Taking fan engagement to a new level – assessing sports consumer interest in virtual environments and Web3 activations

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Abstract

Purpose – This paper explores sports consumer interest in virtual environments (VE) and Web3 activations, specifically how the level of psychological involvement, consumers' generational cohorts and previous experience with VE and Web3 activations influence consumer interest in VE and Web3 products and services related to their favorite sports team.

Design/methodology/approach – A survey instrument was developed and distributed online resulting in a sample size of $n = 526$. The survey was designed to measure consumers' psychological involvement with their favorite sports team based on the Psychological Continuum Model, and to determine respondents' interest in potential VE and Web3 activations. Finally, the survey collected demographical information and data regarding respondents' previous experience with VE and Web3 applications. Multiple regression analysis was subsequently conducted to predict the impact of (1) psychological involvement, (2) consumers' generational cohorts and (3) previous experience with VE and Web3 activations on the dependent variable consumer interest in VE and Web3 activations.

Findings – The regression model showed a significant impact of the independent variables on consumer interest in VE and Web3 activations with consumer involvement exerting the highest influence. Consumers' previous experience with VE and Web3 applications also seems to trigger interest, in line with the consumption capital theory. This study also suggests that younger generational cohorts are not intrinsically more attracted to VE and Web3 activations but their interest seems to depend on the type of activation.

Research limitations/implications – This study is intended as a first assessment of independent variables that may have an impact on sports consumer interest in VE and Web3 activations. Further research is needed to assess the impact these variables combined with other indicators may have on consumer interest, for instance by employing a Structural Equation Modelling (SEM) approach. This research included selected VE and Web3 applications comprising online games, NFTs and cryptocurrencies, to calculate a VE and Web3 Literacy Score for the purpose of this paper. However, the "umbrella term Web3" (Wang *et al.*, 2022) could indicate a number of additional applications not considered in this research. Future studies could examine sports consumer experience with additional Web3 activations when assessing VE and Web3 Literacy.

Practical implications – The results of this research imply the need for a diversification of the VE and Web3 portfolio offered by sports teams to cater to different consumer segments. Upcoming challenges for sports teams include motivating younger consumers to take an interest in Web3 activations beyond gaming. Additionally, sports teams should encourage loyal supporters in the advanced stages of the PCM who possess limited VE and Web3 experience, to engage in VE and Web3 activations through simplified offers complementing their overall fan experience.

Originality/value – VE and Web3 activations currently offered by sports teams are still in their early stages and data underpinning their success is scarce. This is the first study examining variables that may influence consumer interest in a sports context.

Keywords Consumer behavior, Consumer involvement, Sport team fans, Consumption capital, Virtual environments, Web3, NFTs, Sports industry, Sports teams

Paper type Research paper

Virtual environments (VE) and Web3 applications provide sports organizations with innovative tools to enhance fan engagement, foster consumer loyalty and drive revenue growth in the medium term. The term "virtual environment" is commonly used as a substitute term for platforms otherwise known as "virtual worlds" which have been defined as "shared, simulated spaces which are inhabited and shaped by their inhabitants who are represented as avatars" (Girvan, 2018). "Web3 is an umbrella term used to describe a new generation of Internet services" where users can transact directly (peer-to-peer) based on blockchain technology, thereby eliminating intermediaries and removing the influence of central regulators (Liu *et al.*, 2021; Wang *et al.*, 2022). VE can either be centrally-managed, for instance by their developers or publishers, or they can incorporate Web3 technologies enabling users to conduct peer-to-peer transactions recorded on the blockchain, such as purchasing and owning digital property. An overview of definitions and relevant examples is provided in Table 1. As the maturing technology increasingly blurs the lines between centrally-managed VE and Web3 technology from a consumer perspective, this study assesses the aggregate sports consumer interest in VE and Web3 applications related to their favorite sports team.

Term	Description	Relevant examples
Virtual environments (VE)	The term "virtual environment" is commonly used as a substitute term for platforms otherwise known as "virtual worlds" which have been defined as "shared, simulated spaces which are inhabited and shaped by their inhabitants who are represented as avatars" (Girvan, 2018). This definition comprises traditional Web2 environments as well as VE based on Web3 technology	a) Online games like Roblox (https://www.roblox.com) and Fortnite (https://www.fortnite.com) which are centrally managed by their developer or publisher and based on Web2 technology b) Online games like Axie Infinity (https://axieinfinity.com) which are decentralized, based on Web3 technology c) Virtual environments based on Web3 technology without specific gaming concepts such as Decentraland (https://decentraland.org), Upland (https://www.upland.me), or the Sandbox (https://www.sandbox.game)
Web2	Web2 represents a shift from static, read-only websites to interactive and dynamic platforms that allow user-generated content and collaboration. Web2 platforms revolutionized the way users interacted with the web, giving rise to a new era of user participation and social networking enabling features like comments, ratings and sharing options, and allowing users to engage with each other and build online communities (Hiremath and Kenchakkanavar, 2016; O'Reilly, 2007)	a) Online games like Roblox and Fortnite which are centrally managed by their developer or publisher and based on Web2 technology b) Social media
Web3	"Web3 is an umbrella term used to describe a new generation of Internet services" where users can transact directly (peer-to-peer) based on the blockchain technology, thereby eliminating intermediaries and removing the influence of central regulators (Liu *et al.*, 2021; Wang *et al.*, 2022)	a) Online games like Axie Infinity (https://axieinfinity.com) which are decentralized, based on Web3 technology b) Virtual environments based on Web3 technology without specific gaming concepts such as Decentraland, Upland, or the Sandbox c) Non-fungible tokens (NFTs) d) Cryptocurrencies

Table 1.
Essential definitions and examples

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Leveraging VE and Web3 activations requires sports organizations to understand the drivers of sports consumer behavior (Wann and James, 2019, pp. 85-88) and the needs of different target groups. If sports organizations succeed in creating activations that provide real value for their fans and elevate their fan experience, VE and Web3 activations have enormous potential to help improve the situation of the financially troubled sports industry (e.g. Alaminos and Fernández, 2019; Deloitte, 2021). VE and Web3 activations also provide the chance to engage supporters continuously even when competitions are taking a break. This is particularly important for sports organizations like the Fédération Internationale de Football Association (FIFA), which organize their flagship events, only every couple of years and thus lack the permanent exposure and ability to consistently engage supporters during events. Popular teams also have fanbases around the globe with Spanish soccer team Barcelona, for instance, boasting almost 60 million fans in Europe alone. Many fans around the world will never have the time or money to visit a match at Barcelona's home ground Camp Nou and professional teams have therefore turned to pre-season matches that are played abroad and cater to their global fan bases. English Premier League club Manchester United visited Thailand and Australia in 2022, where they also played national rivals Liverpool and Crystal Palace (Marsh, 2022). Team supporters tend to remain faithful to their teams for life, but they may choose to dedicate more of their scarce time to other activities at the expense of their team (and its revenue). In addition to such overseas trips, it will therefore become increasingly important for sports teams to constantly keep in touch with their local and global fanbases through digital activations and new innovative entertainment opportunities leveraging the benefits of VE and Web3. Examples of professional football clubs starting to explore VE activations include Manchester City, an English club owned by the City Football Group whose majority stake is controlled by the Abu Dhabi United Group. Manchester City has recently entered into an agreement with Sony to develop a virtual version of their stadium hosting avatar stadium tours among other activations (Lewis, 2022). Football governing body FIFA launched "FIFA World" within the Web2 immersive environment of Roblox, just ahead of the FIFA World Cup in Qatar, where users complete obstacle courses and compete with other online players. Players are then ranked depending on their performance and can even win rewards. The National Football League (NFL) released "NFL Tycoon" on Roblox, letting fans build, play and learn in their own NFL-centered world through a combination of the popular tycoon and simulator genres on Roblox where nearly 50 million users are connected daily (Roblox, 2022). However, actual Web3 activations sports organizations have been experimenting with, are still in their early stages and data underpinning their success is scarce. Ahead of the World Cup in 2022, FIFA announced a partnership with Web3 platform Upland allowing fans to visit a digital version of the Lusail stadium (where the FIFA World Cup Qatar final was played) and to collect digital merchandise related to the World Cup (FIFA, 2022). No data has been published assessing the success of this activation. There are nevertheless a few success stories related to Web3 activations, such as the NBA's NFT trading platform Top Shot, which had more than 1 million registered users as of September 2021 and made the headlines for some spectacular NFT sales (Conti, 2023).

Despite these developments and the recent interest in VE and Web3, no extensive research exists examining how activations have been accepted by consumers in the sports industry. More precisely, there is a gap in the literature examining the variables that may influence sports consumer interest in VE and Web3 activations, which will be addressed in this study by answering the following research questions:

(1) Is there a relationship between the level of consumer involvement with their favorite sports team and their interest in VE and Web3 activations?

(2) Is there a relationship between consumers' generational cohort, and their interest in VE and Web3 activations related to their favorite sports team?

(3) Does previous experience with VE and Web3 applications influence consumer interest in VE and Web3 products and services related to their favorite team?

Answering these questions will lay a foundation for future in-depth research of sports consumer behavior in the context of VE and Web3 activations related to sports teams. Additionally, this paper seeks to provide insights to help practitioners better understand their customers and develop a VE and Web3 product and service portfolio based on their concrete needs.

Theoretical concepts and framework development

Sports consumers, spectators and fans

Funk *et al.* (2016) describe four general types of sports consumers: active consumers (i.e. participants), consumers of tangible sports products (i.e. consumers of sports apparel and products) and passive sports consumers (i.e. spectators). The authors also suggest a fourth category, the consumers of sports events, due to their potential link with sports tourism and "the global recognition that sports tourism is one of the fastest developing forms of travel (Funk *et al.*, 2016, p. 50)". Other texts focus on the distinction between sports consumers who are mere "spectators", that is they follow sporting events via media or in person, and "fans". This distinction between "spectators" and "fans" is relevant because an individual attending a sporting event in person accompanying her friends, for instance, would be classified as a "spectator" even if she had no particular interest in the sport in contrast to the "fans" attending who are individuals interested in a particular "sport, team and/or athlete" (Wann and James, 2019, p. 2). "Sport *team* fans" are sport fans with a preference for a specific team (Funk *et al.*, 2016, p. 46). While this study focuses on sport team fans, it is acknowledged that "maintaining a consistent use of" the terms "sports consumer", "spectator" and "fan" is difficult as many of them are "often used interchangeably" in the literature (Wann and James, 2019, p. 3). This paper therefore uses the broader term "sports consumer" while recognizing that the focus of the study is on the sports consumer subset of sport team fans.

Web 2 and Web 3

While some VE are based on Web3 technology, other virtual worlds, notably those created by the developers of online games such as Roblox (https://www.roblox.com) or Fortnite (https://www.fortnite.com), are often referred to as "Web2" applications since in their current form, they do not use a decentralized approach (Wang *et al.*, 2022). Nevertheless, these Web2 applications share certain similarities with their Web3 counterparts despite their differences in underlying technology and design principles: Both have user interfaces (UI) that allow users to interact with elements such as menus, controls and settings. The UI design may vary, but the core purpose of facilitating player interaction remains the same. Web3 and Web2 applications can incorporate multiplayer functionality in games, enabling players to compete against or collaborate with each other, or simply interact with other users (Murray *et al.*, 2023). This fosters social interactions and enhances the user experience. Ultimately, both types of applications aim to entertain users and provide enjoyable experiences. The key difference between Web2 and Web3 applications is that the latter leverage decentralized blockchain technology, enabling features such as the creation and sale of unique digital assets called NFTs (non-fungible tokens) (Baker *et al.*, 2022) as well as the use cryptocurrencies to conduct transactions (Poongodi *et al.*, 2020). Since the maturing Web3 technology offers new features game developers are starting to explore how they can incorporate the merits of Web3 into their games. Epic Games' Chainmonsters, for example, does not run on any blockchain but users can now buy their own NFTs in cooperation with ImmutableX (https://market.immutable.com/) and then use these in the game, just like other skins (Epic Games, n.d.). Epic

Games' most popular online game Fortnite does currently not use any Web3 technology either but there have been discussions around the potential and how Web3 applications like NFTs could enhance user experience by owning and trading those skins directly inside Fortnite or on secondary market such as OpenSea while a sales commission on every transfer would be earned by Epic Games (Allions, 2023).

It is important to note that Web2 VE like Roblox and Fortnite have certain advantages over the emerging Web3 technology: They have matured over time and offer user-friendly interfaces that are intuitive and familiar to most users. On the other hand, Web3 applications are still in their early stages and often require technical knowledge to navigate. Web2 typically have centralized governance structures, where a central authority or organization has control over the platform's rules, policies and decision-making. This can allow for more efficient decision-making and coordination compared to the decentralized nature of Web3 platforms. Web2 applications have also been optimized for speed and scalability over the years, enabling them to handle large volumes of users and data while Web3 platforms, may face challenges related to scalability and performance due to the decentralized nature of their infrastructure. Last but not least, there are legal questions regarding Web3 applications like NFTs, that need to be resolved before a widespread adoption can take place (Wang *et al.*, 2022). As a result, many Web2 applications, particularly popular online games such as Fortnite and Roblox are reporting 80 million and 202 million monthly active users respectively, compared to Web3-based VE like Decentraland and the Sandbox - with 56,000 and 200,000 monthly active users (Kulasooriya *et al.*, 2023).

To assess sports consumer interest in the context of VE and Web3 activations, this study draws on the concepts of consumer involvement, generational cohorts and consumption capital. The concept of consumer involvement has been widely used in sports-related studies to determine how the level of psychological attachment affects consumer behavior, such as the decision to attend a sport event or purchase merchandise (Funk *et al.*, 2016; Wann and James, 2019). When assessing consumer behavior in the context of technology and innovation, research suggests that consumers' generational cohorts may play a key role (Calvo-Porral and Pesqueira-Sanchez, 2020; Fietkiewicz *et al.*, 2016; Krishen *et al.*, 2016; Metallo and Agrifoglio, 2015). Finally, consumer behavior can be significantly impacted by consumers' knowledge, or "consumption capital" of a good or service (Stigler and Becker, 1977). These concepts are shown in Figure 1 and discussed in more detail below.

Consumer involvement
Sports consumers' interactions and purchase decisions are considerably impacted by their attachment to a sports object. Research suggests that attached and highly involved sports consumers are often less price sensitive (Calabuig *et al.*, 2014), for instance when purchasing tickets (Bae *et al.*, 2021). The psychological attachment of consumers to a sports object, or more precisely, their attachment to a sports team which is examined in this study, therefore
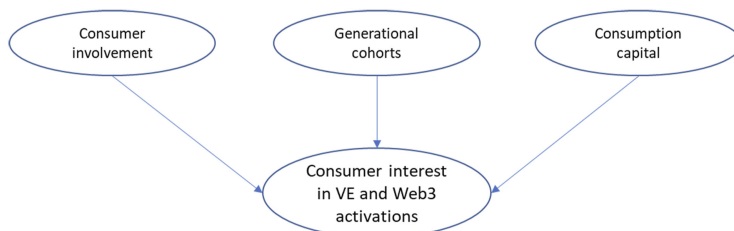
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influences their willingness to "invest resources" and affects the decision whether and how often to attend a match, purchase merchandise or visit the club's website (Da Silva and Las Casas, 2017). Consumers with strong connections perceive spending resources (i.e. time and money) less as a "sacrifice" but as a means to support their team. Loyal consumers are also likely to purchase products such as match tickets, merchandise, or TV subscriptions on a continuous basis (Zeithaml, 1988; Da Silva and Las Casas, 2017). For sports organizations, it is therefore imperative to understand the psychological connection stages of their consumers to develop targeted marketing strategies with the objective to create loyal consumers. The Psychological Continuum Model (PCM) developed by Funk and James (2001) aims to identify how consumers form connections with sports objects and how these change over time. The four stages of psychological involvement, Awareness, Attraction, Attachment and Allegiance, described by the PCM, represent the evolution sports consumers go through when developing connections with a sports object. Funk *et al.* (2016) suggest that when sports consumers first learn about a sports object, they "enter an elevator" (Funk *et al.*, 2016, p. 172) which starts at the lowest level, the Awareness Stage, and they then continuously progress through the subsequent stages influenced by the evaluation of personal, psychological and environmental inputs. This paper applied the logic of the PCM to examine relationships between the level of consumers' psychological involvement and their interest in potential VE and Web3 products or services related to their favorite sports team, leading to the following initial research hypothesis:

H1. Highly involved consumers will be more interested in VE and Web3 activations related to their favorite sports team compared to consumers with weaker psychological connections.

Generational cohorts

In addition to consumers' psychological connection with their favorite team, there may be other variables influencing the level of consumer interest in VE and Web3 activations, such as their age group, or generational cohort. Consumers who belong to the same generational cohort and grew up in a similar cultural context, share common experiences resulting in similar purchase behavior and "level of buyer involvement for distinct types of products" (Parment, 2013). Fietkiewicz *et al.* (2016) point out that "in the last decades not only the technology has changed, but also the attitude and motivation of its users", highlighting that generational cohorts and their consumption preferences have been particularly impacted by technological developments.

The older cohorts included in this study are Baby Boomers (BB) and Generation X. Baby Boomers, the aging generation born between 1946 and 1964 (Fietkiewicz *et al.*, 2016), saw the rise of television and advertising but many of them were already halfway through their professional careers when social media arrived. Boomers are still one of the most important economic sources as they delay their retirement and still hold executive roles in organizations. They are sometimes criticized by their younger colleagues for not embracing technology fast enough and sticking to traditional ways of doing business (Kotler *et al.*, 2021). The following Generation X was born between 1965 and 1980 and experienced major consumer technology shifts. They listened to tapes on their Walkman during their youth, experienced the rise and decline of CDs, MP3s and DVD rentals in their adulthood, and the shift to video streaming. Most importantly, Generation X entered the workforce in a world where the Internet was adopted by organizations making them the early adopters of connectivity. They are now one of the most influential generations in the corporate world, holding many leadership positions or having established their own successful businesses (Kotler *et al.*, 2021). Generation Y, also known as Millennials, who were born roughly between 1981 and 1996, have sometimes been labeled the "most visually sophisticated of any generation" (Williams *et al.*, 2012, p. 127) as

they grew up with the Internet and, in many cases, reached adolescence after the first social media platforms had emerged. The following Generation Z, which includes individuals born between 1997 and 2012, has many features in common with Millennials. Both of these younger generations are tech-savvy and regularly engage with social media. However, the literature suggests that Generation Z was even more exposed to the frequent use of technology at home by their parents who are more familiar with digital gadgets as compared to previous generations of parents (Fietkiewicz *et al.*, 2016). Generation Z was born when the Internet had already become mainstream, so they are sometimes considered the first "digital natives". They have no experience of living without the Internet and therefore see "digital technologies as an indispensable part of daily life" (Kotler *et al.*, 2021, Part II, Chapter 2, 11:37). Generation Z leverages technology to consume media in a different way compared to their older peers: As Haenlein *et al.* (2020) point out, they watch streaming services rather than TV, they listen to Spotify rather than radio and they rely on online blogs or forums instead of traditional magazines. Differences in user preferences, depending on their generational cohort can also be observed by comparing the use of different social media platforms, for instance. According to Statista (2022a), 25% of TikTok users in the United States in 2021 were between 10 and 19 and another 22.4% are between 20 and 29 years old showing that almost half of all TikTok users belong to Generation Z or the later part of Generation Y. Forecasts by Statista project that TikTok's user group belonging to Generation Z is expected to grow even further over the next years (Statista, 2022a). According to research conducted by the Pew Research Center in 2021 among American adults, users aged 18 to 24 are especially likely to use Instagram (76%), Snapchat (75%), or TikTok (55%). However, only 2% of users aged 65 and above said they used Snapchat. These age gaps between the youngest and oldest American user groups appear narrower for Facebook: 70% of users aged 18 to 29 say they use the platform and among the older users aged 65 and older, still, 50% stated that they used the site. This makes Facebook one of the most used social media platforms among the older American population (Auxier and Anderson, 2022). Based on the impact technology has on different generational cohorts and their consumer behavior, the following hypothesis was derived:

H2. Sports consumers belonging to younger generational cohorts (Generations Y and Z) will be more interested in VE and Web3 activations related to their favorite teams compared to their older peers (Generations X and BB).

Consumption capital
Research by Nobel Prize winners Stigler and Becker (1977) suggests that consumers' perceived usefulness of goods (or services) does not depend solely on quality. Equally important, if not even more important, is the consumer's knowledge of the goods (or services) in question. The more consumers know about them, the higher the perceived utility of a good or service. For instance, connoisseurs who often listen to music will have more music knowledge and will appreciate "good" music more compared to individuals with less knowledge. At the same time, consumers accumulate additional knowledge through "exposure and age", thereby increasing their "consumption capital" (Stigler and Becker, 1977). In line with this theory, consumption capital, that is consumers' level of knowledge about VE and Web3 applications and their experience play a crucial role in this study when predicting perceived usefulness, or interest in VE and Web3 activations. Accumulating consumption capital is of course problematic if the actual products or services comprising VE and Web3 applications are not specified or even unknown to consumers. For instance, despite the recent media attention "the metaverse" has received, 31% of American adults said they had never heard of the metaverse according to a survey conducted by Statista (2022b) in the US, in January 2022. Almost one-third of surveyed adults stated they had heard of

the metaverse but were unfamiliar with it, and only 14% stated to be very familiar with the metaverse. This indicates that even in developed economies, metaverse activations have not yet reached the majority of mainstream users. The assumption that consumers need to possess a certain consumption capital, or level of VE and Web3 Literacy, to perceive applications related to their favorite sports teams as interesting, leads to the following hypothesis:

H3. Consumers' level of VE and Web3 Literacy will have a significant impact on consumer interest in activations related to their favorite sports team.

Method: developing a survey construct and data collection

Since this is the first attempt to determine variables that may influence consumer interest in VE and Web3 activations related to sports teams, a survey construct needed to be developed based on the theoretical concepts discussed above.

Survey construct

The survey construct focused on examining the preferences of a specific target group: sports consumers with a favorite sports *team*, sometimes labeled "sport team fans" (Funk *et al.*, 2016, p. 46). Based upon previous studies, it is known that individuals who follow a particular sport are not necessarily identical with supporters developing a preference for a specific sports *team* (e.g. Branscombe and Wann, 1991; Funk *et al.*, 2016, p. 46; Wann and James, 2019, p. 4 ff.). The survey, therefore, started with a screening question to exclude sports consumers without team preference. The following Sections 1 and 2 contained questions using a seven-point Likert scale where 1 = strongly disagree, and 7 = strongly agree. Responding to questions in Sections 1 and 2 was mandatory to increase the completeness of the dataset and make it suitable for the planned statistical analysis. Particularly in regression analysis, missing data can cause issues (Haitovsky, 1968). Section 3 contained non-mandatory multiple-choice questions allowing respondents to skip answering questions about their age group and gender.

Section 1 of the survey aimed to establish how involved respondents are with their favorite sports team using the tested PCM methodology with its three-dimensional approach measuring the facets of (1) Pleasure, (2) Sign and (3) Centrality (Funk *et al.*, 2016). Survey items of Section 1 were developed using Funk *et al.* (2016), p. 206 ff. and Matsuoka (2001) as input adapting the recommended questions to this study. The "Pleasure" facet describes how much pleasure consumers associate with their favorite sports team. "Sign" measures the symbolic value of the sports team, by assessing how close the respondents perceive their team's values in relation to their own values. The "Centrality" facet refers to the central role the team has in a consumer's life (Beaton *et al.*, 2009). Beaton *et al.* (2009) also suggested an algorithm to allocate sports consumers to one of the stages of the PCM, based on their scores for each facet. To determine respondents' PCM stage, mean scores for each facet were calculated and the classification of either high (>5.65), medium (4.5–5.65), or low (<4.5) involvement was applied for each facet following the rationale provided by Beaton *et al.* (2009) and Doyle *et al.* (2013). An algorithm outlined by Beaton *et al.* (2009) was then applied to place individual respondents into one of the PCM stages. In general, respondents in the awareness stage of the PCM are likely to have low scores across all three facets, while consumers in the allegiance stage will exhibit high scores across all facets. While this study followed the tested PCM approach, a PCM Overall Average Score (PCMOAS) for each respondent was calculated in addition based on the scores for each PCM facet which indicates how closely respondents feel connected to their favorite sports team. The PCMOAS was used as one key independent variable in the regression analysis conducted for this research.

Section 2 of the survey was designed to determine the interest of respondents in a range of potential VE and Web3 activations related to their favorite sports team including purchasing and collecting NFTs, taking part in virtual engagement activities (virtual stadium tours, attending matches or post-match press conferences as well as interactions with other fans in virtual surroundings) and playing games in immersive environments. As highlighted above, there is limited research available regarding sports consumers' interest in VE and Web3 activations. Additionally, activations currently offered by sports organizations are still in their infancy stages which has so far limited the opportunities to research user experiences. Survey items for Section 2 were therefore developed using available studies on consumer motives to participate in traditional sporting events, combined with motivations to play Web2-based online games, as well as motivations to purchase and collect digital assets, that is sports NFTs, including research by Baker *et al.* (2022), Demetrovics *et al.* (2011), Funk *et al.* (2009, 2016), Pritchard *et al.* (2009), Wann and James (2019), as well as Yee (2006). The questions in Section 2 determining respondents' interest in NFTs were developed using results by Baker *et al.* (2022) who state that "collecting can be either a means of making an investment or as a signal demonstrating support and knowledge of an athlete, team, or sport" thus suggesting that NFTs, being "the most recent innovation in collectibles" are perceived as useful by team supporters (Baker *et al.*, 2022). Spencer *et al.* (2003) point out that bartering collectibles with other enthusiasts is part of the experience for collectors, and pioneering NFT marketplaces such as OpenSea (https://opensea.io/) as well as NFT platforms operated by the NBA (https://nbatopshot.com/) or FIFA (https://collect.fifa.com/) consequently offer trading options to enhance collectors' experience. Based on the above inputs, four broad categories were identified to measure consumer interest in VE and Web3 activations of their favorite sports team in Section 2 of the survey: (1) Perceived usefulness, (2) Social interaction, (3) Escapism and self-expression, as well as (4) Esteem and competition. As noted by Funk *et al.* (2009), the dominance of categories to measure hedonic motives (2-4) compared to utilitarian (1) motives is explained by the subjective nature of sports experiences described above. "Perceived usefulness', the utilitarian category, describes the value users derive from participating in activations in VE like stadium tours, attending matches, or post-match press conferences to gather insights and background information on their teams. "Social interaction' refers to users' wishes to interact with others and belong to a group. In other papers (e.g. Yee, 2006; Demetrovics *et al.*, 2011) this category is referred to as "relationship" or "social" and intends to measure users' motivation "to interact with other users, and their willingness to form meaningful relationships that are supportive in nature, and which include a certain degree of disclosure of real-life problems and issues" (Yee, 2006). "Escapism and self-expression" measures user interest in taking part in online events of their team to forget some of their real-life problems and to relieve stress (e.g. Wann and James, 2019, p. 71 ff.). Additionally, VE may offer users the opportunity to "be someone else" and express themselves in ways not possible in the physical realm or assuming roles they cannot assume in their daily lives (Yee, 2006) when interacting with others. The fourth category of survey Section 2, "Esteem and competition" "represents a desire for competency" (Funk *et al.*, 2016) and a wish to compete with others, for instance in gaming activities, to feel a sense of achievement through reaching goals and accumulating "items that confer power" (Yee, 2006). Particularly the "Esteem and competition" category focuses on examining consumer interest in popular online games which are mostly Web2 based. An example are games like FIFA World on Roblox, where users compete with other players, collect virtual tokens and are then ranked depending on their performance. Further engagement is incentivized through rewards which can be redeemed to obtain additional equipment for player avatars or at virtual partner shops in the game.

According to Funk *et al.* (2016), the selected categories to study consumer behavior may change, depending on the context of the research (e.g. spectator sports vs. active sports

participation). Additional categories used in previous research to assess motivations of sports consumers to attend sporting events, such as the SPEED model (Funk *et al.*, 2009) for instance, include "Performance" and "Excitement" which were seen as less relevant for this study compared to other categories in an online activation context, as they are specific to live events. Further categories to explain user motivations to play online games are "Manipulation", "Achievement" (Yee, 2006), as well as "Skill development" and "Competition" (Demetrovics *et al.*, 2011).

Based on respondents' individual scores in survey Section 2 categories (1) Perceived usefulness, (2) Social interaction, (3) Escapism and self-expression, as well as (4) Esteem and competition, an "Interest Overall Average Score" (IOAS) was calculated for each respondent, indicating each respondent's combined interest in VE and Web3 activations related to her favorite sports team.

Section 3 of the survey contained non-mandatory multiple-choice questions to collect data regarding respondents' interest in sports, demographics, as well as their "VE and Web3 Literacy". A VE and Web3 Literacy Score (VE&WLS) was calculated based on respondents' experience with VE and Web3 applications. A "high" score indicates that respondents have experience in all three VE and Web3 application types covered in this study, that is they have played games in virtual environments, purchased NFTs *and* owned cryptocurrency (score = 3). A "moderate" score implies experience with two types of applications (score = 2) and a "low" score indicates experience with one of these (score = 1). Respondents were not asked to appraise their experience, that is the VE&WLS only considers previous exposure of respondents to VE and Web3 applications, regardless of whether it was a positive or negative experience.

The complete survey questionnaire is provided in the Appendix.

Testing the survey construct

While Section 1 of the survey is based on the tested PCM methodology (Funk *et al.*, 2016), Section 2 of the survey construct was developed specifically for this study. Cronbach's Alpha was therefore calculated to determine the internal consistency of the construct and to identify any questions with a notable variance that may require modification (Bonett and Wright, 2014). For Section 2 (16 items, 7-level Likert scale), a Cronbach's Alpha of 0.955 was computed, based on the total survey responses ($n = 526$). These results indicate that response values for each participant across the scale items within Section 2 were in agreement. No Cronbach's Alpha was determined for Section 3, as this section did not contain any scale items.

Data collection procedure

A link to the self-administered questionnaire was first shared publicly via LinkedIn and 85 complete responses were collected between 7 November and 12 December 2022. Additionally, a panel was purchased via Survey Monkey Audience [1], requesting at least 400 complete answers targeting the US market. Overall, a total of 526 complete survey responses were received until 19 December 2022 (85 via replies to the LinkedIn post and 441 via Survey Monkey Audience). Respondents were not directly paid or otherwise compensated for their participation by the researchers.

Survey participants who followed the link were first presented with a summary of the intentions and scope of the project. After providing informed consent, they first had to answer the screening question, and participants who indicated that they did not have a favorite sports team were thanked and disqualified from the survey (20% of Survey Monkey Audience respondents).

The survey objectives, methodology and content were reviewed and approved by the Ethics Committee of the university.

Results

Descriptive statistics

46% of respondents were female and 52% were male (missing percent identified as "other" gender or did not reply to this question). About 15% of survey respondents self-identified as Generation Z, 31% as Generation Y, 31% as Generation X and 20% as Generation BB. Most respondents (about 90%) were located in the United States of America (US), primarily due to the fact that the purchased Survey Monkey Audience panel targeted US users. In summary, the sample suggests a reasonably gender- and generation-balanced view, with a slight underrepresentation of Generation Z.

In terms of previous VE and Web3 experience, 19% of survey respondents scored high, 19% moderate, 33% low and 30% had no experience at all. Broken down by type of VE and Web3 experience, 57% of respondents have played an online game in VE, 44% have owned cryptocurrency and 26% have purchased an NFT. Broken down by generational cohort, most respondents of Generation Z have played an online game (84%), while 69% of Generation Y and 51% of Generation X have played an online game. However, only 25% of respondents belonging to the Baby Boomer generation have played online games. Baby Boomers have also owned cryptocurrencies less frequently compared to other cohorts (20% of Baby Boomers, compared to 46% of Generation Z, 57% of Generation Y and 44% of Generation X), and only 10% of Boomers have purchased an NFT. NFTs seem to be the least popular Web3 experience across all other generational cohorts as well with only 19% of Generation Z, 33% of generation Y and 32% of Generation X respondents stating that they have ever purchased an NFT. Generation X respondents were the most interested in VE and Web3 applications with the highest mean IOAS. They also reached the highest mean scores in the individual categories "Perceived usefulness", "Social interaction" and "Escapism and self-expression", while Generation Z respondents reached the highest mean score in the category "Esteem and competition". Table 2 summarizes means scores and standard deviations across all respondents ($n = 526$):

Statistical analysis

The objective of this paper was to provide an initial assessment of various independent variables potentially influencing consumer interest in VE and Web3 activations related to their favorite sports team. To "evaluate the relative impact" of a number of independent variables on one single dependent variable, regression analysis was considered a suitable tool (Nusair and Hua, 2010; Zou et al., 2003). In this study, multiple regression analysis was conducted to evaluate the impact of the independent variables consumer involvement, consumer generational cohorts and consumers' VE and Web3 experience on the dependent variable consumer interest in VE and Web3 activations. Table 3 offers an overview of the independent variables used in this research to predict the effect on consumer interest in VE and Web3 activations and to test the research hypotheses:

In addition to linearity, linear regression analyses require normal distribution of residuals, independence of residuals (no autocorrelation), as well as homoskedasticity of residuals. For multiple regression analyses, which use more than one predictor variable, it also needs to be ensured that there is no exact linear correlation between the independent variables, that is that no multicollinearity exists. Before conducting the multiple regression analysis in this study, simple scatterplots were created in SPSS to establish that there was a linear relationship between the used predictors and the outcome variable. Normality was established by examining the PP plots and the normal distribution curve of the dependent variable. There were no outliers detected with standardized residuals between −3.124 and 2.69. To test for the assumption of homoskedasticity, the scatterplots of standardized residual errors versus predicted errors were examined. Scatterplots are the recommended form of

Table 2.
Overview of variables and summary statistics ($n = 526$)

Variable	Description	Mean	SD	Min	Max
PCM Overall Average Score	Average score of facets (1)–(3)	4.7450	1.16520	1.00	7.00
(1) Pleasure Average	Items included (1 = strongly disagree; 7 = strongly agree) 1. I really enjoy watching my favorite team play 2. Watching my favorite team play offers me relaxation when pressures build up 3. Following my team is one of the most satisfying things I do	5.2687	1.23032	1.00	7.00
(2) Sign Average	Items included (1 = strongly disagree; 7 = strongly agree) 4. Following my favorite team says a lot about who I am 5. You can tell a lot about a person by seeing the team he/she follows 6. When I watch my team play, I can really be myself	4.5089	1.33881	1.00	7.00
(3) Centrality Average	Items included (1 = strongly disagree; 7 = strongly agree) 7. I find a lot of my life is organized around following my team on TV, online, live etc. 8. My team has a central role in my life 9. I enjoy discussing my team with friends and family	4.4575	1.43006	1.00	7.00
Interest Overall Average Score	Average score of categories (1)–(4)	4.284815	1.37931	1.00	7.00
(1) Perceived usefulness Average	Items included (1 = strongly disagree; 7 = strongly agree) 10. I would purchase digital collectibles/NFTs representing my team 11. A stadium tour in a virtual environment would be interesting 12. Attending a match in a virtual environment would be interesting 13. Attending a post-match press conference in a virtual environment would be interesting	4.4620	1.40686	1.00	7.00
(2) Social interaction Average	Items included (1 = strongly disagree; 7 = strongly agree) 14. I would purchase digital collectibles/NFTs to trade them with others 15. I would take part in virtual activities to interact with other supporters of my team 16. A virtual space for fans would offer an opportunity to build real friendships 17. I would take part in virtual activities in the metaverse to interact with my team's players, coach, or their avatars	4.1497	1.56465	1.00	7.00
(3) Escapism and self-expression Average	Items included (1 = strongly disagree; 7 = strongly agree) 18. I would take part in virtual events of my team to distract myself from some of the real-life problems I have 19. I would take part in virtual events of my team when I feel bored 20. I would buy digital collectibles/NFTs (e.g. club shirt, customized cap) to customize my avatar 21. A virtual environment would give me the opportunity to be whom I want to be	3.9235	1.59066	1.00	7.00
(4) Esteem and competition Average	Items included (1 = strongly disagree; 7 = strongly agree) 22. I would take part in online games to compare my knowledge with other supporters 23. It would give me pleasure to win an online game 24. I would enjoy competing online with other supporters of my team 25. I would enjoy collecting rewards and becoming more powerful in the game	4.6041	1.47195	1.00	7.00
VE and Web3 Literacy Score	Items included (yes = 1; no = 0) 30. Have you ever played an online game in a virtual environment (e.g. Roblox, Fortnite)? 31. Have you ever owned cryptocurrency? 32. Have you ever purchased an NFT?	1.27	1.080	0.00	3.00

Source(s): Created by authors

graphical representation when variables are numerical scores like those in the present study (e.g. Anderson *et al.*, 2002; Backhaus *et al.*, 2016; Johnson and Kuby, 2011). Independence of observations was examined using the Durbin–Watson Test to check for independence of errors and multicollinearity was tested using Variance-Inflation-Factors (VIF). The largest VIF in the conducted regression analysis was 2.003, which is considerably below the 10.0 benchmark for multicollinearity (e.g. Mason and Perreault, 1991; Hair *et al.*, 1998) suggesting that the independent variables in the model are not correlated amongst each other.

An alpha level of 0.05 was used for all statistical tests and data was analyzed using IBM SPSS Version 29.

For data protection reasons, questions in Section 3 of the survey were not mandatory and some respondents chose not to disclose their generational cohort. These incomplete responses were excluded from the multiple regression analysis, leading to a sample size of $n = 518$. The dependent variable, Interest Overall Average Score (IOAS), was regressed on the predicting variables PCM Overall Average Score (PCMOAS), Generational Cohorts GC_1 (Generation Z), GC_2 (Generation Y) and GC_3 (Generation X) as well as VE and Web3 Literacy Score (VE&WLS). GC_4 (Baby Boomers) was used as a reference variable. The results indicate that the model can be used to predict Interest Overall Average Score, $F (5, 512) = 121.557$, $p < 0.001$. The coefficient of determination $R^2 = 0.543$ depicts that the model explains 54.3% of the variance in consumer interest in VE and Web3 activations.

PCMOAS had a significant impact on the dependent variable IOAS ($\beta = 0.741$, $p < 0.001$) in support of H1. While the independent variable GC_3 (Generation X) had an impact on the dependent variable and was statistically significant ($\beta = 0.337$, $p < 0.005$), GC_1 (Generation Z) and GC_2 (Generation Y) were not significant ($p > 0.05$) indicating that these independent variables did not have a significant impact on IOAS. H2 was therefore not supported by these results. Respondents' VE&WLS on the other hand had a significant impact on the dependent variable IOAS ($\beta = 0.293$, $p < 0.001$) in support of H3.

Table 4 offers an overview of the results:

The observed impact and significance of generational cohort variables are corroborated by the IOAS means which show that the mean scores of interest in VE and Web3 activations

Hypotheses	Independent variables	Dependent variable
H1	PCM Overall Average Score (PCMOAS)	Interest Overall Average Score (IOAS)
H2	Generational cohorts (GC_1, GC_2, GC_3, GC_4)	
H3	VE&Web3 Literacy Score (VE&WLS)	
Source(s): Created by authors		

Table 3.
Independent and dependent variables used in multiple regression

Hypotheses	Regression weights	β	t	p-value	Hypothesis supported
H1	PCMOAS → IOAS	0.741	19.868	<0.001	yes
H2	GC_1 (GenZ) → IOAS	0.052	0.360	0.719	no
	GC_2 (GenY) → IOAS	0.164	1.325	0.186	
	GC_3 (GenX) → IOAS	0.337	2.805	0.005	
H3	VE&WLS → IOAS	0.293	6.975	<0.001	yes
R^2	0.543				
F (5, 512)	121.557				
Source(s): Created by authors					

Table 4.
Summary of findings from multiple regression analysis ($n = 518$)

are not inherently higher for younger generations (Generation Z and Generation Y) compared to older generations (Generation X) as illustrated in Table 5:

The fact that in this study younger generational cohorts did not score higher regarding their interest in VE and Web3 activations compared with their older peers may be explained by the survey construct which calculated the IOAS based on different VE and Web3 activation types including NFTs, virtual engagement and games, some of which seem to be more popular among older respondents.

A closer look at the relationship between VE&WLS and respondents' generational cohort confirms that there is no strong correlation between cohorts and VE&WLS either. Again, this observation is partly explained by the method used in this study to calculate the VE&WLS as the score does not only consider online gaming experiences, which are prevalent among respondents of Generation Z with 84% having played an online game. However, the VE&WLS also reflects respondents' experience with cryptocurrencies and NFTs which were more popular among older generational cohorts, particularly Generation Y and X, with 33% of generation Y and 32% of Generation X respondents stating they had purchased NFTs, for instance, compared to only 19% of Generation Z respondents.

Conclusion: what does this mean for sports teams?

This paper explored sports consumer behavior in the context of VE and Web3 activations, specifically how the level of consumer involvement, together with consumers' generational cohorts and previous experience with VE and Web3 activations could be used to predict consumer interest in activations related to their favorite team.

Influence of predictors

The results indicate that the predictors in the regression model had a significant impact on consumer interest in VE and Web3 activations with the level of consumer involvement, measured using the facets of the Psychological Continuum Model (PCM), exerting the highest influence. Most of the generational cohort predictors used in the regression model to examine the influence of generational cohorts on the interest in VE and Web3 activations were not statistically significant except for the Generation X predictor. Generation X also has the highest mean score of interest in VE and Web3 activations (IOAS). Consumers' previous experience with VE and Web3 applications, that is VE and Web3 Literacy, had a significant impact and may have an even larger influence on sports consumers' interest in activations in virtual environments than the respondents' generational cohort. Interestingly, the survey only asked respondents to indicate their previous VE and Web3 experience without inquiring whether this experience was positive or negative. Irrespective of the type of experience (positive vs. negative), previous VE and Web3 experience, the accumulated consumption capital, seems to trigger consumers' interest, in line with the results of the research conducted by Stigler and Becker (1977). Conversely, consumers who have never engaged in activities in

Generation code	Mean	SD	n
Baby Boomers	3.7555	1.42065	103
Generation X	4.4970	1.42462	167
Generation Y	4.4055	1.29997	168
Generation Z	4.3836	1.16111	80
Total	4.3024	1.37041	518
Source(s): Created by authors			

Table 5.
Mean scores of interest in Web3 activations (IOAS) by generational cohort ($n = 518$)

virtual environments and thus have scored low on VE and Web3 Literacy, seemed to be less interested. This observation is particularly thought-provoking considering highly involved sports consumers who are in the Allegiance stage of the PCM but have limited VE and Web3 experience which may prevent them from engaging with activations related to their teams.

This study also suggests that respondents of younger generational cohorts are not intrinsically more interested in VE and Web3 activations but their interest seems to depend on the type of activation. As outlined above, Generation Z respondents only reached the highest mean score regarding their level of interest in VE and Web3 activations in the survey category "Esteem and competition" where questions focused on gaming activations. However, Generation Z respondents scored lower in the categories "Perceived usefulness", "Social interaction" and "Escapism and self-expression" which had asked survey participants to state their level of interest regarding Web3 activations including NFTs, as well as activities in virtual settings, such as virtual stadium tours, attending matches or post-match press conferences and interactions with other fans in virtual surroundings.

Implications for sports teams
For practitioners, the results of this research demonstrate the need for diversification of their VE and Web3 portfolio offered by sports teams to cater to different consumer segments. Dedicated activations should be designed keeping in mind consumers of older generational cohorts who possess considerably more purchasing power compared to Generation Z (Best, 2018), particularly Generation X and Baby Boomers, "who will continue to be the wealthiest generation in the United States until at least 2030" (Fedder *et al.*, 2018). In the case of Generation X and Generation Y, they even have more experience with Web3 applications such as NFT investments and cryptocurrencies compared to their younger counterparts. Sports teams can leverage this accumulated consumption capital by offering consumers of Generations X and Y Web3-based products and services from which they derive value, addressing the utilitarian category "Perceived usefulness". An example would be offering NFTs with a concrete use case. For instance, NFTs that can be used as a season ticket and linked to a club rewards program offering rewards for season ticketholders who regularly visit the stadium on matchdays. Additionally, Generation X consumers may also appreciate digital team collectibles which can be bartered with other fans considering their interest in "Social interaction".

Playful elements such as Web2-based gaming activations in immersive environments, seem to appeal primarily to younger generations and should therefore focus on this consumer group, for example when designing game concepts and visuals. The Roblox platform, for instance, is clearly geared towards a younger audience with 29% of global users aged from 9 to 12 years and 25% even under the age of 9 (Statista, 2021). Roblox may thus offer an option for sports teams to engage with this young audience and to foster their attachment to their sports team at this critical age when many life-long psychological connections to sports objects are beginning to form (Funk *et al.*, 2016, p. 71). Developing innovative VE activations leveraging Web2-based online games such as Roblox may also bear lower risk for sports organizations compared to their Web3-based counterparts due to their mature technology and stable user base outlined above. Considering the lower purchasing power of younger consumers, free gaming activations could be used to initially attract them while adding additional elements at a later stage to encourage spending. Web3 concepts such as the purchase of NFTs and cryptocurrencies could eventually be incorporated into online games to make these more appealing to younger generations, by selling avatar equipment within an online game as a unique NFT, following the example of Epic Games' Chainmonsters.

Upcoming challenges for sports teams include motivating younger consumers to take an interest in Web3 activations beyond Web2-based gaming and expand their Web3

consumption capital. Additionally, sports teams should encourage loyal supporters in the advanced stages of the PCM who possess limited VE and Web3 experience, to take part in VE and Web3 activations through simplified offers. The key to success will not be to replace "traditional" activities, such as match attendance but to complement them with VE and Web3 activations which provide real value and elevate consumers' overall fan experience.

Limitations

This study is intended as a first assessment of independent variables that may have an impact on sports consumer interest in VE and Web3 activations. Further research is needed to assess the impact these variables combined with other indicators may have on consumer interest, for instance by employing a Structural Equation Modelling (SEM) approach.

This research included selected VE and Web3 applications comprising online games, NFTs and cryptocurrencies, to calculate a VE and Web3 Literacy Score for the purpose of this paper. However, the "umbrella term Web3" (Wang *et al.*, 2022) could indicate a number of additional applications not considered in this research. Future studies could examine sports consumer experience with additional Web3 activations when assessing VE and Web3 Literacy.

While the concept of generational cohorts has been widely used in research, the exact "years of birth (. . .) proposed in the literature vary" and "voices in the literature suggest the emergence of" different subgroups, particularly to further subdivide Generation Y (Fietkiewicz *et al.*, 2016). Additional research is therefore needed to verify if such subgroups are required for more exhaustive analyses of consumer behavior in the context of VE and Web3 activations. The concept of generational cohorts also assumes that people growing up in the same period experienced similar conditions, and are consequently likely to share similar values. However, this may only be true for individuals growing up in a similar cultural context as well, for instance in the Western hemisphere including the United States, Britain, Australia and some countries in Europe. Other countries and regions of the world have experienced different events over time and generational cohorts there may therefore differ (Sarraf, 2019). Egri and Ralston (2004), for instance, reject the theory of the same generational groups in all countries, comparing generational groups in both the United States and China. Sarraf (2019) discusses generational cohorts in China, India and Iran, amongst others and observes differences "both in the number of generational groups of countries and in the time period for each generation in each country." These differences in generational cohorts may even be more relevant for earlier generations which were less connected with their international peers compared to more recent generations with access to the Internet and social media.

Generation Z respondents may statistically be underrepresented in the sample due to the fact that only respondents aged 18 and older were included in the Survey Monkey audience panel. Hence, a significant part of Generation Z, which was born after March 2005 and had not yet come of age at the time of this research, was excluded from the survey.

The survey was exclusively administered online and required Internet access. People with no Internet access are therefore not represented in this research.

Results discussed in this paper should be applied carefully to the population of sports team supporters due to the method of data collection which was based on convenience sampling and may therefore not be representative. There is an ongoing discussion on the challenges web-based surveys may face "since the selection mechanism for non-probability samples is typically unknown and treating non-probability samples as if they were a simple random sample often leads to biased results" (Tutz, 2023).

Note

1. Total cost for 400 complete responses (incidence rate: 50–74%) excl. VAT: CHF 2,396 (CHF 5.99 per answer) plus CHF 184 VAT, paid for by researchers.

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Further reading

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Appendix

A. Survey questions
Screening question (Survey Monkey Audience)
    Do you have a favorite sports team?

Section 1: Determine sports consumer involvement
PCM Overall Average Score (PCMOAS)
    Please rate the following statements (seven-level Likert scale)
Pleasure

(1) I really enjoy watching my favorite team play.

(2) Watching my favorite team play offers me relaxation when pressures build up.

(3) Following my team is one of the most satisfying things I do.

Sign

(4) Following my favorite team says a lot about who I am.

(5) You can tell a lot about a person by seeing the team he/she follows.

(6) When I watch my team play, I can really be myself.

Centrality

(7) I find a lot of my life is organized around following my team on TV, online, live etc.

(8) My team has a central role in my life.

(9) I enjoy discussing my team with friends and family.

Section 2: Determine interest in Web3 activations
Interest Overall Average Score – IOAS
   Please rate the following statements (seven-level Likert scale)
Perceived usefulness

   (10) I would purchase digital collectibles/NFTs representing my team.

   (11) A stadium tour in a virtual environment would be interesting.

   (12) Attending a match in a virtual environment would be interesting.

   (13) Attending a post-match press conference in a virtual environment would be interesting.

Social interaction

   (14) I would purchase digital collectibles/NFTs to trade them with others.

   (15) I would take part in virtual activities to interact with other supporters of my team.

   (16) A virtual space for fans would offer an opportunity to build real friendships.

   (17) I would take part in virtual activities in the metaverse to interact with my team's players, coach, or their avatars.

Escapism and self-expression

   (18) I would take part in virtual events of my team to distract myself from some of the real-life problems I have.

   (19) I would take part in virtual events of my team when I feel bored.

   (20) I would buy digital collectibles/NFTs (e.g. club shirt, customized cap) to customize my avatar.

   (21) A virtual environment would give me the opportunity to be whom I want to be.

Esteem and competition

   (22) I would take part in online games to compare my knowledge with other supporters.

   (23) It would give me pleasure to win an online game.

   (24) I would enjoy competing online with other supporters of my team.

   (25) I would enjoy collecting rewards and becoming more powerful in the game.

Section 3: Interest in sports, demographic questions/Web3 Literacy

   (26) Which team sport do you enjoy following most?

   (27) Which year was the first major sporting event you followed?

   (28) Please indicate your gender

   (29) Please select when you were born

Web3 Literacy Score – WLS

   (30) Have you ever played an online game in a virtual environment (e.g. Roblox, Fortnite)?

   (31) Have you ever owned cryptocurrency?

   (32) Have you ever purchased an NFT?

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