and behavioral intentions are formed by various social interactions between various event stakeholders (e.g., attendees, participants, and providers) (Getz, 1997; Getz et al., 2001), this study hypothesized that the level of social presence would play a key role as an antecedent as well as an outcome based on social presence theory. As expected, virtual event attendees' perceived quality, consisting of seven dimensions, had a significant effect on the level of social presence, and these results are consistent with previous social presence studies (Kim et al., 2011; Oh et al., 2018; Wei et al., 2019). Although event attendees participate in a virtual event using only a virtual environment, they are more likely to feel "being together" during the event when they perceive the various dimensions of virtual events (e.g., responsiveness, vividness, entertainment, etc.) as satisfactory. Furthermore, this study's results support the hypothesis regarding the positive effect of event attendees' perceived social presence on satisfaction. This means that the level of perceived social presence is a critical determinant of satisfaction. This is in line with Gunawardena and Zittle's (1997) findings of a significant relationship between perceived social presence and satisfaction in a computer-mediated environment. Unexpectedly, event attendees' perceived social presence did not have a direct relationship with revisit intention, which contradicted the results of the study by

Wei et al. (2019). However, as illustrated in Table 29, social presence indirectly affected revisit intention. These results indicate that the level of social presence in a virtual event is not a direct factor in motivating participants' intention to revisit the event, but it can affect participants' satisfaction and eventually become another important factor in determining their intention to revisit the virtual event.

Theoretical Implications

Despite the growing importance of virtual events, research on their quality and its measurement is scarce. This study provides academia and researchers with a number of theoretical contributions to develop a better understanding of the various phenomena related to virtual events.

First, to the best of our knowledge, this study is one of the first to develop a VEQual instrument and empirically test its usefulness through multiple phases, including qualitative and quantitative approaches. The development of measurements is a crucial activity in behavioral and social sciences, since it may be the first step toward understanding various social and psychological phenomena (DeVellis, 2016). With noticeable practitioner interest and increasing calls for relevant research (Mair & Weber, 2019; Sox et al., 2017), an increasing number of studies on the nature and dynamics of virtual events are expected. Therefore, this study's findings provide a foundation for establishing future knowledge on VEQual. For example, the VEQual scale developed in this study can be used when developing more specific event-context-focused scales (e.g., virtual conferences, virtual races, virtual festivals, etc.) in greater depth. As "e-service quality dimensions tend to be contingent on the service industry involved" (Ladhari, 2010, p.473), dimensions to evaluate service quality can be slightly different depending on the

context. Therefore, this study's results will be a great asset for future studies dealing with various social and psychological phenomena related to virtual events.

This study's findings also contribute to integrating the fragmented nature of event quality research and provide related literature with a comprehensive understanding of the phenomena related to virtual events. As there has not been an appropriate and optimized measurement scale to correctly evaluate event quality in the context of event management, most studies have merely adopted a service quality measurement, and, in turn, there is no general agreement regarding the exact nature or content of event quality dimensions (Wong et al., 2015). By rigorously testing the generated items with data from three different samples across various types of events (e.g., festivals, business, entertainment, and sports events), this study developed a more widely applicable measurement instrument across specific contexts. In line with Fassnacht and Koese's (2006) approach, each item was generated in a rather general way and did not focus on a particular area, such as a festival or business event. Consequently, the developed scale is more likely to be easily applied to any type of event held in virtual environments and is devoted to filling the gap in the current literature.

Finally, the current study offers initial insights into the role of VEQual within a critical nomological relationship, including consumer-perceived "social presence," "virtual event satisfaction," and "revisit intention." Therefore, this study contributes to a cumulative body of research by integrating the newly developed VEQual scale into important existing variables based on two grounded theories: social presence theory and the IS success model. With the increased usage of various virtual communication tools, the concept of social presence and the IS success model have been currently highlighted across disciplines (Bickle et al., 2019; Garrison, 2016; Wang et al., 2018; Wei et al., 2019). This study not only employed social presence theory

and the IS success model in the context of virtual events but also extended the generalizability of these grounded theories in the same context, which is the distinct and significant contribution of this study.

Managerial Implications

In the wake of the COVID-19 pandemic, considerable efforts are being made to rapidly transform traditional in-person events into virtual events that are more innovative and safer. However, the nature of virtual events has not yet been studied sufficiently, and the understanding of this field might be relatively low. In turn, many event managers still face a lot of difficulties in preparing and operating virtual events effectively. The results of this study provide a variety of managerial implications that would be sufficiently helpful for event managers experiencing these challenges.

Currently, most virtual events are events that were previously held in the traditional in-person format. Therefore, many event planners are focusing on how to better implement traditional in-person events in a virtual event venue (e.g., websites, mobile applications, etc.). Of course, there are some similarities, but as found in this study, the criteria for evaluating the performance of virtual events from the customers' perspective are quite different from those implemented for traditional in-person events. For example, virtual event attendees care about whether the imagery (e.g., videos, photos, text, etc.) used in the virtual event is clear or vivid, whether the virtual event provides a stable connection, and whether using a virtual event's platform is uncomplicated; these aspects are totally different from those associated with traditional events. Therefore, event planners or managers should approach virtual events differently.

The results of the literature review and interviews show that the transformation of

traditional into virtual events might not be temporary, and we may live in a "new-normal" event world (Zenker & Kock, 2020). Even if the global pandemic situation gets better and face-to-face events make a comeback, many people will become familiar with the various benefits that virtual events provide, such as convenience and lower cost; thus, the demand for virtual events will not disappear and will rather increase or persist at the current scale. As seen in the e-service market, over time, virtual events can also become a highly competitive market, and virtual event attendees may become more and more demanding and are likely to become less tolerant of poor event performance quality (Fassnacht & Koese, 2006). Therefore, delivering high event quality is essential, and the findings of this study can offer event providers a guide to improving VEQual. To deliver a superior perceived quality of virtual events, event providers must first correctly understand how event attendees perceive and evaluate the performance of a virtual event (Parasuraman et al., 2005). The scale of VEQual can help event managers check the performance of specific domains of virtual events more accurately and propose corresponding improvement strategies more effectively. For example, when developing or selecting a virtual platform to hold an event in virtual places, three key attributes proposed in this study, namely, ease of use, vividness, and functionality, should be considered primarily. Moreover, measurement items such as privacy and security may become an important checklist when planning and implementing a virtual event. Furthermore, even in planning and operating a business event, event managers must deeply think about how entertainment features can be added to the event for attendees' satisfaction and positive behavioral intentions.

Still, much is yet to be explored; the findings of this study suggest that social presence is another important key attribute in determining a virtual event's success. Even when event attendees participate in a virtual event alone using a virtual platform, if they feel that they are

126

with others together in the event, their satisfaction with the event and even their willingness to revisit would increase. Earlier, event planners did not have to pay attention to social presence because such feelings were naturally stimulated at traditional events. However, event planners are required to approach this concept more strategically because in virtual events, the level of social presence can be determined "intentionally." This study empirically confirmed that various VEQual dimensions significantly affect event attendees' perceived social presence. For example, multiple items of responsiveness can be great resources for increasing perceived social presence. If two-way communication is available in the virtual event or if the virtual event provides real-time interaction (e.g., chat), event attendees are more likely to feel social presence during the event.

Limitation and Future Research Directions

The developed scale demonstrates excellent psychometric properties based on the results obtained from a number of reliability and validity examinations. Although this study provides a number of theoretical and practical contributions to the relevant field, as with any study, the limitations should be acknowledged to suggest future research directions. This study was conducted under the unprecedented global pandemic situation, and it has been less than a year since virtual events received much attention in earnest from people. Therefore, this study may have limitations in providing a balanced analysis from a more long-term perspective. Since virtual event attendees' demands and expectations would change over time, future research is recommended to adopt longitudinal design to contribute insights regarding specific VEQual phases by representing focal patterns of change (Hollebeek et al., 2014).

In addition, to follow government regulations regarding COVID-19, multiple data collections, including in-depth interviews and surveys, were conducted online. Therefore, the

results of online interviews can be biased due to various circumstances, such as Internet speed, familiarity with online communication, etc. (Janghorban et al., 2014). In addition, the involvement of a survey sampling company may affect the results of this study. For example, as the company usually collects data from those who are members of the survey company, there might be a nonresponse bias in the collected data. In addition, as mentioned previously, through in-depth data cleaning procedures, most unqualified data were screened out; however, there is still a possibility that high reliability of data was not ensured. Thus, future studies on VEQual must consider these limitations.

As discussed by Tsikriktsis (2002) and Ho and Lee (2007), factors related to cultural differences between regions and nations may influence the validity of VEQual. Although the qualitative data used in this study were collected by focusing more on the Asian perspectives and multiple quantitative data collections were conducted in the US, the external validity of the developed VEQual scale's dimensionality might be an issue. Therefore, future studies should replicate the developed scale and conduct research using a different sample. Moreover, this study adopted a second-order factor model approach rather than a first-order factor model approach when examining the developed VEQual scale's nomological validity to suggest a more parsimonious and interpretable model. Therefore, it would be imperative for future studies to examine the effect of each dimension of the VEQual scale on various outcomes, such as continuance intentions or loyalty toward virtual events.

APPENDIX I

IRB APPROVAL

UNLV Social/Behavioral IRB - Exempt Review
Exempt Notice

DATE: December 23, 2020

TO: HYELIN KIM, PhD
FROM: Office of Research Integrity - Human Subjects

PROTOCOL TITLE: [1693989-2] Measuring Service Quality of Virtual Event: Scale Development
                    and Validation

ACTION: DETERMINATION OF EXEMPT STATUS
EXEMPT DATE: December 23, 2020
REVIEW CATEGORY: Exemption category #2(ii)

Thank you for your submission of Revision materials for this protocol. This memorandum is notification that the protocol referenced above has been reviewed as indicated in Federal regulatory statutes 45CFR46.101(b) and deemed exempt.

We will retain a copy of this correspondence with our records.

PLEASE NOTE:
Upon final determination of exempt status, the research team is responsible for conducting the research as stated in the exempt application reviewed by the ORI - HS and/or the IRB which shall include using the most recently submitted Informed Consent/Assent Forms (Information Sheet) and recruitment materials.

If your project involves paying research participants, it is recommended to contact Carisa Shaffer, ORI Program Coordinator at (702) 895-2794 to ensure compliance with the Policy for Incentives for Human Research Subjects.

Any changes to the application may cause this protocol to require a different level of IRB review. Should any changes need to be made, please submit a **Modification Form**. When the above-referenced protocol has been completed, please submit a **Continuing Review/Progress Completion report** to notify ORI - HS of its closure.

If you have questions, please contact the Office of Research Integrity - Human Subjects at IRB@unlv.edu or call 702-895-2794. Please include your protocol title and IRBNet ID in all correspondence.

Office of Research Integrity - Human Subjects
4505 Maryland Parkway . Box 451047 . Las Vegas, Nevada 89154-1047
(702) 895-2794 . FAX: (702) 895-0805 . IRB@unlv.edu

SEMI-STRUCTURED QESTIONNAIRE FOR EVENT PROVIDERS

Interview Guide for Event Providers

Before starting the interview, I would like to briefly explain the main purpose of this study. The unprecedented pandemic situation (Covid-19) leads to substantial demands and opportunities for a new format of event, a 'virtual event.' A virtual event indicates an event such as festival, conference, or meeting held in a computer-generated virtual environment such as online rather than in physical places at a given time for particular purposes. Although the market of virtual events is expanding considerably and very promising, the nature of virtual events has been understudied, and more importantly, an appropriate instrument to evaluate the performance of virtual events has not been developed. Therefore, this study aims to develop and validate a Virtual Event Quality (VESQ) instrument.

1. Research objective: To find your experiences on virtual event planning

we would like to know more about the virtual events that you've recently planned and coordinated.

- Please tell me the name of the virtual event you recently planned and coordinated.
- What was the purpose of the virtual event? (Why did you plan and organize the virtual event?)
- When was the virtual event held?
- How many days was the event held for?
- How many people would you were participating in the event?
- Which programs or contents did the virtual event provide?
- What language was used for the virtual event?
- Was the virtual event held in a face-to-face physical event format before Covid-19, such as in 2019 or 2018?
    - If yes, can you compare the new virtual event with the traditional (face-to-face) format event in terms of promotion, program, communication, etc.?

We would like to ask you some questions about your satisfaction with the virtual event. In particular, we would like to find out how you prepared and coordinated the virtual event to satisfy your event attendees. Think about your recent experience with a virtual event you've recently planned and coordinated.

- Can you tell me which emotions you tried to trigger from event attendees during the event? (e.g., happy, excited, surprised) To do so, what kind of efforts did you make?

- Can you tell me how you tried to satisfy the event attendees in detail?

- o (Before) What did you plan and prepare to satisfy the event attendees before the virtual event was held?

- o (During) How did you try to satisfy the event attendees during the event?

- o (After) Did you do something to satisfy the event attendees after the event finished?

2. Research objective: To determine more detailed items that consist of virtual event quality measurement.

Would you tell me all of the important attributes of virtual events from the perspective of event providers? (e.g., great design of website, social interaction between provider and attendees, reasonable price, etc.) Why do you think these are important?

More in details, the research team found that a virtual event's quality can be generally evaluated based on three different categories: virtual event environment (system), event content/program, and outcome. The following questions will ask you about what items are needed to evaluate each category appropriately. Think about your recent experience with a virtual event you've recently planned and coordinated.

- Let us talk about virtual event environment quality. The virtual event environment can include appearance (e.g., design, layout, or graphic) and technical function (e.g., navigation or ease of use) of a website or another platform (e.g., mobile application) that the virtual event was held. Was the virtual event held on a website or platform? Can you tell me what efforts you made to ensure the quality of the virtual event venue? (e.g., functions and design)

  - o When you consider the appearance and technical functions of the virtual event website or platform, what aspects do you think important?

- The virtual event can include various event content and experiences such as discussion, performance, exhibition, and videos. In terms of event content and program, what aspects do you think important?

  - o Can you tell me what efforts you made to ensure quality? For example, was it one-way communication or interactive? What efforts did you make to better communicate with virtual event attendees?

- Finally, let us talk about virtual event outcome quality. Outcome quality indicates what event attendees could have or receive, when they left the virtual event. In terms of the outcome of the virtual event, what aspects do you think important? What efforts did you make to ensure quality?

- For example, from the event attendees' perspective, what could be considered proper compensation or benefit for participating in the virtual event?

SEMI-STRUCTURED QUESTIONNAIRE FOR EVENT ATTENDEES

Interview Questions for Event Attendees

Before starting the interview, I would like to briefly explain the main purpose of this study. The unprecedented pandemic situation (Covid-19) leads to substantial demands and opportunities for a new format of event, a 'virtual event.' A virtual event indicates an event such as festival, conference, or meeting held in a computer-generated virtual environment such as online rather than in physical places at a given time for particular purposes. Although the market of virtual events is expanding considerably and very promising, the nature of virtual events has been understudied, and more importantly, an appropriate instrument to evaluate the performance of virtual events has not been developed. Therefore, this study aims to develop and validate a Virtual Event Quality (VEQual) instrument.

1. Research objective: To examine virtual event attendees' behaviors and experiences

Please think about virtual events that you have recently participated in
Firstly, we would like to know more about the virtual events that you've recently attended.

- Please tell me the name of the virtual event you have recently participated in.
- Why did you plan and participate in the virtual event? (What motivated you to attend the virtual event?)
- When was the virtual event held?
- How many days was the event held for?
- Which devices did you use to participate in the virtual event? (Mobile or laptop? Computer- built-in speaker or another speaker?)
- How many people would you guess were participating in the event?
- How long did you stay at the virtual event?
- Where were you when you were participating in the event? (Your home? Office? School?)
- Which programs or contents did the virtual event provide?
- When you were participating in the virtual event, were you alone? Or with others?
- Was the virtual event held in a face-to-face physical event format before Covid-19, such as in 2019 or 2018?
    - If yes, can you compare the new virtual event with the traditional (face-to-face) format event in terms of promotion, program, communication, etc.? What type of event is better? Why?

We would like to ask how satisfied you were with the virtual event. In particular, we would like to find out which qualities and aspects affected your satisfaction or dissatisfaction with the virtual event. Think about your recent experience participating in a virtual event.

- Can you tell me which emotions you felt during the event? (e.g., happy, excited, bored, or embarrassed) Why? What made you feel that way?
- In overall, were you satisfied with the virtual event? How many points would you like to give the virtual event? (1= lowest and 10 = highest)

    - If you were satisfied, please tell me all the details that affected your satisfaction from the beginning to the end of event. For example, when you started to participate in the virtual event using your computer, was the very first website screen satisfactory? Why?
    - If you were not satisfied, please tell me all the details that affected your dissatisfaction from the beginning to the end of event.

2. Research objective: To determine important attributes/components of virtual event quality

Firstly, overall, would you tell me all the important attributes of virtual events from the perspective of event consumers? (e.g., website design, social interaction, or price) Why do you think these are important?

Moreover, the research team found that a virtual event's quality can be generally evaluated based on three different categories: virtual event environment (system), event content/experience, and outcome. The following questions will ask you about what items are needed to evaluate each category appropriately. Think about your recent experience participating in a virtual event.

- Let us talk about virtual event environment quality. The virtual event environment can include appearance (e.g., design, layout, or graphic) and technical function (e.g., navigation or ease of use) of a website or another platform (e.g., mobile application) that the virtual event was held. Can you tell me what the virtual (online) event venue, such as the website or platform, was like?

    - When you consider the appearance and functions of the virtual event website or platform, what aspects do you think important? For example, if you could rate the virtual (online) event venue, what aspects earn positive points, and what aspects cannot? Why? (e.g., functions and design)

- The virtual event provided you with various event content such as discussion, performance, exhibition, and videos. Can you tell me what the event content and program were like? Was it one-way communication or interactive? Which content/experience type did you like the most? Why?

    - In terms of event content and experience, what aspects do you think important? Why? If you could rate the virtual (online) event's program, content and experience, what aspects earn positive points, and what aspects cannot?

- Finally, let us talk about virtual event outcome quality. Outcome quality indicates what you could have or receive, when you left the virtual event. When the event was finished,

how did you feel? For example, you can think about if the event providers' promise was fulfilled through the event or Which benefits you could have by participating in the virtual event. Did you think it was worth attending the virtual event? Why?

- o In terms of the outcome of the virtual event, what aspects do you think important? how did you evaluate the virtual event?

Supplementary question: If you could evaluate the virtual event that you have recently attended, what aspects would you like to evaluate in greater detail?

INFORMED CONSENT FORM

You are invited to participate in a research study. The purpose of this study is to develop and validate a Virtual Event Quality (VEQual) instrument through a meaningful conceptual model. You are being asked to participate in the study because you are over 18 years old. If you volunteer to participate in this study, you will be asked to answer the following questions based on the given survey. There will not be direct benefits to you as a participant in this study. However, your participation will be important to conduct this study and find valuable results. The study will take *5-10* minutes of your time.

This study includes only minimal risks. There are risks involved in all research studies. You may feel uncomfortable when answering some of the questions. You may choose not to answer any question, and may also discontinue participation at any time. There will not be financial cost to you to participate in this study. All information gathered in this study will be kept completely confidential. No reference will be made in written or oral materials that could link you to this study. All records will be stored in a locked facility at UNLV for 3 years after completion of the study. After the storage time the information gathered will be completely discarded. Your participation in this study is voluntary. You may withdraw at any time. You are encouraged to ask questions about this study at the beginning or any time during the research study.

For questions regarding this study you may contact Dr. Hyelin Kim or Sung-Eun Kim at hyelin.kim@unlv.edu, sungeun.kim@unlv.edu. For questions regarding the rights of research subjects, any complaints or comments regarding the manner in which the study is being conducted you may contact the UNLV Office of Research Integrity – Human Subjects at 702-895-2794, toll free at 888-581-2794, or via email at IRB@unlv.edu.

☐ I consent, begin the study
☐ I do not consent. I do not wish to participate

APPENDIX V

FIRST SURVEY QUESTIONNAIRE

(Screening Questions)

Have you attended a **virtual event,** such as a festival, culture event, conference, exhibition, sports event, tradeshow, etc., held in **a virtual platform** (e.g., website, mobile application) over the last 6 months?

- ☐ Yes
- ☐ No

If yes, in which type of **virtual events** have you recently participated?

- ☐ Festival or culture event (commemorations, carnivals, parades, religious rites, etc.)
- ☐ Business event (meetings, conventions, fairs, exhibitions, incentives, etc.)
- ☐ Entertainment event (concerts, shows, award ceremonies, etc.)
- ☐ Sports event (virtual marathon, race, trekking, hiking, etc.)

Please provide the exact name of the **virtual event** in which you recently participated.

_____

We care about the quality of our survey data and hope to receive the most accurate measures of your opinions, so it is important to us that you thoughtfully provide your best answer to each question in the survey. Do you commit to providing your thoughtful and honest answers to the questions in this survey?

- ☐ I will provide my best answers
- ☐ I will not provide my best answers
- ☐ I can't promise either way

* Please recall a virtual event in which you recently participated and answer the following questions based on that event

Your responses to the following questions pertain your perception of **the quality of virtual event** that you recently attended. For the following items, please indicate your level of agreement by checking the option that best describes your thoughts with respect to the item.

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
1. The virtual event was optimized for online (e.g., website, mobile app) viewing.							

2. The virtual event provided high resolution pixel graphics.							
3. The virtual event provided clear video and images.							
4. The imagery (e.g., video, images) used in the virtual event were accurate.							
5. The imagery (e.g., video, images) used in the virtual event were vivid.							
6. All e descriptions (e.g. registration, participation) for the virtual event were easy to read.							
7. Text and image used in the virtual event were always displayed legibly.							
8. Symbols/icons used in the virtual event were readily identifiable.							
9. Pictures/images used in the virtual event were always displayed properly.							
10. The platform (e.g., website, mobile application, etc.) design of the virtual event was aesthetically appealing.							
11. The necessary materials were easy to download (i.e., applications, files).							
12. Sound was clear and did not cut out during the virtual event.							
13. No interruptions interfered with participants' speaking and listening.							
14. The virtual event provided a stable connection.							
15. No errors occurred in the virtual event platform (e.g., website, mobile application, etc.) at any point.							
16. The organization and structure of the virtual event were easy to follow.							
17. The virtual event directed the customer step by step.							
18. Only a few clicks took me where I wanted to go in the virtual event platform.							
19. It did not take much time to learn how to navigate the virtual event's platform							
20. Using the virtual event's platform was not complicated.							
21. Using the virtual event's platform did not requires much effort.							
22. Information provided by the virtual event was accurate.							
23. Information provided by the virtual event was easy to understand.							
24. Information provided by the virtual event was useful.							
25. The virtual event provided up-to-date information.							
26. Pre-informational service kept me well-informed of the event program and schedule.							
27. The content provided by the virtual event was attractive.							
28. The content provided by the virtual event was interesting							
29. The content provided by the virtual event was entertaining							

30. The content provided by the virtual event was not boring							
31. When the event ended, I felt that I had enjoyed it and that it would leave a lasting impression on me.							
32. The virtual event served its purpose very well.							
33. Programs/services of the virtual event were delivered by the time promised.							
34. Programs/services of the virtual event were delivered as promised.							
35. The virtual event provided the desired outcome.							
36. The operating time of the virtual event program was appropriate.							
37. The virtual event program properly reflected the purpose of the event.							
38. Two-way communication was available in the virtual event.							
39. The virtual event provided real-time interaction service (e.g., chat).							
40. If I wanted to, I could easily contact a customer service representative.							
41. The virtual event responded to attendee inquiries promptly.							
42. Help and support were available when problems were encountered.							
43. The virtual event provider demonstrated a willingness to help me.							
44. The virtual event assured me that my personal information will not be shared with other parties.							
45. I felt secure in providing personal information to participate in the event.							
46. I felt the risk associated with event participation was low.							
47. The virtual event protected information about my behavior related to event participation.							
48. The virtual event protected information about my activity during the virtual event.							

(Demographic Questions)

What is your gender?

☐ Male
☐ Female

What is your age?

_____

What is your annual household income?

☐ Less than $50,000
☐ $50,000-$74,999
☐ $75,000-$99,999
☐ $100,000-$149,999
☐ $150,000 or more

What is your employment status?

☐ Employed full time
☐ Employed part time
☐ Unemployed
☐ Retired
☐ Student
☐ Other

What is the highest level of education you received?

☐ High school or less
☐ Some college
☐ Associates' degree, trade/technical school
☐ Bachelor's degree
☐ Graduate degree

What is your marital status?

☐ Single
☐ Married
☐ Divorced/widowed/separated
☐ Other

APPENDIX VI

SECOND SURVEY QUESTIONNAIRE

(Screening Questions)

* Please recall a virtual event in which you recently participated and answer the following questions based on that event. Your responses to the following questions pertain to your perception of the quality of the virtual event that you recently attended.

The following items ask you about the 'vividness' of the virtual event. Please indicate your level of agreement by checking the option that best describes your thoughts with respect to the item.

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
The virtual event was optimized for online (e.g., website, mobile app) viewing.							
The imagery (e.g., video, images) used in the virtual event was accurate.							
The virtual event provided clear video and images.							
The imagery (e.g., video, images) used in the virtual event was vivid.							
Pictures/images used in the virtual event were always displayed properly.							
Text and image used in the virtual event were always displayed legibly.							

The following items ask you about the 'functionality' of the virtual event. Please indicate your level of agreement by checking the option that best describes your thoughts with respect to the item.

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
There were no interruptions during speaking and listening.							
No errors occurred on the platform at any point.							
The virtual event provided a stable connection.							
Sound was clear and did not cut out during the virtual event.							

The following items ask you about the 'ease of use' of the virtual event. Please indicate your level of agreement by checking the option that best describes your thoughts with respect to the item.

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
Using the virtual event's platform was not complicated.							
Using the virtual event's platform did not requires a lot of effort.							
Only a few clicks took me where I want.							
The virtual event directed the customer step by step.							
The organization and structure of the virtual event were easy to follow.							

The following items ask you about the 'responsiveness' of the virtual event. Please indicate your level of agreement by checking the option that best describes your thoughts with respect to the item.

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
Two-way communication was available in the virtual event.							
The virtual event provided real-time interaction service (e.g. chat).							
If I wanted to, I could easily contact a customer service representative.							
The virtual event responded to attendee inquiries promptly.							
The virtual event provider demonstrated its willingness to help me.							
Help and support were available when problems were encountered.							

The following items ask you about the 'entertainment' of the virtual event. Please indicate your level of agreement by checking the option that best describes your thoughts with respect to the item.

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
The contents provided by the virtual event were entertaining.							
The contents provided by the virtual event were not boring.							

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
When the event ended, I felt that I enjoyed it and it left a lasting impression.							
The contents provided by the virtual event were interesting.							
The contents provided by the virtual event were attractive.							

The following items ask you about the 'fulfillment' of the virtual event. Please indicate your level of agreement by checking the option that best describes your thoughts with respect to the item.

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
The operating time of the virtual event programs was appropriate.							
The virtual event program properly reflected the purpose of the event.							
Programs/services of the virtual event were delivered by the time promised.							
Information provided by the virtual event was accurate.							
Programs/services of the virtual event were delivered as promised.							

The following items ask you about the 'privacy/security' of the virtual event. Please indicate your level of agreement by checking the option that best describes your thoughts with respect to the item.

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
The virtual event protected information about my activity during the event.							
The virtual event protected information about my behavior related to event participation.							
The virtual event assured me that my personal information would not be shared with other parties.							
I felt secure in providing personal information for event participation.							

(Demographic Questions)

APPENDIX VII

THIRD SURVEY QUESTIONNAIRE

(Screening Questions)

* Please recall a virtual event in which you recently participated and answer the following questions based on that event. Your responses to the following questions pertain to your perception of the quality of the virtual event that you recently attended.

The following items ask you about the 'vividness' of the virtual event. Please indicate your level of agreement by checking the option that best describes your thoughts with respect to the item.

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
The virtual event was optimized for online (e.g., website, mobile app) viewing.							
The imagery (e.g., video, images) used in the virtual event was accurate.							
The virtual event provided clear video and images.							
The imagery (e.g., video, images) used in the virtual event was vivid.							
Pictures/images used in the virtual event were always displayed properly.							
Text and image used in the virtual event were always displayed legibly.							

The following items ask you about the 'functionality' of the virtual event. Please indicate your level of agreement by checking the option that best describes your thoughts with respect to the item.

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
There were no interruptions during speaking and listening.							
No errors occurred on the platform at any point.							
The virtual event provided a stable connection.							

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
Sound was clear and did not cut out during the virtual event.							

The following items ask you about the 'ease of use' of the virtual event. Please indicate your level of agreement by checking the option that best describes your thoughts with respect to the item.

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
Using the virtual event's platform was not complicated.							
Using the virtual event's platform did not requires a lot of effort.							
Only a few clicks took me where I want.							
The virtual event directed the customer step by step.							
The organization and structure of the virtual event were easy to follow.							

The following items ask you about the 'responsiveness' of the virtual event. Please indicate your level of agreement by checking the option that best describes your thoughts with respect to the item.

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
Two-way communication was available in the virtual event.							
The virtual event provided real-time interaction service (e.g. chat).							
If I wanted to, I could easily contact a customer service representative.							
The virtual event responded to attendee inquiries promptly.							
The virtual event provider demonstrated its willingness to help me.							
Help and support were available when problems were encountered.							

The following items ask you about the 'entertainment' of the virtual event. Please indicate your level of agreement by checking the option that best describes your thoughts with respect to the item.
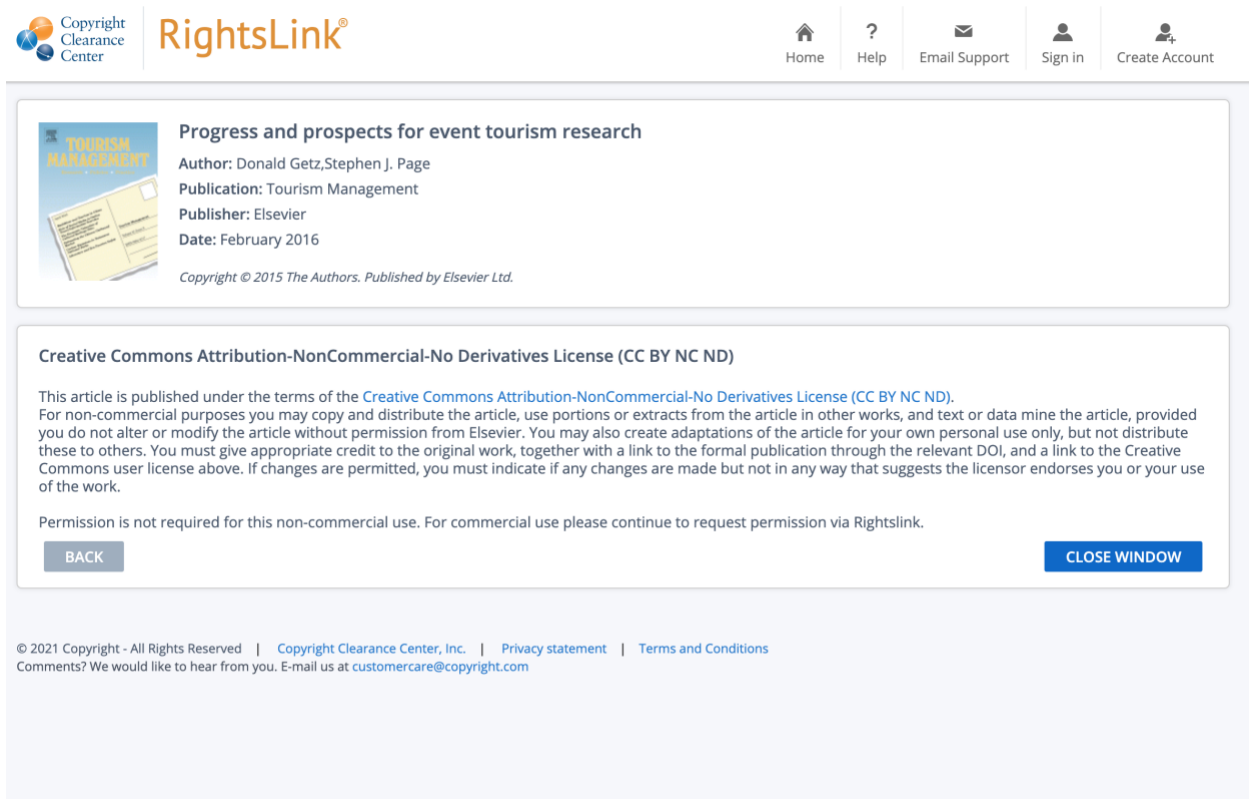
	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
The contents provided by the virtual event were entertaining.							

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
The contents provided by the virtual event were not boring.							
When the event ended, I felt that I enjoyed it and it left a lasting impression.							
The contents provided by the virtual event were interesting.							
The contents provided by the virtual event were attractive.							

The following items ask you about the 'fulfillment' of the virtual event. Please indicate your level of agreement by checking the option that best describes your thoughts with respect to the item.

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
The operating time of the virtual event programs was appropriate.							
The virtual event program properly reflected the purpose of the event.							
Programs/services of the virtual event were delivered by the time promised.							
Information provided by the virtual event was accurate.							
Programs/services of the virtual event were delivered as promised.							

The following items ask you about the 'privacy/security' of the virtual event. Please indicate your level of agreement by checking the option that best describes your thoughts with respect to the item.

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
The virtual event protected information about my activity during the event.							
The virtual event protected information about my behavior related to event participation.							
The virtual event assured me that my personal information would not be shared with other parties.							
I felt secure in providing personal information for event participation.							

Your responses to the following questions pertain to **your perceived presence** and **behavioral intentions** related to the virtual event you recently attended. Please indicate your level of agreement by checking the option that best describes your thoughts with respect to the item.

Your responses to the following questions pertain 'social presence' of the virtual event that you recently attended.

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
There was a sense of human contact in the virtual event.							
There was a sense of sociability in the virtual event.							
There was a sense of human warmth in the virtual event.							
There was a sense of human sensitivity in the virtual event.							

Your responses to the following questions pertain 'revisit intention' of the virtual event you recently attended.

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I intend to revisit the virtual event in the future.							
I plan to revisit the virtual event in the future.							
I desire to visit the virtual event in the future.							
I probably will revisit the virtual event in the future.							

Your responses to the following questions pertain to 'overall satisfaction' with the virtual event that you recently attended.

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I am satisfied with my decision to participate in the virtual event.							
The virtual event did a good job of satisfying my needs.							
I am satisfied with the experience in the virtual event.							

(Demographic Questions)

APPENDIX VIII

COPYRIGHT LICENSES FOR FIGURES

Figure 1:

Figure 2:

Figure 3:

Servicescapes: The Impact of Physical Surroundings on Customers and Employees

Author: Mary Jo Bitner
Publication: Journal of Marketing
Publisher: SAGE Publications
Date: 04/01/1992

Copyright © 1992, © SAGE Publications

Gratis Reuse

Permission is granted at no cost for use of content in a Master's Thesis and/or Doctoral Dissertation, subject to the following limitations. You may use a single excerpt or up to 3 figures tables. If you use more than those limits, or intend to distribute or sell your Master's Thesis/Doctoral Dissertation to the general public through print or website publication, please return to the previous page and select 'Republish in a Book/Journal' or 'Post on intranet/password-protected website' to complete your request.

BACK   CLOSE WINDOW

Figure 4:

Thank you for your order!

Dear Mr. Sungeun Kim,

Thank you for placing your order through Copyright Clearance Center's RightsLink® service.

Order Summary

Licensee:	Mr. Sungeun Kim
Order Date:	Apr 6, 2021
Order Number:	5043070824053
Publication:	Managing Service Quality
Title:	E-service quality: a model of virtual service quality dimensions
Type of Use:	Dissertation/Thesis
Order Total:	0.00 USD

(Original Order Number: 501645184)

View or print complete details of your order and the publisher's terms and conditions.

Sincerely,

Copyright Clearance Center

Figure 5 & 7:

REFERENCES

Adema, K. L., & Roehl, W. S. (2010). Environmental scanning the future of event design. *International Journal of Hospitality Management*, 29(2), 199-207.

Aladwani, A. M., & Palvia, P. C. (2002). Developing and validating an instrument for measuring user-perceived web quality. *Information & management*, *39*(6), 467-476.

Alalwan, A. A. (2020). Mobile food ordering apps: An empirical study of the factors affecting customer e-satisfaction and continued intention to reuse. *International Journal of Information Management*, *50*, 28-44.

Albacete-Saez, C. A., Fuentes-Fuentes, M. M., & Lloréns-Montes, F. J. (2007). Service quality measurement in rural accommodation. *Annals of Tourism Research*, *34*(1), 45-65.

Alexandris, K., Theodorakis, N., Kaplanidou, K. and Papadimitriou, D. (2017), "Event quality and loyalty among runners with different running involvement levels: The case of "The Alexander the Great" International Marathon", *International Journal of Event and Festival Management*, Vol. 8 No. 3, pp. 292-307.

Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological bulletin*, *103*(3), 411.

Andersson, T. D., Armbrecht, J., & Lundberg, E. (2017). Linking event quality to economic impact: A study of quality, satisfaction, use value and expenditure at a music festival. *Journal of Vacation Marketing*, 23(2), 114-132.

Argyle, M., & Dean, J. (1965). Eye-contact, distance and affiliation. *Sociometry*, 289-304.

Armstrong, J. S., & Overton, T. S. (1977). Estimating nonresponse bias in mail surveys. *Journal of marketing research*, *14*(3), 396-402.

Arvey, R. D. (2009). Why face-to-face business meetings matter. *White Paper for the Hilton Group*.

Babin, B. J., Darden, W. R., & Griffin, M. (1994). Work and/or fun: measuring hedonic and utilitarian shopping value. *Journal of consumer research*, 20(4), 644-656.

Bagozzi, R. P., & Yi, Y. (1988). On the evaluation of structural equation models. *Journal of the academy of marketing science*, *16*(1), 74-94.

Baker, D. A., & Crompton, J. L. (2000). Quality, satisfaction and behavioral intentions. *Annals of tourism research*, 27(3), 785-804.

Balaji, M. S., & Chakraborti, R. (2015). Stadium atmosphere: scale development and validation in Indian context. *Journal of Indian Business Research*.

Barbera, E. (2004). Quality in virtual education environments. *British Journal of Educational Technology*, 35(1), 13-20.

Barrera, R. B., García, A. N., & Moreno, M. R. (2014). Evaluation of the e-service quality in service encounters with incidents: Differences according to the socio-demographic profile of the online consumer. *Revista Europea de Dirección y Economía de la Empresa*, *23*(4), 184-193.

Bauer, H. H., Falk, T., & Hammerschmidt, M. (2006). eTransQual: A transaction process-based approach for capturing service quality in online shopping. *Journal of Business Research*, *59*(7), 866-875.

Bearden, W. O., Hardesty, D. M., & Rose, R. L. (2001). Consumer self-confidence: Refinements in conceptualization and measurement. *Journal of consumer research*, *28*(1), 121-134.

Bengtsson, M., Boter, H., & Vanyushyn, V. (2007). Integrating the internet and marketing operations: A study of antecedents in firms of different size. *International Small Business Journal*, *25*(1), 27-48.

Bentler, P. M., & Chou, C. P. (1987). Practical issues in structural modeling. *Sociological*

methods & research, *16*(1), 78-117.

Bhattacherjee, A. (2001). Understanding information systems continuance: An expectation-confirmation model. *MIS quarterly*, 351-370.

Bickle, J. T., Hirudayaraj, M., & Doyle, A. (2019). Social presence theory: Relevance for HRD/VHRD research and practice. *Advances in Developing Human Resources*, *21*(3), 383-399.

Biocca, F., & Harms, C. (2002). Defining and measuring social presence: Contribution to the networked minds theory and measure. *Proceedings of PRESENCE*, *2002*, 1-36.

Biocca, F., Harms, C., & Burgoon, J. K. (2003). Toward a more robust theory and measure of social presence: Review and suggested criteria. *Presence: Teleoperators & virtual environments*, 12(5), 456-480.

Bitner, M. J. (1992). Servicescapes: The impact of physical surroundings on customers and employees. *Journal of marketing*, *56*(2), 57-71.

Boateng, G. O., Neilands, T. B., Frongillo, E. A., Melgar-Quiñonez, H. R., & Young, S. L. (2018). Best practices for developing and validating scales for health, social, and behavioral research: a primer. Frontiers in public health, 6, 149.

Bolton, R. N., & Drew, J. H. (1991). A multistage model of customers' assessments of service quality and value. *Journal of consumer research*, *17*(4), 375-384.

Boyer, K. K., Hallowell, R., & Roth, A. V. (2002). E-services: operating strategy—a case study and a method for analyzing operational benefits. *Journal of Operations management*, *20*(2), 175-188.

Brady, M. K., & Cronin Jr, J. J. (2001). Some new thoughts on conceptualizing perceived service quality: a hierarchical approach. *Journal of marketing*, *65*(3), 34-49.

Bruwer, J. (2014). Service quality perception and satisfaction: Buying behaviour prediction in an

    Australian Festivalscape. *International Journal of Tourism Research*, *16*(1), 76-86.

Burmeister, E., & Aitken, L. M. (2012). Sample size: How many is enough?. *Australian Critical*

    Care, *25*(4), 271-274.

Byrne, B. M. (2001). Structural equation modeling with AMOS, EQS, and LISREL:

    Comparative approaches to testing for the factorial validity of a measuring

    instrument. *International journal of testing*, *1*(1), 55-86.

Cai, S., & Jun, M. (2003). Internet users' perceptions of online service quality: a comparison of

    online buyers and information searchers. *Managing Service Quality: An International*

    Journal.

Carlson, J., & O'Cass, A. (2010). Exploring the relationships between e-service quality,

    satisfaction, attitudes and behaviours in content-driven e-service web sites. *Journal of*

    services marketing.

Carlson, J., & O'Cass, A. (2011). Developing a framework for understanding e-service quality,

    its antecedents, consequences, and mediators. *Managing Service Quality: An International*

    Journal.

Carman, J. M. (1990). Consumer perceptions of service quality: an assessment of T. *Journal of*

    retailing, *66*(1), 33.

Carneiro, M. J., Eusébio, C., Caldeira, A., & Santos, A. C. (2019). The influence of eventscape

    on emotions, satisfaction and loyalty: The case of re-enactment events. *International*

    Journal of Hospitality Management, *82*, 112-124.

Caro, L. M., & García, J. A. M. (2007). Measuring perceived service quality in urgent transport

    service. *Journal of Retailing and Consumer Services*, *14*(1), 60-72.

Caro, L. M., & Garcia, J. A. M. (2008). Developing a multidimensional and hierarchical service quality model for the travel agency industry. *Tourism Management*, *29*(4), 706-720.

Cenfetelli, R. T., Benbasat, I., & Al-Natour, S. (2008). Addressing the what and how of online services: Positioning supporting-services functionality and service quality for business-to-consumer success. *Information systems research*, *19*(2), 161-181.

Chen, C. (2013). *Information visualisation and virtual environments*. Springer Science & Business Media.

Chen, G., & Huang, S. S. (2017). Toward a theory of backpacker personal development: Cross-cultural validation of the BPD scale. *Tourism Management*, 59, 630-639.

Chen, Q., & Wells, W. D. (1999). Attitude toward the site. *Journal of advertising research*, *39*(5), 27-38.

Chin, W. W. (1998). The partial least squares approach to structural equation modeling. *Modern methods for business research*, *295*(2), 295-336.

Choo, H., Ahn, K., & Petrick, J. F. (2016). An integrated model of festival revisit intentions. *International journal of contemporary hospitality management*.

Chung, N., Han, H., & Joun, Y. (2015). Tourists' intention to visit a destination: The role of augmented reality (AR) application for a heritage site. *Computers in Human Behavior*, *50*, 588-599.

Churchill Jr, G. A. (1979). A paradigm for developing better measures of marketing constructs. *Journal of marketing research*, 16(1), 64-73.

Cole, S. T., & Illum, S. F. (2006). Examining the mediating role of festival visitors' satisfaction in the relationship between service quality and behavioral intentions. *Journal of Vacation Marketing*, 12(2), 160-173.

Collier, J. E., & Bienstock, C. C. (2006). Measuring service quality in e-retailing. *Journal of service research*, *8*(3), 260-275.

Collier, J. E., & Bienstock, C. C. (2009). Model misspecification: contrasting formative and reflective indicators for a model of e-service quality. *Journal of Marketing Theory and Practice*, *17*(3), 283-293.

Coyle, J. R., & Thorson, E. (2001). The effects of progressive levels of interactivity and vividness in web marketing sites. *Journal of advertising*, *30*(3), 65-77.

Cristobal, E., Flavian, C., & Guinaliu, M. (2007). Perceived e-service quality (PeSQ). *Managing service quality: An international journal*. 17(3), 317-34.

Crompton, J. L., & Love, L. L. (1995). The predictive validity of alternative approaches to evaluating quality of a festival. *Journal of travel research*, 34(1), 11-24.

Cronbach, L. J., & Meehl, P. E. (1955). Construct validity in psychological tests. *Psychological bulletin*, *52*(4), 281.

Cronin Jr, J. J., & Taylor, S. A. (1994). SERVPERF versus SERVQUAL: reconciling performance-based and perceptions-minus-expectations measurement of service quality. *Journal of marketing*, *58*(1), 125-131.

Cui, G., Lockee, B., & Meng, C. (2013). Building modern online social presence: A review of social presence theory and its instructional design implications for future trends. *Education and information technologies*, *18*(4), 661-685.

Cyr, D., Hassanein, K., Head, M., & Ivanov, A. (2007). The role of social presence in establishing loyalty in e-service environments. *Interacting with computers*, *19*(1), 43-56.

Dabholkar, P. A., Shepherd, C. D., & Thorpe, D. I. (2000). A comprehensive framework for service quality: an investigation of critical conceptual and measurement issues through a

longitudinal study. *Journal of retailing*, *76*(2), 139-173.

Dagger, T. S., Sweeney, J. C., & Johnson, L. W. (2007). A hierarchical model of health service quality: scale development and investigation of an integrated model. *Journal of service research*, *10*(2), 123-142.

Dahlström, P., & Edelman, D. (2013). The coming era of 'on-demand' marketing.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS quarterly*, 319-340.

Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: A comparison of two theoretical models. *Management science*, *35*(8), 982-1003.

DeLone, W. H., & McLean, E. R. (1992). Information systems success: The quest for the dependent variable. *Information systems research*, *3*(1), 60-95.

DeLone, W. H., & McLean, E. R. (2004). The DeLone and McLean model of information systems success: a ten-year update. *Journal of management information systems*, *19*(4), 9-30.

DeVellis, R. F. (2016). *Scale development: Theory and applications* (Vol. 26). Sage publications.

Diallo, M. F., & Seck, A. M. (2018). How store service quality affects attitude toward store brands in emerging countries: Effects of brand cues and the cultural context. *Journal of Business Research*, *86*, 311-320.

Ding, D. X., Hu, P. J. H., & Sheng, O. R. L. (2011). e-SELFQUAL: A scale for measuring online self-service quality. *Journal of Business Research*, *64*(5), 508-515.

Edwards, R., & Holland, J. (2013). *What is qualitative interviewing?*. A&C Black.

Elliot, S., Li, G., & Choi, C. (2013). Understanding service quality in a virtual travel community

environment. *Journal of Business Research*, *66*(8), 1153-1160.

Elliott, M. T., & Speck, P. S. (2005). Factors that affect attitude toward a retail web site. *Journal of Marketing Theory and Practice*, *13*(1), 40-51.

Fassnacht, M., & Koese, I. (2006). Quality of electronic services: conceptualizing and testing a hierarchical model. *Journal of service research*, *9*(1), 19-37.

Fick, G. R., & Brent Ritchie, J. R. (1991). Measuring service quality in the travel and tourism industry. *Journal of travel research*, *30*(2), 2-9.

Flowers, A. A., & Gregson, K. (2012). Decision-making factors in selecting virtual worlds for events: Advocacy, computer efficacy, perceived risks, and collaborative benefits. *Event Management*, *16*(4), 319-334.

Floyd, F. J., & Widaman, K. F. (1995). Factor analysis in the development and refinement of clinical assessment instruments. *Psychological assessment*, *7*(3), 286.

Forbes. (2020). Virtual Events Up 1000% Since COVID-19, With 52,000 On Just One Platform. Available at: https://www.forbes.com/sites/johnkoetsier/2020/05/27/virtual-events-up-1000-with-52000-on-just-one-platform/?sh=19372b2c7a23

Fornell, C., & Larcker, D. F. (1981). Structural equation models with unobservable variables and measurement error: Algebra and statistics.

Friedenberg, L. (1995). *Psychological testing: Design, analysis, and use*. Allyn and Bacon.

Fu Tsang, N. K., Lai, M. T., & Law, R. (2010). Measuring e-service quality for online travel agencies. *Journal of Travel & Tourism Marketing*, *27*(3), 306-323.

Gabbert, F., Hope, L., & Fisher, R. P. (2009). Protecting eyewitness evidence: Examining the efficacy of a self-administered interview tool. *Law and human behavior*, *33*(4), 298-307.

Gannon, M., Taheri, B., & Olya, H. (2019). Festival quality, self-connection, and

bragging. *Annals of Tourism Research*, *76*, 239-252.

Gao, L., Bai, X., & Park, A. (2017). Understanding sustained participation in virtual travel communities from the perspectives of is success model and flow theory. *Journal of Hospitality & Tourism Research*, *41*(4), 475-509.

Garrison, D. R. (2016). *E-learning in the 21st century (3ʳᵈ ed.)*. New York, NY: Routledge.

Gefen, D., & Straub, D. (2003). Managing user trust in B2C e-services. *e-Service*, *2*(2), 7-24.

Geigenmüller, A. (2010). The role of virtual trade fairs in relationship value creation. *Journal of Business & Industrial Marketing*.

Getz, D. (2007). Event Studies: Theory, research and policy for planned events. Oxford, United Kingdom: Elsevier.

Getz, D. (2008). Event tourism: Definition, evolution, and research. *Tourism management*, 29(3), 403-428.

Getz, D., & Page, S. J. (2016). Event studies: Theory, research and policy for planned events. Routledge.

Getz, D., O'Neill, M., & Carlsen, J. (2001). Service quality evaluation at events through service mapping. *Journal of travel research*, 39(4), 380-390.

Gössling, S., Scott, D., & Hall, C. M. (2020). Pandemics, tourism and global change: a rapid assessment of COVID-19. *Journal of Sustainable Tourism*, 1-20.

Gottlieb, U. R., Brown, M. R., & Drennan, J. (2011). The influence of service quality and trade show effectiveness on post-show purchase intention. *European Journal of Marketing*.

Gottlieb, U., & Bianchi, C. (2017). Virtual trade shows: Exhibitors' perspectives on virtual marketing capability requirements. *Electronic Commerce Research and Applications*, 21, 17-26.

Gounaris, S., Dimitriadis, S., & Stathakopoulos, V. (2005). Antecedents of perceived quality in

    the context of Internet retail stores. *Journal of Marketing Manage*ment, 21(7-8), 669-700.

Grand View Research (2020). Virtual Events Market Size, Share & Trends Analysis Report By

    Event Type (Internal, External, Extended), By Service, By Establishment Size, By End Use,

    By Region, And Segment Forecasts, 2020 – 2027, available at:

    https://www.grandviewresearch.com/industry-analysis/virtual-events-market/toc

Grönroos, C. (1982). An applied service marketing theory. *European journal of marketing*.

Gu, J. C., Lee, S. C., & Suh, Y. H. (2009). Determinants of behavioral intention to mobile

    banking. *Expert Systems with Applications*, *36*(9), 11605-11616.

Gunawardena, C. N., & Zittle, F. J. (1997). Social presence as a predictor of satisfaction within a

    computer-mediated conferencing environment. *American journal of distance

    education*, 11(3), 8-26.

Gursoy, D., Spangenberg, E. R., & Rutherford, D. G. (2006). The hedonic and utilitarian

    dimensions of attendees' attitudes toward festivals. *Journal of Hospitality & Tourism

    Research*, *30*(3), 279-294.

Gwinner, K. (1997). A model of image creation and image transfer in event

    sponsorship. *International marketing review*. 14(3), 145-158.

Hahn, S. E., Sparks, B., Wilkins, H., & Jin, X. (2017). E-service quality management of a hotel

    website: A scale and implications for management. *Journal of Hospitality Marketing &

    Management*, *26*(7), 694-716.

Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2009). *Análise

    multivariada de dados*. Bookman editora.

Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2006). Multivariate

data analysis (Vol. 6): Pearson Prentice Hall Upper Saddle River.

Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: Indeed a silver bullet. *Journal of Marketing theory and Practice*, *19*(2), 139-152.

Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European business review*. 31(1), 2-24.

Halawi, L., & McCarthy, R. (2006). Which theory applies: An analysis of information systems research. *Issues in information systems*, *7*(2), 252.

Hammoud, J., Bizri, R. M., & El Baba, I. (2018). The Impact of E-Banking Service Quality on Customer Satisfaction: Evidence From the Lebanese Banking Sector. *SAGE Open*.

Heeter, C. (1992). Being there: The subjective experience of presence. *Presence: Teleoperators & Virtual Environments*, *1*(2), 262-271.

Hinkin, T. R. (1995). A review of scale development practices in the study of organizations. Journal of management, 21(5), 967-988.

Ho, C. I., & Lee, Y. L. (2007). The development of an e-travel service quality scale. *Tourism management*, *28*(6), 1434-1449.

Hollebeek, L. D., Glynn, M. S., & Brodie, R. J. (2014). Consumer brand engagement in social media: Conceptualization, scale development and validation. *Journal of interactive marketing*, *28*(2), 149-165.

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural equation modeling: a multidisciplinary journal*, *6*(1), 1-55.

Hume, M., & Mort, G. S. (2010). The consequence of appraisal emotion, service quality, perceived value and customer satisfaction on repurchase intent in the performing

arts. *Journal of Services Marketing*.

Ibrahim, E. E., Joseph, M., & Ibeh, K. I. (2006). Customers' perception of electronic service

delivery in the UK retail banking sector. *International Journal of Bank Marketing*.

Jang, W., Byon, K. K., & Yim, B. H. (2020). Sportscape, emotion, and behavioral intention: a

case of the big four US-based major sport leagues. *European Sport Management*

Quarterly, *20*(3), 321-343.

Janghorban, R., Roudsari, R. L., & Taghipour, A. (2014). Skype interviewing: The new

generation of online synchronous interview in qualitative research. *International journal of*

qualitative studies on health and well-being, *9*(1), 24152.

Janita, M. S., & Miranda, F. J. (2013). Exploring service quality dimensions in b2b e-

marketplaces. *Journal of Electronic Commerce Research*, *14*(4).

Jin, N., Lee, H., & Lee, S. (2013). Event quality, perceived value, destination image, and

behavioral intention of sports events: The case of the IAAF World Championship, Daegu,

2011. *Asia Pacific Journal of Tourism Research*, 18(8), 849-864.

Jung, T., Chung, N., & Leue, M. C. (2015). The determinants of recommendations to use

augmented reality technologies: The case of a Korean theme park. *Tourism*

management, *49*, 75-86.

Kandampully, J., & Solnet, D. (2015). *Service management principles: For hospitality and*

tourism. Kendall Hunt.

Kang, G. D., & James, J. (2004). Service quality dimensions: an examination of Grönroos's

service quality model. *Managing Service Quality: An International Journal*. 14(4), 266-277.

Karatepe, O. M., Yavas, U., & Babakus, E. (2005). Measuring service quality of banks: Scale

development and validation. *Journal of Retailing and Consumer Services*, *12*(5), 373-383.

Kaur, B., Kaur, J., Pandey, S. K., & Joshi, S. (2020). E-service Quality: Development and Validation of the Scale. *Global Business Review*, 0972150920920452.

Kaynama, S. A., & Black, C. I. (2000). A proposal to assess the service quality of online travel agencies: an exploratory study. *Journal of professional services marketing*, *21*(1), 63-88.

Kelley, S.W. and Turley, L.W. (2001), "Consumer perceptions of service quality attributes at sporting events", Journal of Business Research, Vol. 54 No. 2, pp. 161-6.

Kettinger, W. J., & Lee, C. C. (1994). Perceived service quality and user satisfaction with the information services function. *Decision sciences*, *25*(5-6), 737-766.

Kim, H. C., & Hyun, M. Y. (2016). Predicting the use of smartphone-based Augmented Reality (AR): Does telepresence really help?. *Computers in Human Behavior*, *59*, 28-38.

Kim, J. H., Ritchie, J., & McCormick, B. (2010). Development of a scale to measure memorable tourism experiences. Journal of Travel Research, 49(4), 1-14.

Kim, J., Jin, B., & Swinney, J. L. (2009). The role of etail quality, e-satisfaction and e-trust in online loyalty development process. *Journal of retailing and Consumer services*, 16(4), 239-247.

Kim, J., Kwon, Y., & Cho, D. (2011). Investigating factors that influence social presence and learning outcomes in distance higher education. *Computers & Education*, *57*(2), 1512-1520.

Kim, M. J., Lee, C. K., & Jung, T. (2020). Exploring consumer behavior in virtual reality tourism using an extended stimulus-organism-response model. *Journal of Travel Research*, *59*(1), 69-89.

Kim, M. J., Lee, C. K., & Jung, T. (2020). Exploring consumer behavior in virtual reality tourism using an extended stimulus-organism-response model. *Journal of Travel Research*, *59*(1), 69-89.

Kim, S., & Stoel, L. (2004). Dimensional hierarchy of retail website quality. *Information & management*, *41*(5), 619-633.

Kim, S., Sung, J., Park, J., & Dittmore, S. W. (2015). The relationship among leisure attitude, satisfaction, and psychological well-being for college students. *Journal of Physical Education and Sport*, *15*(1), 70.

Kim, Y. G., Suh, B. W., & Eves, A. (2010). The relationships between food-related personality traits, satisfaction, and loyalty among visitors attending food events and festivals. *International journal of hospitality management*, *29*(2), 216-226.

Kim, Y. H., Kim, M., Ruetzler, T., & Taylor, J. (2010). An examination of festival attendees' behavior using SEM. *International journal of event and festival management*.

Ko, Y. J., Zhang, J., Cattani, K., & Pastore, D. (2011). Assessment of event quality in major spectator sports. *Managing Service Quality*, 21(3), 304-322.

Ko, Y.J. and Pastore, D.L. (2004), "Current issues and conceptualizations of service quality in the recreational sport industry", *Sport Marketing Quarterly*, Vol. 13 No. 3, pp. 159-67.

Kock, F., Josiassen, A., & Assaf, A. G. (2019). Scale development in tourism research: Advocating for a new paradigm. *Journal of Travel Research*, 58(7), 1227-1229.

Koufteros, X., Babbar, S., & Kaighobadi, M. (2009). A paradigm for examining second-order factor models employing structural equation modeling. *International Journal of Production Economics*, *120*(2), 633-652.

Kozinets, R. V. (2002). The field behind the screen: Using the method of netnography to research market-oriented virtual communities. *Journal of Consumer research*, 39(1), 61-72.

Ladhari, R. (2008). Alternative measures of service quality: a review. *Managing Service Quality: An International Journal*. 18(1), 65-86.

166

Ladhari, R. (2010). Developing e-service quality scales: A literature review. *Journal of Retailing and Consumer Services*, *17*(6), 464-477.

Lee, G. G., & Lin, H. F. (2005). Customer perceptions of e-service quality in online shopping. *International Journal of Retail & Distribution Management*. 33(2), 161-176

Lee, J. S., Lee, C. K., & Yoon, Y. (2009). Investigating differences in antecedents to value between first-time and repeat festival-goers. *Journal of Travel & Tourism Marketing*, *26*(7), 688-702.

Lee, K. M., Jung, Y., Kim, J., & Kim, S. R. (2006). Are physically embodied social agents better than disembodied social agents?: The effects of physical embodiment, tactile interaction, and people's loneliness in human–robot interaction. *International journal of human-computer studies*, 64(10), 962-973.

Lee, M., Lee, S. A., Jeong, M., & Oh, H. (2020). Quality of virtual reality and its impacts on behavioral intention. *International Journal of Hospitality Management*, *90*, 102595.

Lee, T. H., & Chang, P. S. (2017). Examining the relationships among festivalscape, experiences, and identity: evidence from two Taiwanese aboriginal festivals. *Leisure studies*, *36*(4), 453-467.

Lee, W., Sung, H., Suh, E., & Zhao, J. (2017). The effects of festival attendees' experiential values and satisfaction on re-visit intention to the destination The case of a food and wine festival. *International Journal of Contemporary Hospitality Management*, 29(3), 1005–1027.

Lee, Y. K., Lee, C. K., Lee, S. K., & Babin, B. J. (2008). Festivalscapes and patrons' emotions, satisfaction, and loyalty. *Journal of business research*, *61*(1), 56-64.

Levy, S. (2014). Does usage level of online services matter to customers' bank loyalty?. *Journal*

of Services Marketing.

Li, Y. N., Tan, K. C., & Xie, M. (2002). Measuring web-based service quality. *Total quality management*, *13*(5), 685-700.

Liu, C., & Arnett, K. P. (2000). Exploring the factors associated with Web site success in the context of electronic commerce. *Information & management*, *38*(1), 23-33.

Llosa, S., Chandon, J. L., & Orsingher, C. (1998). An empirical study of SERVQUAL's dimensionality. *Service Industries Journal*, *18*(2), 16-44.

Loevinger, J. (1957). Objective tests as instruments of psychological theory. *Psychological reports*, *3*(3), 635-694.

Loiacono, E. T., Watson, R. T., & Goodhue, D. L. (2002). WebQual: A measure of website quality. *Marketing theory and applications*, *13*(3), 432-438.

Long, M., & McMellon, C. (2004). Exploring the determinants of retail service quality on the Internet. *Journal of services marketing*. 18(1), 78-90.

Loureiro, S. M. C., Guerreiro, J., Eloy, S., Langaro, D., & Panchapakesan, P. (2019). Understanding the use of Virtual Reality in Marketing: A text mining-based review. *Journal of Business Research*, 100, 514-530.

Lu, Y., Zhang, L., & Wang, B. (2009). A multidimensional and hierarchical model of mobile service quality. *Electronic Commerce Research and Applications*, *8*(5), 228-240.

Madu, C. N., & Madu, A. A. (2002). Dimensions of e-quality. *International Journal of Quality & reliability management*.

Mair, J. and Weber, K. (2019), "Event and festival research: a review and research directions", *International Journal of Event and Festival Management*, Vol. 10 No. 3, pp. 209-216.

Marsh, H. W. (1991). Multidimensional students' evaluations of teaching effectiveness: A test of

alternative higher-order structures. *Journal of Educational Psychology*, *83*(2), 285.

Marsh, H. W., & Bailey, M. (1991). Confirmatory factor analyses of multitrait-multimethod data: A comparison of alternative models. *Applied psychological measurement*, *15*(1), 47-70.

Meetingtoday.com (2012). Virtual Event Definitions avaiable at: https://www.meetingstoday.com/magazines/article-details/articleid/19191/title/virtual-event-definitions

Mei, A. W. O., Dean, A. M., & White, C. J. (1999). Analysing service quality in the hospitality industry. *Managing Service Quality: An International Journal*. 9(2), 136-143.

Moon, K. S., Kim, M., Ko, Y. J., Connaughton, D. P., & Lee, J. H. (2011). The influence of consumer's event quality perception on destination image. *Managing Service Quality: An International Journal*, 21(3), 287-303.

Myers, B. L., Kappelman, L. A., & Prybutok, V. R. (1997). A comprehensive model for assessing the quality and productivity of the information systems function: toward a theory for information systems assessment. *Information Resources Management Journal (IRMJ)*, *10*(1), 6-26.

Narayan, B., Rajendran, C., & Sai, L. P. (2008). Scales to measure and benchmark service quality in tourism industry. *Benchmarking: An International Journal*. 15(4), 469-493.

Nayyar, A., Mahapatra, B., Le, D., & Suseendran, G. (2018). Virtual Reality (VR) & Augmented Reality (AR) technologies for tourism and hospitality industry. *International Journal of Engineering & Technology*, *7*(2.21), 156-160.

Nisbett, R. E., & Ross, L. (1980). Human inference: Strategies and shortcomings of social judgment.

Nikou, S. A., & Economides, A. A. (2017). Mobile-based assessment: Investigating the factors that influence behavioral intention to use. Computers & Education, 109, 56-73.

Nunally, J. C., & Bernstein, I. H. (1978). Psychometric testing. New York: McGraw.

Nunkoo, R., Teeroovengadum, V., Thomas, P., & Leonard, L. (2017). Integrating service quality as a second-order factor in a customer satisfaction and loyalty model. International Journal of Contemporary Hospitality Management.

Nunnally, J. C., & Bernstein, I. H. (1994). Psychometric theory.

O'Neill, M., Getz, D., & Carlsen, J. (1999). Evaluation of service quality at events: the 1998 Coca-Cola Masters Surfing event at Margaret River, Western Australia. Managing Service Quality: An International Journal. 9(3), 158-166.

Oh, C. S., Bailenson, J. N., & Welch, G. F. (2018). A systematic review of social presence: Definition, antecedents, and implications. Frontiers in Robotics and AI, 5, 114.

Oh, H., & Kim, K. (2017). Customer satisfaction, service quality, and customer value: years 2000-2015. *International Journal of Contemporary Hospitality Management*.

Oliver, R. L. (1980). A cognitive model of the antecedents and consequences of satisfaction decisions. *Journal of marketing research*, *17*(4), 460-469.

Osei-Frimpong, K., & McLean, G. (2018). Examining online social brand engagement: A social presence theory perspective. *Technological Forecasting and Social Change*, *128*, 10-21.

Parasuraman, A., Zeithaml, V. A., & Berry, L. (1988). SERVQUAL: A multiple-item scale for measuring consumer perceptions of service quality. *1988*, *64*(1), 12-40.

Parasuraman, A., Zeithaml, V. A., & Malhotra, A. (2005). ES-QUAL: A multiple-item scale for assessing electronic service quality. *Journal of service research*, *7*(3), 213-233.

Parasuraman, A., Zeithaml, V.A. and Berry, L.L. (1985), "A conceptual model of service quality

and its implications of future research", *Journal of Marketing*, Vol. 49 No. 4, pp. 41-50.

Park, S. B., & Park, K. (2017). Thematic trends in event management research. International *Journal of Contemporary Hospitality Management*, 29(3), 848-861.

Park, S. Y. (2009). An analysis of the technology acceptance model in understanding university students' behavioral intention to use e-learning. *Journal of Educational Technology & Society*, *12*(3), 150-162.

Pearlman, D. M., & Gates, N. A. (2010). Hosting Business Meetings and Special Events in Virtual Worlds: A Fad or the Future?. *Journal of Convention & Event Tourism,* 11(4), 247-265.

Podsakoff, P. M., & Todor, W. D. (1985). Relationships between leader reward and punishment behavior and group processes and productivity. *Journal of Management*, *11*(1), 55-73.

Professional Convention Management (2020). How is COVID-19 changing the business events industry? Available at: https://www.pcma.org/wp-content/uploads/2020/04/pcma-convene-covid19-survey-p5d3.pdf

Rihova, I., Buhalis, D., Gouthro, M. B., & Moital, M. (2018). Customer-to-customer co-creation practices in tourism: Lessons from Customer-Dominant logic. *Tourism Management*, 67, 362-375.

Rindskopf, D., & Rose, T. (1988). Some theory and applications of confirmatory second-order factor analysis. *Multivariate behavioral research*, *23*(1), 51-67.

Rita, P., Oliveira, T., & Farisa, A. (2019). The impact of e-service quality and customer satisfaction on customer behavior in online shopping. *Heliyon*, *5*(10), e02690.

Sadd, D. D. (2009). What is event-led regeneration? Are we confusing terminology or will London 2012 be the first games to truly benefit the local existing population?. *Event*

Management, 13(4), 265-275.

Sallnäs, E. L., Rassmus-Gröhn, K., & Sjöström, C. (2000). Supporting presence in collaborative environments by haptic force feedback. *ACM Transactions on Computer-Human Interaction (TOCHI)*, *7*(4), 461-476.

Santos, J. (2003). E-service quality: a model of virtual service quality dimensions. *Managing Service Quality: An International Journal.*

Schmitt, N., & Klimoski, R. J. (1991). *Research methods in human resources management*. South-Western Pub.

Seddon, P. B. (1997). A respecification and extension of the DeLone and McLean model of IS success. *Information systems research*, *8*(3), 240-253.

Shao, C. (2020, January). An empirical study on the identification of driving factors of satisfaction with online learning based on TAM. In *5th International Conference on Economics, Management, Law and Education (EMLE 2019)* (pp. 1067-1073). Atlantis Press.

Short, J., Williams, E., & Christie, B. (1976). The social psychology of telecommunications. John Wiley & Sons.

Sin, L. Y., Alan, C. B., Yau, O. H., Chow, R. P., Lee, J. S., & Lau, L. B. (2005). Relationship marketing orientation: scale development and cross-cultural validation. *Journal of Business Research*, *58*(2), 185-194.

So, K. K. F., King, C., & Sparks, B. (2014). Customer engagement with tourism brands: Scale development and validation. *Journal of Hospitality & Tourism Research*, *38*(3), 304-329.

Sohn, C., & Tadisina, S. K. (2008). Development of e-service quality measure for internet-based financial institutions. *Total Quality Management*, *19*(9), 903-918.

Son, S. M., & Lee, K. M. (2011). Assessing the influences of festival quality and satisfaction on visitor behavioral intentions. *Event Management*, 15(3), 293-303.

Song, J. H., & Hollenbeck, C. R. (2015). The value of social presence in mobile communications. *The Service Industries Journal*, *35*(11-12), 611-632.

Sousa, R., & Voss, C. A. (2006). Service quality in multichannel services employing virtual channels. *Journal of service research*, *8*(4), 356-371.

Sox, C. B., Kline, S. F., Crews, T. B., Strick, S. K., & Campbell, J. M. (2017). Virtual and Hybrid Meetings: A Mixed Research Synthesis of 2002-2012 Research. *Journal of Hospitality & Tourism Research*, 41(8), 945–984.

Spreng, R. A., Harrell, G. D., & Mackoy, R. D. (1995). Service recovery: impact on satisfaction and intentions. *Journal of services marketing*.

Steuer, J. (1992). Defining virtual reality: Dimensions determining telepresence. *Journal of communication*, *42*(4), 73-93.

Stone, R.J., 1993. Virtual reality: toys or tools of the trade? Aslib Proc. 45 (6), 167–181.

Suomi, K., Luonila, M., & Tähtinen, J. (2020). Ironic festival brand co-creation. *Journal of Business Research*, *106*, 211-220.

Swan, K. (2001). Virtual interaction: Design factors affecting student satisfaction and perceived learning in asynchronous online courses. *Distance education*, *22*(2), 306-331.

Szymanski, D. M., & Hise, R. T. (2000). E-satisfaction: an initial examination. *Journal of retailing*, *76*(3), 309-322.

Tabachinick, B. G., Fidell, L. S., & Osterlind, S. J. (2006). *Using Multivariate Statistics*. New York, NY:Pearson.

Tabachnick, B. G., Fidell, L. S., & Ullman, J. B. (2007). *Using multivariate statistics* (Vol. 5, pp.

481-498). Boston, MA: Pearson.

Tarasewich, P. (2003). Wireless device for mobile commerce: User interface design and usability. In *Mobile commerce: technology, theory and applications* (pp. 26-50). IGI Global.

Theodorakis, N., Kambitsis, C., & Laios, A. (2001). Relationship between measures of service quality and satisfaction of spectators in professional sports. *Managing Service Quality: An International Journal*. 11(6), 431-438.

Ting, O. S., Md Ariff, M. S., Zakuan, N., & Sulaiman, Z. (2016). Relationship between e-service quality, e-satisfaction and e-loyalty in B2C e-commerce. *Advanced Science, Engineering and Medicine*, *8*(10), 819-825.

Tkaczynski, A., & Stokes, R. (2010). FESTPERF: A service quality measurement scale for festivals. *Event Management*, 14(1), 69-82.

Todd, L., Leask, A., & Ensor, J. (2017). Understanding primary stakeholders' multiple roles in hallmark event tourism management. *Tourism management*, 59, 494-509.

Tsikriktsis, N. (2002). Does culture influence web site quality expectations? An empirical study. *Journal of service research*, *5*(2), 101-112.

Tu, C. H. (2000). On-line learning migration: from social learning theory to social presence theory in a CMC environment. *Journal of network and computer applications*, *23*(1), 27-37.

Tussyadiah, I. P., Jung, T. H., & tom Dieck, M. C. (2018). Embodiment of wearable augmented reality technology in tourism experiences. *Journal of Travel research*, *57*(5), 597-611.

Udo, G. J., Bagchi, K. K., & Kirs, P. J. (2010). An assessment of customers'e-service quality perception, satisfaction and intention. *International Journal of Information Management*, 30(6), 481-492.

Uhrich, S., & Benkenstein, M. (2012). Physical and social atmospheric effects in hedonic service consumption: customers' roles at sporting events. *The Service Industries Journal*, *32*(11), 1741-1757.

Um, S., Chon, K., & Ro, Y. (2006). Antecedents of revisit intention. *Annals of tourism research*, *33*(4), 1141-1158.

Van Kerrebroeck, H., Brengman, M., & Willems, K. (2017). When brands come to life: experimental research on the vividness effect of Virtual Reality in transformational marketing communications. *Virtual Reality*, *21*(4), 177-191.

Van Niekerk, C., & Page-Shipp, R. (2014). Improving the quality of meetings using music. *Total Quality Management & Business Excellence*, *25*(11-12), 1382-1394.

Vasileiou, K., Barnett, J., Thorpe, S., & Young, T. (2018). Characterising and justifying sample size sufficiency in interview-based studies: systematic analysis of qualitative health research over a 15-year period. *BMC medical research methodology*, *18*(1), 1-18.

Venkatraman, N., & Grant, J. H. (1986). Construct measurement in *organizational strategy research: A critique and proposal. Academy* of management review, 11(1), 71-87.

Wagner, S., Mendez, D., Felderer, M., Graziotin, D., & Kalinowski, M. (2020). Challenges in survey research. In Contemporary Empirical Methods in Software Engineering (pp. 93-125). Springer, Cham.

Wakefield, K. L., & Sloan, H. J. (1995). The effects of team loyalty and selected stadium factors on spectator attendance. *Journal of sport management*, *9*(2), 153-172.

Wang, Y. S., Tseng, T. H., Wang, W. T., Shih, Y. W., & Chan, P. Y. (2019). Developing and validating a mobile catering app success model. *International Journal of Hospitality Management*, *77*, 19-30.

Wei, W., Qi, R., & Zhang, L. (2019). Effects of virtual reality on theme park visitors' experience and behaviors: A presence perspective. *Tourism Management*, *71*, 282-293.

Whiteside, A. L., Dikkers, A. G., & Swan, K. (2017). *Social presence in online learning: Multiple perspectives on practice and research*. Stylus Publishing, LLC.

Wiener, M., & Mehrabian, A. (1968). *Language within language: Immediacy, a channel in verbal communication*. Ardent Media.

Wilkins, H., Merrilees, B., & Herington, C. (2007). Towards an understanding of total service quality in hotels. *International Journal of Hospitality Management*, *26*(4), 840-853.

Witmer, B. G., & Singer, M. J. (1998). Measuring presence in virtual environments: A presence questionnaire. *Presence*, *7*(3), 225-240.

Wolfinbarger, M., & Gilly, M. C. (2003). eTailQ: dimensionalizing, measuring and predicting etail quality. *Journal of retailing*, *79*(3), 183-198.

Wong, I. A., & Fong, V. H. I. (2012). Development and validation of the casino service quality scale: CASERV. *International Journal of Hospitality Management*, *31*(1), 209-217.

Wong, J., Wu, H. C., & Cheng, C. C. (2015). An empirical analysis of synthesizing the effects of festival quality, emotion, festival image and festival satisfaction on festival loyalty: A case study of Macau Food Festival. *International Journal of Tourism Research*, 17(6), 521-536.

Worthington, R. L., & Whittaker, T. A. (2006). Scale development research: A content analysis and recommendations for best practices. The Counseling Psychologist, 34(6), 806-838.

Wreford, O., Williams, N. L., & Ferdinand, N. (2019). Together alone: an exploration of the virtual event experience. *Event Management*, *23*(4), 721-732.

Yang, Z., & Fang, X. (2004). Online service quality dimensions and their relationships with satisfaction. *International journal of service industry management*.

Yang, Z., & Jun, M. (2002). Consumer perception of e-service quality: from internet purchaser and non-purchaser perspectives. *Journal of Business strategies*, *19*(1), 19.

Yi, Y., & Gong, T. (2013). Customer value co-creation behavior: Scale development and validation. *Journal of Business research*, *66*(9), 1279-1284.

Yim, M. Y. C., Chu, S. C., & Sauer, P. L. (2017). Is augmented reality technology an effective tool for e-commerce? An interactivity and vividness perspective. *Journal of Interactive Marketing*, *39*, 89-103.

Yoo, B., & Donthu, N. (2001). Developing a scale to measure the perceived quality of an Internet shopping site (SITEQUAL). *Quarterly journal of electronic commerce*, *2*(1), 31-45.

Yoon, Y. S., Lee, J. S., & Lee, C. K. (2010). Measuring festival quality and value affecting visitors' satisfaction and loyalty using a structural approach. *International Journal of Hospitality Management,* 29(2), 335-342.

Yoshida, M., & James, J. D. (2010). Customer satisfaction with game and service experiences: Antecedents and consequences. *Journal of sport management*, *24*(3), 338-361.

Yuan, J., & Jang, S. (2008). The effects of quality and satisfaction on awareness and behavioral intentions: Exploring the role of a wine festival. *Journal of travel research*, *46*(3), 279-288.

Zahra, A., & McIntosh, A. J. (2007). Volunteer tourism: Evidence of cathartic tourist experiences. *Tourism Recreation Research*, *32*(1), 115-119.

Zaichkowsky, J. L. (1985). Measuring the involvement construct. *Journal of consumer research*, *12*(3), 341-352.

Zeithaml, V. A. (1988). Consumer perceptions of price, quality, and value: a means-end model and synthesis of evidence. *Journal of marketing*, *52*(3), 2-22.

Zeithaml, V. A., Parasuraman, A., & Malhotra, A. (2000). *A conceptual framework for*

understanding e-service quality: implications for future research and managerial practice (No. 115). Cambridge, MA: Marketing Science Institute.

Zenker, S., & Kock, F. (2020). The coronavirus pandemic–A critical discussion of a tourism research agenda. *Tourism management*, *81*, 104164.

Graduate College

University of Nevada, Las Vegas

Sung-Eun Kim

(milleniero@gmail.com)

EDUCATION

University of Nevada, Las Vegas
Degree: Doctor of Philosophy in Hospitality Administration
Committee chair: Dr. Hyelin (Lina) Kim
Major concentration: Destination Marketing
Minor concentration: Event Management
Dissertation title: Measuring Quality of Virtual Events: Scale Development and
                                Validation

Ajou University
Degree: Master of Business Administration
Committee chair: Dr. Sung-Byung Yang
Major concentration: Destination Marketing
Dissertation title: The Effects of Tourism Information Quality in Social Media on
                                Destination Image Formation: The Case of Weibo

Kyonggi University
Degree: Bachelor of Science in Tourism
Major concentration: Event Management

REFEREED JOURNAL

Kim, S. E., Lee, K. Y., Shin, S. I., & Yang, S. B. (2017). Effects of tourism information quality in social media on destination image formation: The case of Sina Weibo. *Information & Management*. 54(6), 687-702.

Kim, S. E., Kim, H. L., & Yang, S. B. (2021). Why not this destination? The effects of travel constraints of independent travelers on destination image formation. *International Journal of Tourism Research*. (Accepted and Forthcoming)

Kim, H. L., Sirgy, M. J., Uysal, M., & **Kim, S. E.** (2021). Enhancing the Quality of Life of Senior Tourists: A Theoretical Perspective. *An International Journal of Tourism and Hospitality Research (Anatolia).* (Accepted and Forthcoming)