

Enhancing the Digital Transformation of Sports Arenas

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Abstract

Developments within digital technology are redefining how spectators will experience sport in the future. Combined with current crises, it creates new demands on how sports arenas can generate visitors to their events. An alternative can be virtual arenas. Therefore, this study aimed to understand the visitor's expectations of a virtual arena and identify key factors that affected potential spectators' intentions to visit a virtual arena. This qualitative study collected empirical data through focus groups. The Unified Theory of Acceptance and Use of Technology 2 (UTAUT 2) was used as a theoretical foundation for the analysis. This study results in an enhanced hypothetical model arguing for additional elements affecting a spectator's intention to visit a virtual arena. Our research contributes to helping shape future research on and practical implementation of virtual arenas.

Keywords

Virtual arena, virtual reality spectatorship (VRS), sports media consumption (SMC), technology acceptance, spectatorship, UTAUT, UTAUT 2

Introduction

Digital transformation (DT) is a megatrend affecting industries, societies, and individuals. Even sports organizations need to adapt to this trend. The previous pandemic has shown that sports enthusiasts might not be allowed to enter an arena. In the future, climate change might affect the number of visitors. Also, changed visitors' behavior and the need to attract new target groups are forcing arenas to adapt to digital transformation. Whereas research is still in a nascent state. (Xiao et al. 2017).

In 2021, a special issue of the scientific journal *Sport, Business and Management* addressed the topic of digital transformation for sports management research. This special issue calls to bridge the gap between sports management and information systems to examine the potential of digital transformation. "There is an urgent need to bridge various disciplines with their own theoretical frameworks and approaches toward digital transformation" (Ströbel, Stieler, and Stegmann 2021, 5). Digital transformation is "a process that aims to improve an entity by triggering significant changes to its properties through combinations of information, computing, communication, and connectivity technologies" (Vial 2019, 118). Virtual Reality Spectatorship (VRS) is a growing trend in Sports Media Consumption (SMC) (Kim and Ko 2019), which falls under the definition of DT. SMC is the consumption of sports via different digital medial channels. Characteristics of SMC are the possibility to take part anywhere and anytime (Koronios et al. 2020). The relationship between participating in sports digitally and visiting an arena's physical space is symbiotic rather than competitive. Furthermore, the consumption of sports via media motivates future physical visits to arenas (Kim et al. 2019).

Especially, VRS can improve the experience of sports enthusiasts (Rynarzewska 2018). Thus, VRS is highly relevant as an alternative and complement to the physical space of an arena. Both together can lead the way for a digital transformation of sports arenas. To fill the research gap, we aim to answer the following research questions:

- What are the expectations of the users of VRS?
- Which factors play a crucial role in the usage of VRS?

Our research further develops the VRS concept and digitalization of sports arenas. Especially arenas, for less popular sports, struggle to attract audiences. Our study can, in the long run, contribute to novel concepts of how to transform arenas digitally.

Theoretical frameworks

The theoretical foundation is based on users' acceptance of new technology, sports consumption, value creation for spectators, and VR for sports media. These are aspects of the so-called digital transformation (Vial 2019).

The Unified Theory of Acceptance and Use of Technology (UTAUT) results from an empirical comparison between eight different acceptance models. UTAUT is primarily based on an organizational perspective and has since been developed into UTAUT2, based on a user perspective (Venkatesh, Thong, and Xu 2016). Within the frameworks, the three factors, performance expectation, expected effort, and social influence, directly impact the user's behavioral intention to use a certain technology. Some facilitating conditions and the user's behavioral intention impact the actual user behavior. Gender, age, experience, and volunteering are significant moderating elements. Other elements concerning a user perspective are value for money, hedonic motivation, and habit, impacting both the user's behavioral intention and the actual use. Both frameworks provide a solid theoretical foundation, so they are well suited to evaluate the use and acceptance of new information technology. (Alghatrifi and Khalid 2019; Venkatesh, Thong, and Xu 2016).

Information consumption plays a significant role in SMC. While betting on sports, access to information is of great importance to the sports consumer (Rynarzewska 2018) especially in probability-based betting (Gray and Gray 1997). Knowledge acquisition was a vital motivating factor for spectators participating in e-sports via digital channels. Also, the medium that distributes the sport digitally has a crucial role in the spectator's satisfaction, based on the medium's role as an information and content distributor (Sjöblom, Macey, and Hamari 2020).

Sports supporters need to be able to discuss sports with others (Parry, Jones, and Wann 2014). Especially when the spectators know each other already, it impacts their general satisfaction (Koenig-Lewis, Asaad, and Palmer 2018). A general perceived feeling of connection to a sport drives supporters to stay and support a team. While the feeling of connection to a specific team impacts how often a supporter attends sports events (Mahony et al. 2002; Koronios et al. 2020). A high team identification results in increased sports consumption via electronic media (Parry, Jones, and Wann 2014).

Spectators consume sports based on their expectations, motives, and experiences. First-time spectators are motivated by price value, interaction, and physical environmental quality elements. For them, there is a strong connection between the physical environment and social value. The use of the entire arena, where additional accessibility such as guided tours and meetings with athletes, is value-creating to satisfy returning spectators. (Jones and Byon 2020). Also, people with lower team identification are affected to a greater degree by social and physical aspects of the arena (Kim et al. 2019).

General user satisfaction within VR applications is based on their flow experience (Kim and Ko 2019). Flow is “the state in which people are so involved in an activity that nothing else seems to matter” Csikszentmihalyi (2009, 4). Sports is such an activity that consistently gives rise to flow experiences (Csikszentmihalyi 2009). Flow is a recurring concept in research on SMC and VRS (Kim et al. 2019; Kunz and Santomier 2019). Increased media interactivity, involvement in a specific sport, and identification with a particular team strengthen the feeling of presence in VRS and thus the viewer’s flow experience. Interestingly, VR technology has a higher effect on the flow experience of people who are less involved in the sport itself. Thus, VRS can be used to attract new target groups (Kim and Ko 2019). The consumption of sports media and physical attendance of sports events are complementary, as media consumption can influence and inspire to visit physical arenas as spectators (Kim et al. 2019). Relating to UTAUT 2, performance expectation, social influence, and hedonic motivation significantly affect users’ flow experience. Content quality affected the user experience and the users’ intention to use VR technology (Kunz and Santomier 2019). The vision is to create virtual worlds with digitized, interactive participation, in which personalization and socialization have central roles. On a negative note, increased digital presence might affect users’ integrity and the use of the user’s personal information (Sturm 2020).

Method

We conducted this study as part of the development of the New Jägersro. For over 100 years, Jägersro has been one of Sweden’s most visited arenas. It has organized many prestigious trotting races (Skånska Travsällskapet 2022). In 2018, the owners of Jägersro decided to build a new, modern, and future-oriented facility for trotting sports. The new Jägersro will be opening in 2024 and will be designed based on the vision to become Europe’s leading horse center. To succeed with the vision, it is central to be at the forefront of technological and sustainable development. In addition, the aim is to enhance operations, create new business models and attract new customer groups, which are elements of a digital transformation (Vial 2019)

To realize the data collection, we collaborated with the New Jägersro and its external project managers. Even before the Covid-19 pandemic, different stakeholders discussed how visitors could digitally experience the New Jägersro in the future without having to go to the arena physically. At the same time, getting new audiences interested in the arena for later visits is essential. Thus, the idea of a VR environment evolved. Besides the practical need to explore the usage of VR at the New Jägersro, the theoretical need to conclude a specific application exists.

The study aims to generate an enhanced understanding of VRS. To contribute to this aim, an exploratory approach with qualitative data collection is appropriate (Creswell 2013). As a data collection method, we conducted three focus groups. They allow having several different perspectives on the same subject and induce a discussion between participants. Also, we take on a phenomenological approach to focus on the common meaning for several individuals rather than an individual's own experience (Creswell 2013). The focus groups were conducted via the video conferencing tool Zoom. We applied strategic sampling to recruit 14 participants in total. To reduce bias, we set up a purely female (5 participants), a strictly male (4 participants), and a mixed group (5 participants). Also, the first two groups were sports enthusiasts. The third group was professionals working in technology-related jobs. The age ranged between 20 and 30. This age range is familiar with digital technologies and is an afterthought target group for the arena. Stimulus material was presented to the focus groups to foster a common discussion (Krueger and Casey 2015). The stimulus material was designed as a textual story that described how a family on-site in Italy visited the virtual Jägersro with the help of VR technology. Data from the focus groups were transcribed and firstly deductively coded using UTAUT 2 (Venkatesh, Thong, and Xu 2016) as a point of reference. UTAUT 2 is recommended as a basis for future research in information technology (Alghatrifi and Khalid 2019). In a second inductive round of inductive coding, we were looking for new concepts to enhance UTAUT 2 with specific elements regarding digital arenas. During the coding procedure, we used the qualitative data analysis tool Nvivo.

Results

From our data, we extracted different factors which affected the focus group participants' intention to visit the virtual arena. In the following, we give brief descriptions and definitions.

The study's authors have defined **expected improved information and experience consumption** as the degree to which the user feels that the virtual arena contributes to extended use of information, which aims to improve the experience. Together with the desire to have a lot of information available, the desire arose to be able to customize the own experience. Thus, the second factor is the **expected opportunity for a personalized experience**, which we define as the degree to which the user feels that the virtual arena is adaptable to her personal preferences and ensures high-quality content. According to the focus groups, it was important to maintain the feeling of a common and shared social experience. Thus, we define **expected opportunity for social interaction** as the extent to which the user feels that the virtual arena contributes to a communicative exchange and offers opportunities for interaction. The virtual arena must be easy to use, easy to navigate, and easy to understand. Thus, we define **expected effort** as the degree of simplicity related to using the virtual arena. Among other factors we identified is the **price value**, which plays a crucial role in motivating a visit to the arena. **Social influence** was noticed to be important in case interest in the sports is weak. According to all the focus groups, **interest** in the sport was significant for a visit to a virtual arena. Some participants expressed that the concept seemed so exciting that they could have imagined visiting the virtual arena for a test, even without interest in trotting.

Analysis & discussion

To develop an adopted acceptance model for virtual arenas, we use UTAUT 2 as a baseline (Alghatrifi and Khalid 2019; Venkatesh, Thong, and Xu 2016). As its elements are rather generic, we need to argue on a more specific sub-element level. No pre-existing elements in UTAUT 2 will be removed, even if the empirical evidence of the current study has not addressed all the elements.

Expected improved information and experience consumption in connection with the virtual arena was an important aspect that would contribute to the visit becoming more rewarding, which is testified by other research, too (Gray and Gray 1997; Mahony et al. 2002; Rynarzewska 2018; Sjöblom, Macey, and Hamari 2020). Users seek to take part in more information on statistics and history. Also, they desire access to more culture around the sport, interviews, and other media-related content. Furthermore, sports organizations can strengthen spectator satisfaction by offering exclusive material (Rynarzewska 2018). In betting, improved information consumption can be crucial for the user's performance (Gray and Gray 1997). Thus, an improved possibility of information consumption can positively affect the visitor's experience of the virtual arena, increasing the user's intention to visit it.

Users wanted access to spaces in the virtual arena that they would otherwise not have had access to. In a physical sports environment, hedonic motivation and quality of an experience are significantly crucial for returning visitors (Jones and Byon 2020). Virtual worlds can more easily offer greater accessibility, exclusivity, spatial proximity, and insider perspective (Sturm 2020) making a visit more pleasurable. Our results show an expectation of improved information and experience consumption affecting both performance expectations and hedonic motivation.

Experiences become unique through the opportunity to customize for personal choices, which is strengthened within research (Jones and Byon 2020). Our data indicate that the possibility of choosing camera angles can contribute to a better experience. Improved media interactivity can strengthen the feeling of presence, which is positive for the viewer's flow experience (Kim and Ko 2019). Flow experience has been proven crucial for the spectator's general satisfaction (Csikszentmihalyi 2009; Kim and Ko 2019; Kunz and Santomier 2019). Digitized, interactive participation, where personalization and socialization have central roles, could contribute to an improved spectator experience (Sturm 2020). Thus, there is strong evidence that the opportunity to personalize an experience can contribute to the visitor experiencing both more hedonic motivation and performance expectations.

Socialization is central to an improved spectator experience (Sturm 2020). According to the focus groups, it was important to maintain the feeling of a common and shared social experience, even if the experience takes place digitally. Research claims that social interaction contributes to spectators' general satisfaction (Koenig-Lewis, Asaad, and Palmer 2018). Therefore, opportunities for social interaction, such as discussing sports events with others, are decisive (Parry, Jones, and Wann 2014). Additionally, visitors with lower team identification are affected more by social and physical aspects in an arena (Kim et al. 2019; Jones and Byon 2020).

Like performance expectation, the expected effort is the result of a compilation of several different factors (Venkatesh, Thong, and Xu 2016). Our results show that requirements for the user need to be

small. Expected effort includes user-friendliness. Sports organizations can create positivity around VR implementation by emphasizing user-friendliness (Rynarzewska 2018). Also, results showed that easy accessibility and technical performance are important. Thus, effort-oriented technical factors have the greatest impact at an early stage when the user must cross thresholds (Davis, Bagozzi, and Warshaw 1989; Szajna 1996).

For the focus groups, price value influences the participants' willingness to visit the virtual arena. The price value is an element in UTAUT 2 as well. The technology's benefits need to outweigh the economic cost (Venkatesh, Thong, and Xu 2016). According to the focus groups, price value was more critical when the interest in the sport was low. Price value is more decisive for first-time spectators (Jones and Byon 2020). This suggests that value for money is a decisive factor in the user's intention to visit the virtual arena and that interest in the sport is a moderating element that affects value for money.

Our results show concerns linked to an AI-related feeling of invasion of privacy and the feeling of loss of control. Oh and Yoon (2014) identified trust as an element that directly impacts user behavior. Privacy, trust, and security are significant factors for the users of online services. A lack of trust in a system is due to a lack of sense of control (Hoffman, Novak, and Peralta 1999). Thus, the concerns of our study could be interpreted as trust issues. Therefore, trust can be a factor influencing the user's intention to visit a virtual arena.

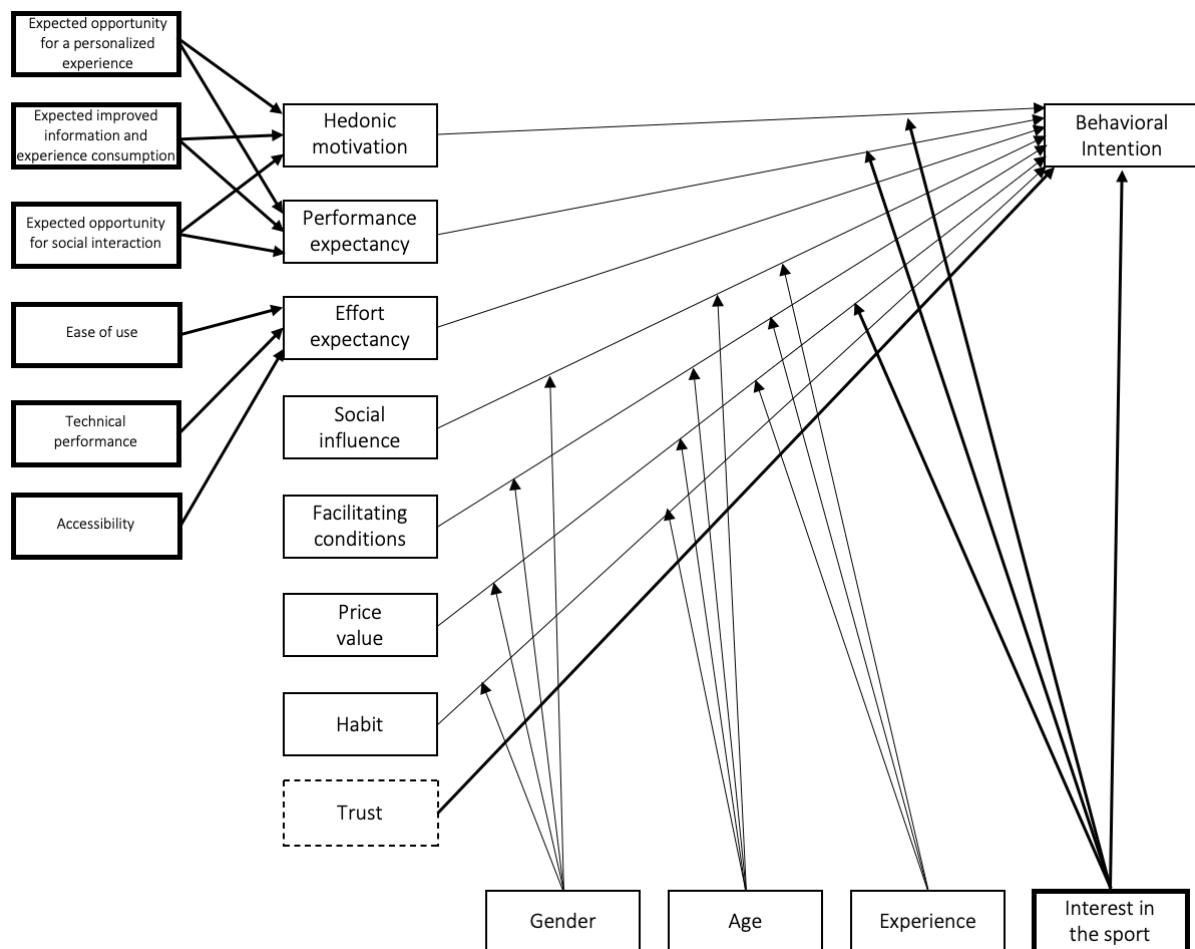


Figure 1. UTAUT 2 extended to fit the concept of a virtual arena

The interest in the sport influences the study participants' willingness to visit the virtual arena. The perceived feeling of connection to the sport, in general, drives supporters to stay and support a team for a long time (Mahony et al. 2002). Thus, interest in the sport can be considered to have a direct impact on the user's intention to use the technology. Also, it can be a moderating element on price value, the opportunity for social interaction, and the opportunity for a personalized experience.

We claim that VR in sports contexts can improve the spectator experience, based on the focus groups' positive attitude to the concept and previous research (Kunz and Santomier 2019; Rynarzewska 2018; Sturm 2020). Figure 1 visualizes the above discussion. New connections are illustrated with thicker lines. Trust can be an influencing factor depending on how AI is implemented. This dependency is shown as a dashed line. The actual user behavior has not been investigated as the concept of this particular virtual arena was only at an idea stage and was not developed. Thus, we were not able to measure the actual user behavior. Therefore, our proposed hypothetical model illustrates only the intention to use.

Conclusion

Based on the study's analysis and discussion, we concluded that the visitor expects a unique holistic experience with access to exclusive material and areas. Expected opportunity for social interaction, expected improved information and experience consumption, and expected opportunity for personalized experience have an indirect impact on the user's intention to use the virtual arena through hedonic motivation and performance expectation. Furthermore, accessibility, user-friendliness, and technical performance indirectly impact the user's intention to use the virtual arena through expected effort. Also, our study states that price value is a strong, decisive factor. Depending on how AI is used, trust can be a new factor with a direct impact. Finally, we concluded that interest in the sport is a new moderating factor that directly impacts the user's intention to visit the virtual arena. For the research community, the contribution of our study is a revised hypothetical model. For practical application, we concluded that the virtual arena contributes an added value to the physical arena. A sought implementation is of value to offer opportunities for social interaction, contribute with improved information and experience consumption, be adaptable to personal preferences, ease the expected effort, offer a reasonable price-value, and observe the privacy of the users.

Our study focused on a specific case but was enriched with findings from other studies. Still, our developed hypothetical model needs to be tested for generalizability by a more extensive quantitative data collection. Another limitation is using a scenario instead of a real implemented system. Future research could implement some critical functions in a more advanced prototype. Also, we conducted this study with sports enthusiasts but not specifically interested in trotting. A controlled study with trotting enthusiasts could sharpen the findings. Nevertheless, there seems to be potential for a virtual arena to be an element in the broader picture of DT, opening for enhanced customer contact, new business models, and streamlined operations.

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