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### Calling for information systems research on esports An overview study

Ke, Xiaobo; Wagner, Christian; Du, Helen S.

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## Calling for Information Systems Research on Esports: An Overview Study

Xiaobo Ke

*City University of Hong Kong, xiaoboke-c@my.cityu.edu.hk*

Christian Wagner

*School of Creative Media City University of Hong Kong*

Helen S. Du

*School of Management Guangdong University of Technology*

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## Calling for Information Systems Research on Esports: An Overview Study

**Xiaobo Ke**

School of Creative Media  
City University of Hong Kong  
*xiaoboke-c@my.cityu.edu.hk*

**Christian Wagner**

School of Creative Media  
City University of Hong Kong

**Helen S. Du**

School of Management  
Guangdong University of Technology

### Abstract:

Online gaming has become a pervasive entertainment activity, and its professionalization has resulted in esports (i.e., electronic sports)—a new blend of sport and business. Esports has a promising future given its widespread acceptance and significant business value. Its innovative nature necessitates more research to help understand and shape its future. We hold that scholars, especially information systems (IS) researchers, should pay more attention to this phenomenon since the IS discipline has a key interest in examining esports' constituents (i.e., people, organizations, and technologies). To increase research attention and help readers understand esports, we compiled this research overview. In it, we first comprehensively define esports. Then, we summarize the esports development. We outline the current state of research in general and systematically review the IS perspective. Based on these efforts, we propose an esports research framework with four promising IS research avenues. We end by discussing "IS contributions" to esports and this overview's implications. This study serves as a foundation for comprehensively mapping the esports practice and research landscape. We hope our findings can help others, especially IS researchers, more clearly understand esports and guide them towards creating increasingly impactful works.

**Keywords:** Esports Development, Information Systems, Literature Review, Research Framework.

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## 1 Introduction

Video games have become the most popular form of leisure information systems (IS) (Hamari & Keronen, 2017). In fact, over 60 percent of the online population plays video games (Newzoo, 2019b). While hedonic factors constitute a major reason why people play video games, we have also seen a rise in more professional and competitive gaming, which has resulted in so-called electronic sports (esports) (Seo, 2016; Sjöblom & Hamari, 2017). Esports covers a subset of video gameplay, sanctioned and played in competition-like formats, coordinated by different leagues, ladders, and tournaments. Esports has gradually gained recognition as a new form of sport and possibly a formal sport in the future (Jenny, Manning, Keiper & Olrich, 2017; Hallmann & Giel, 2018). Indeed, highly recognized traditional sports competitions such as the Asian Olympic Games in 2018 have already successfully added esports as demonstration events (with five games: League of Legends, StarCraft, Hearthstone, Clash Royale, and Arena of Valor).

Two factors—video gameplay's sportification (Funk et al., 2018; Hamari & Sjöblom, 2017) and the considerable business potential that esports entrepreneurship offers—explain why esports has grown in popularity in recent years. Due to the growing prevalence of online video games and online broadcasting technologies, esports has become increasingly popular (Hamari & Sjöblom, 2017; Sjöblom et al., 2020), which has led many to enthusiasts and proactive investment from numerous brands. For example, the grand final in the 2018 League of Legends (“LoL”, a popular esports game) World Championship attracted over 200 million concurrent spectators (Esports Charts, 2018), while the four games in the NBA finals in the same year attracted fewer than 18.5 million spectators each (SportsMediaWatch, n.d.)<sup>1</sup>. Meanwhile, Newzoo (2019a) has anticipated brands to invest US\$1.5 billion in total in esports entrepreneurship in 2022, which will further cultivate the rapidly developing esports ecosystem.

Given the potential for esports to become a new sport and digital business, academic research can offer scholarly guidance, provide principles for best practices, and separate facts from fiction for practitioners (McFarland & Ployhart, 2015). Academic research also needs to facilitate or even help develop and shape how we understand esports. Esports comprises people (e.g., players), technology (e.g., video games), and organizations (e.g., league teams and sponsors)—all important elements in IS research (Hevner et al., 2004). Thus, we pose that IS researchers should facilitate efforts to develop research on esports. In this vein, we can expect esports research to become an increasingly interesting subject in the IS discipline (Hamari & Sjöblom, 2017). Nevertheless, although some seminal studies have emerged in relevant areas such as motivations for spectating esports (Hamari & Sjöblom, 2017), esports consumption (Seo, 2016), esports gambling (Macey & Hamari, 2018), esports marketing (Ji & Hanna, 2020), no significant parallel research development has occurred possibly due to the rapid pace at which the industry has evolved (Hamari & Sjöblom, 2017; Freeman & Wohn, 2017; Martončík, 2015; Jin, 2010). As a rapidly developing and highly dynamic area, esports continues to innovate relationships between technology, people, and organizations. As a result, many new phenomena have emerged, such as the digital-first phenomenon (Baskerville et al., 2020), esports ethos in video game behaviors (Seo, 2016), and the disruptive force that esports has on the traditional sports industry. However, researchers have not sufficiently examined these new (mostly IS relevant) phenomena despite their criticality for esports development. Thus, academic research on esports, which includes IS research on the topic, has lagged behind the esports industry's commercial and societal impact. Indeed, we found few studies on esports in various related areas (Bertschy et al., 2020; Freeman & Wohn, 2017; Hamari & Sjöblom, 2017; Jin, 2010; Martončík, 2015; Pizzo et al., 2018; Reitman et al., 2019).

To call for scholars to pay more attention to esports as an understudied phenomenon, we conducted this overview study. Specifically, in this paper, we propose an esports research framework and provide insights for IS scholars to shape esports research in the future. To do so, we 1) comprehensively define esports by unifying and refining previous definitions, 2) summarize how esports has evolved over time to understand the phenomena today, and 3) outline the status quo of esports research based on reviewing extant esports studies in two stages. Based on these efforts, we propose an esports research framework for the IS discipline. In this framework, we suggest four promising research avenues for future work. We conclude by discussing “IS contributions” to esports research and this overview study's implications.

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<sup>1</sup> We retrieved data from <https://www.sportsmediawatch.com/nba-finals-ratings-viewership-history/>

## 2 Esports Background

In this section, we first summarize the current ways in which researchers and practitioners have defined esports to extract the key elements that characterize the phenomenon. Based on reviewing previous definitions, we propose a more comprehensive definition to help scholars and practitioners better understand the concept. In addition, we also illustrate how esports has evolved over time to help readers better understand the phenomena today.

### 2.1 Esports Definition

As scholars across various research disciplines have conducted conceptual, qualitative, and quantitative research to examine sports, so too have they offered various ways to define the phenomenon (Hamari & Sjöblom, 2017). To our best knowledge, Hemphill (2005) offered the earliest academic esports definition. Subsequently, other scholars proposed other definitions (e.g., Wagner, 2006; Jenny et al., 2017) to capture new facets of the emerging phenomenon.

After reviewing the definitions in the literature (see Table 1), we found five elements that capture the phenomenon's core dimensions: 1) professionalism, 2) game features, 3) competition, 4) information technology, and 5) spectatorship. From Table 1, we can see that no single prior definition included all five elements; rather, they typically included only two or three key elements in their descriptions (e.g., Freeman & Wohn, 2017; Schwartz, 2017). Furthermore, these extant definitions most commonly mentioned game features and competition. However, no definition completely covers these five dimensions. We discuss each element in the following paragraphs.

**Table 1. Esports Definitions**

Definitions from the literature	Pr	GF	Co	IT	Sp
"Alternative <b>sport realities</b> , that is, to <b>electronically</b> extended <b>athletes</b> in <b>digitally represented sporting worlds</b> " (Hemphill, 2005, p. 199)	†			✓	
"An area of <b>sport activities</b> in which <b>people develop and train mental or physical abilities</b> in the <b>use of information and communication technologies</b> " (Wagner, 2006, p. 3)	†			✓	
"An <b>organized</b> and <b>competitive</b> approach to <b>playing computer games</b> " (Witkowski, 2012, p. 350)	†	✓	✓	†	
An " <b>organized video game competition</b> " (Jenny et al., 2017, p. 4)	†	✓	✓	†	
"The <b>competitive</b> playing of multiplayer <b>video games</b> " (Schwartz, 2017, p. 542)		✓	✓	†	
" <b>A form of sports</b> where the primary aspects of the sport are facilitated by <b>electronic systems</b> ; the input of players and teams as well as the output of the esports system are mediated by <b>human-computer interfaces</b> " (Hamari & Sjöblom, 2017, p. 211)	†			✓	
" <b>Competitive multiplayer gaming</b> that <b>involves spectating</b> " (Freeman & Wohn, 2017, p. 1602)		✓	✓		✓
Note: Pr: professionalism, GF: game features, Co: competition, IT: information technology; Sp: spectatorship. Highlights (bold font) in the definitions reflect the key elements. † indicates that the definition pertains to a particular element, while ✓ indicates that the definition includes the particular element.					

**Professionalism**, at the macro level (i.e., structural professionalism), centers on the principles that organize professions and the institutional conditions that lead to efforts to professionalize an activity (Wilensky, 1964). For example, licensing rules for qualifying expertise, professional associations, and codes of ethics constitute the determining factors that define professional esports players. However, we do not necessarily agree that only professional gamers can play esports. Instead, we hold that amateur players also share in esports as they professionalize and play games with a professional attitude. At the individual level (i.e., attitudinal), professionalism refers to individual values, a behavioral orientation, and a belief system that advances both personal expertise (competency) and an individual's social status (Lee, 2014). Esports players' professional commitment to excellence (Pizam, 2007) and their professionalized pursuits (Seo, 2016) distinguish esports from purely casual and fun gameplay. In other words, professionalism does not apply only to professional gamers (e.g., elite players who attend top esports tournaments) but also to serious esports amateurs espouse attitudinal professionalism and engage in

professionalized pursuits (see Seo, 2016). In other words, professionalism defines esports as a profession and a “serious leisure” activity (Stebbins, 1992).

**Game features** refer to the fact the basic context of esports derives from video games (Bányai et al., 2018). For example, 18th Asia Olympic Games selected some popular video games, such as Hearthstone, League of Legends, and StarCraft, as demonstration programs for esports competition.

**Competition** refers to a contest or rivalry in which two or more parties strive for superiority or victory (Liu et al., 2013; Santhanam et al., 2016). For instance, the card game Hearthstone involves competition between two players. Another game, League of Legends, involves competition between two groups with five players each.

**Information technology (IT)** implies that IT facilitates players to perform their game operations (Hamari & Sjöblom, 2017) to respond to the changes in the virtual game environment. As an example, esports players who play iRacing need various game peripherals (e.g., controllers and output devices) or even a simulator dedicated to operating the game.

**Spectatorship** refers to the audience beyond the esports players’ gaming world who judge the player’s performance by using their socio-cultural values (Freeman & Wohn, 2017; Seo, 2016). The innovation of spectating mode makes esports become a spectator sport with a more immersive experience that attracts an increasing number of audiences worldwide.

Consequently, based on the contributions from the prior literature, we define esports in a way that contains these five key elements: esports refers to a professionalized form of organized video game competition enabled by information technologies and involving spectatorship.

## 2.2 Esports Development

In this section, we illustrate the four stages through which esports has evolved. Furthermore, we then argue that esports has not evolved in a linearly positive manner (each development stage also abides by industry lifecycle laws). Moreover, we also discuss the factors that influence esports development and how these factors facilitate the development digitally. In addition, we briefly introduce popular video games that appear in current esports tournaments. By doing so, readers can more clearly understand esports development and the esports industry’s current state.

### 2.2.1 Four Stages with Different Development Emphases

We can date relevant esports terms back to the late nineties when esports began to emerge as a popular event among young people (Schwartz, 2017). To understand how esports has evolved and help readers to learn about esports practices from a more systematic perspective, we divided its development into four stages with different signature events and developmental emphases (see Figure 1).

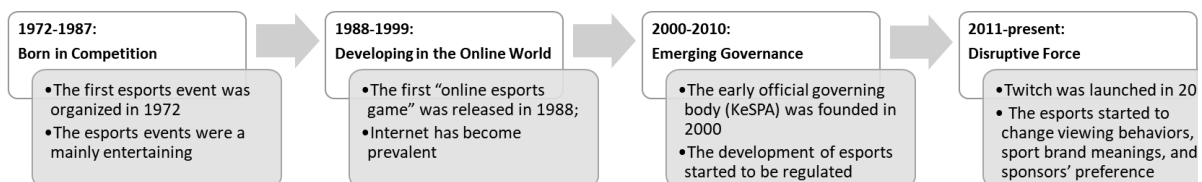


Figure 1. Signature Events and Emphases in Each Development Stage

We discuss each stage in more detail below.

**Born in competition (1972-1987):** we can regard the first esports period as beginning in 1972 with the Intergalactic Spacewar Olympics, a game competition held at Stanford University and likely the first ever esports event (Bountie Gaming, 2018). Esports during this time focused on entertainment and mainly involved arcade and console video games such as Paperboy and Donkey Kong. Television shows also began to feature video game competitions during this time.

**Developing in the online world (1988-1999):** the first “online esports game” named Netrek released in 1988 and its dedicated league named “International Netrek League” began in 1992 (Kelly, 1993). In the 1990s, commercial Internet services help to make online video games more popular, especially first

person shooters (FPS) games (e.g., Doom and Quake). Therefore, FPS games represented the most popular esports games in this stage. Some scholars also suggest that contemporary esports began to emerge at this stage (Schwartz, 2017) since most contemporary esports games rely on the Internet and local area networks.

**Emerging governance (2000-2010):** in this stage, various governing bodies (e.g., official organizations, professional tournament organizers, content providers) began participating in esports practices. The Korean eSports Association (KeSPA), which South Korea's Ministry of Culture, Sports and Tourism founded in 2000, represents one successful example. Due to supports from government policy, esports became a mainstream activity in South Korea (Jin, 2010) and also increasingly popular in Asia. In addition, Steam, a major game online publishing platform, also emerged in 2002, which further regulated the game content search and download in esports and other related fields.

**Disruptive force (2011-present):** this stage marks the disrupting force that esports began to have on the traditional sports industry from the perspective of sporting understanding, technology usage, and sponsor preference (Ke & Wagner, 2020a). During this stage, esports began to change how people understood sports brands because its virtual nature minimized obvious physical differences between individuals in many settings (Arkenberg et al., 2018), which challenges the physical strength tenet of traditional sports. Furthermore, an esports and games dedicated livestreaming website named Twitch (initially a separate section on Justin.tv founded in 2007) launched formally in 2011. Nine years later, it ranked number 34 for global Internet engagement (refer to Alexa.com), two places higher than eBay. Furthermore, livestreaming platforms shifted audience viewing habits and, thereby, challenged traditional pay television (Deloitte, 2019). In addition, more game-changing technologies such as blockchain and augmented reality technologies that helped to redefine players' game experience emerged (Newzoo, 2018; Schlegel et al., 2018; Schlegel et al., 2018). Due to its digital nature, esports content fused with these new information technologies and media in a natural and compatible manner. In addition, in this stage, esports shook up sponsors' investment preferences in traditional sports due to its digital nature, wide and high-value fan base, and stable franchised structure (Citi, 2018).

In Table 2, we summarize how esports has developed over time and identify key characteristics. We observe five facts: 1) esports has progressed through distinct phases, 2) professionalism and tournaments have become increasingly significant, 3) game types have shifted in popularity between stages, 4) sponsors' investment preferences have transitioned from traditional sports to esports, 5) efforts to broad esports content initially focused on cooperating with TV channels but, over time, have come to rely on livestreaming websites for content distribution.

**Table 2. Esports Development Summary**

Professionalism	Tournament scale*	Stage	Representative game genre	Sponsorship source	Media coverage
↓  ↓	↓  ↓	Born in competition (1972 - 1987)	Offline arcade games	Game Bar Owners, Game Manufacture	TV Show and Magazine
		Developing in the online world (1988 - 1999)	Online arcade games and first person shooters	Hardware and Software Companies	TV Show and Magazine
		Emerging governance (2000 - 2010)	First person shooters and real-time strategy	Hardware and Software Companies	Esports Dedicated TV Channels
		Professional	\$225.4M / 5069 (2019)	Disruptive force (2011 - present)	Multiplayer online battle arena

\*Tournament scale indicates the total prize money of tournaments/the total number of tournaments with data from [www.esportsearnings.com/history/2019/top\\_players](http://www.esportsearnings.com/history/2019/top_players).

### 2.3 Factors Influencing Esports' Evolution

Lifecycles exist for industries just as for products. An industry lifecycle typically comprises five phases: startup, growth, shakeout, maturity, and decline. The phases in an industry lifecycle influence firms' strategic decisions and their performance (Lumpkin & Dess, 2001). Based on the four major esports development stages, we display the change in the esports industry's prosperity over time (see Figure 2).



We show this change with an “S” curve in each stage since the industry has always managed to enter another growth phase after entering a shakeout or maturity phase. To further identify how these “S” curves formed, we identified critical events that influenced how esports has developed in each stage. In doing so, we help readers more clearly understand the esports industry’s development over time and how it has consistently broken the typical industry lifecycle (e.g., by obtaining additional growth cycles to avoid a decline).

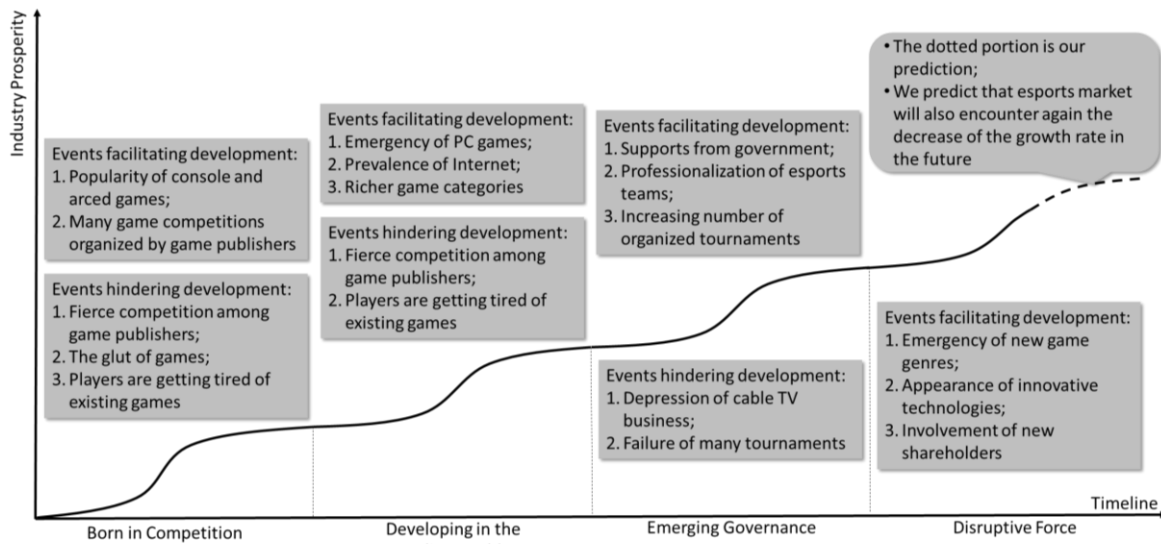


Figure 2. Esports' Development

As Figure 2 shows, developmental trends in esports have rarely remained stable or continuously upward. We discuss the events that have contributed to its development over time in Sections 2.3.1 and 2.3.2.

### 2.3.1 Positive Critical Events

Positive critical events (related to opportunities and efforts) accelerated the pace at which the esports industry has increased in prosperity. In particular, we observed four factors that have helped the esports industry succeed during its development: **technological innovation**, **game creativity**, **institutionalization**, and **approaching sport's status**. We further summarize and classify these critical events below to help readers understand the factors that have influenced the esports industry's prosperity.

First, however, we note that the esports industry's digital nature has made its development a successful sample of digital entrepreneurship. Digital entrepreneurship focuses on how both digital technologies and entrepreneurial processes interact and shape one another (von Briel et al., 2021). Thus, we further elaborate on how the four factors interact with esports' digital nature to enhance sustainability. We argue that the four factors foster resilience through “digital vitality” (continuous renewal and invigoration from digital inventions) and “digital rigidity” (the seriousness of the digital outcomes of esports). Technological innovation and game creativity have helped the esports market add new activations and overcome flat or down trends and, thus, contribute to “digital vitality”. Institutionalization and approaching sport's status have reinforced esports as a serious endeavor even if it produces “only” virtual outcomes. This seriousness has helped the esports industry cultivate “digital rigidity” and, thereby, contribute to the sustainable development of entrepreneurship.

**Technological innovation** and **game creativity** reflect the esports market's digital vitality when it faces development difficulties. Technological innovation refers to the economic function through which actors introduce new technologies in an industry (Scherer, 2001). In the esports market, technological innovation has introduced novel IT and advanced digital media applications. Amid the esports industry's rapid development, technological innovation created ongoing new opportunities for esports entrepreneurs to establish competitive positions as the sources that incumbents rely on for an advantage decayed (Baum, 2001). These new opportunities constitute the rationale for technological innovation helping esports markets to remain digitally vital and to survive the shakeout of the maturity stage. Game creativity manifests itself in how individuals and organizations creatively design new video game types or gameplay

styles. To continue holding onto players and audiences, new games and gameplay represent another important factor for how the esports industry has maintained its vigor and digital ascendance. In short, technological innovation and game creativity has helped the esports industry achieve digital vitality, an important engine for its sustainable development. From Figure 2, we observe the impact of “digital vitality” along with the development of esports. For example, nearly every round of esports development is associated with the emergence of the new video game type (Table 2 shows that a new popular video game genre emerged with each stage) and/or IT innovation (e.g., the Internet in the second stage) emerged.

Whereas technological innovation and game creativity create digital vitality, **institutionalization** and **approaching sport’s status** help esports increase “digital rigidity”. As an element that defines modern sports (Suits, 2007), institutionalization (or, in other words, stability or bureaucratization) depicts programs (Abanazir, 2019). We can see institutionalization’s influence on esports in the emerging governance stage. In this stage, we can see that official governing bodies, standardized esports leagues and players, and more high-quality tournaments emerged. This standardization regulated esports in a more traditional manner and made the results from esports competitions more serious. Due to their new seriousness and authority, esports activities may helped the esports community obtain sociopolitical legitimacy and even cognitive legitimacy (Aldrich, 1999). In turn, this legitimacy likely influenced an increasing number of participants to join esports events and helped the industry develop further. Thus, these institutionalization measures appear to have helped esports overcome a developmental decline through increased “digital rigidity”. In addition, approaching sport’s status represents an emerging factor in the esports industry’s current develop stage. In this stage, increasing supports and engagements has come from domains beyond the game industry. For instance, in the USA, the National Basketball Association (NBA) has already entered the esports domain (Youngmisuk & Wolf, 2018). In Europe, various traditional sports leagues (e.g., La Liga) have embraced esports. Not surprisingly, the global coronavirus disease of 2019 (COVID-19) pandemic has also facilitated cooperation between sports and esports (Ke & Wagner, 2020a). This apparent fusion of sports and esports has also seemingly been a reciprocal process that has facilitated the former’s digital transformation and increased the latter’s legitimacy. It has also further blurred the border between digital esports outcomes and the physical sports outcomes and, thus, further increased esports’ digital rigidity even more. Despite the significant effect that institutionalization and approaching sport’s status has had on the esports industry, we should not ignore IT’s potential to build digital rigidity. In the esports context, IT also carries institutional logic, which highlights esports events’ seriousness and authority (Gosain, 2004; Seo & Jung, 2016). For example, relevant organizations and stakeholders could use an in-game high-precision recording system and blockchain storage to ensure credible and secure outcomes from esports events (Hughes et al., 2020).

### 2.3.2 Negative Critical Events

Of course, esports development has also faced several problems and setbacks that have slowed its development. We observed three factors that have threatened the esports industry’s success during its historical development: **game fatigue** (declining consumer interest in a particular game), **market adjustment** (a change in market equilibrium or market conditions due to demand or supply changes (AmosWeb, 2020)), and **lack of experience** (the lack of operational experience to sportify esports). Fatigue results from the short-term effect that game elements or hedonism have on players’ intention to continue playing (Suh et al., 2017). That is, esports will lose its players when it features insufficient technological innovation and game creativity as we can see in the plateaus at the end of each development stage (see Figure 2). Up to now, esports has overcome this fatigue through “digital vitality” (i.e., technological innovation and game creativity). Thus, we have seen the industry relaunch popular esports games with improved game mechanics and dynamics. Furthermore, esports content previously mainly relied on the cable TV platform in its development developmental stages. However, as the television business declined (Battaglio & James, 2018), esports had to respond to the change in the market and identified a new online platform (namely, online livestreaming) for content distribution. The response to market adjustments through technological innovation demonstrates “digital vitality”. Furthermore, organizations that lack the necessary experience have caused numerous famous tournaments to fail in the esports industry’s history (e.g., World Cyber Games (WCG), Cyberathlete Professional League (CPL)). Yet, as organizations have accumulated operational experience and “digital rigidity” has grown via institutionalization and approaching sport’s status, this threat has gradually declined. Proficiency in tournament operation and the social impact derived from increased “digital rigidity” appear to have increased esports attractiveness in recent years. Combined with the support and

resources from other domains, such as traditional sports, esports has been able to digitalize the experience from these fields to further develop a new and effective entrepreneurship model.

### 2.3.3 The Popular Games in Current Esports Tournaments

Nowadays, seven different game types commonly appear in esports tournaments: 1) fighting games, 2) first-person shooters, 3) real-time strategy games, 4) sports games, 5) racing games, 6) multiplayer online battle arena games (MOBAs), and 7) collectible card games. In Table 2, we summarize the most popular games in esports tournaments. We can see that MOBAs represent the most popular game type in current esports tournaments (e.g., four MOBAs appear in the top ten list, and a MOBA, DOTA 2, appears in first place). Other popular game types include FPS games (four games in the list) and real-time strategy games (one game in the list). These popular games mostly appeared around the 2010s. Further, the game company Blizzard Entertainment created the highest number of them (StarCraft II, Overwatch, Heroes of the Storm, and Hearthstone; the company also created the strategy games StarCraft and Warcraft III, which players in the community “modded” (a popular term for modifying gaming software) to create the games that many regard as the original MOBAs (i.e., Aeon of Strife and Defense of the Ancients (DOTA)). As for professional players’ game competence, the game athletes from South Korea have enjoyed dominant status in these popular games’ esports tournaments followed by athletes from China, America, and Denmark.

**Table 3. The Most Popular Games in Esports Tournaments<sup>1</sup>**

Rank <sup>2</sup>	Game name	Game genre <sup>3</sup>	Release year	Publisher <sup>4</sup>	Contest amount	Player amount	Prize pool	Leading country (prize gained/player amount) (USD)
1	DOTA 2	MOBA	2013	BE	1367	3617	\$223.27M	China (\$64.15M/503)
2	Counter-Strike: Global Offensive	FPS	2012	VC & HPE	4903	12704	\$95.27M	Denmark (\$14.48M/444)
3	Fortnite	FPS	2017	Epic	537	3283	\$85.16M	USA (29.72M/1633)
4	League of Legends	MOBA	2009	RG	2429	6918	\$74.58M	South Korea (\$25.92M/685)
5	StarCraft II	RTS	2010	BE	5788	2033	\$32.80M	South Korea (\$20.12M/632)
6	Player Unknown’s Battle Ground	FPS	2017	PUBG	275	2583	\$21.85M	South Korea (\$5.93M/350)
7	Overwatch	FPS	2016	BE	735	3483	\$21.70M	South Korea (\$9.76M/629)
8	Hearthstone	CCG	2014	BE	864	2331	\$20.99M	China (\$3.40M/362)
9	Heroes of the Storm	MOBA	2015	BE	457	1203	\$18.15M	South Korea (\$5.78M/139)
10	Arena of Valor	MOBA	2015	TG	49	536	\$14.56M	China (\$5.02M/120)

<sup>1</sup> We collected data from [www.esportsearnings.com](http://www.esportsearnings.com) on 9 May, 2020.

<sup>2</sup> We rank the games according to their awarded prize money from the all tournaments.

<sup>3</sup> MOBA: multiplayer online battle arena, FPS: first-person shooter, RTS: real-time strategy, CCG: collectible card game.

<sup>4</sup> BE: Blizzard Entertainment, VC: Valve Corporation, HPE: Hidden Path Entertainment, RG: Riot Games, TG: Tencent Games

## 3 Research Response to the Esports Phenomenon

In Section 2, we outline the esports practice from an evolutionary perspective. In this section, we report on a literature review we conducted on esports research via quantitative and qualitative analyses to understand the research response to esports.

### 3.1 Esports Literature Search Strategy and Process

In this literature review, we focus on 1) understanding state-of-art esports studies across various disciplines and 2) summarizing how IS research on esports has evolved. To conduct our systematic literature review, we followed established guidelines (Webster & Watson 2002; Bandara et al., 2015), we applied a two-stage approach to identify and select literature (see Figure 3), which we describe in detail below. We used the data that we obtained in the first stage to explore the status quo of esports research across various fields. Next, based on that data set, we further extracted IS research papers on esports. In addition, we also manually searched top-tier IS journals (i.e., the basket of eight). Plus, we performed the backward search (i.e., screening the reference lists in the IS research papers on esports to identify additional IS research that focused on esports). By using the citation information from the Web of Science, we also did a forward search (i.e., screening the literature that cites the IS research on esports to identify additional IS research related to esports). The forward and backward search ensured that we did not miss any significant IS research on esports.

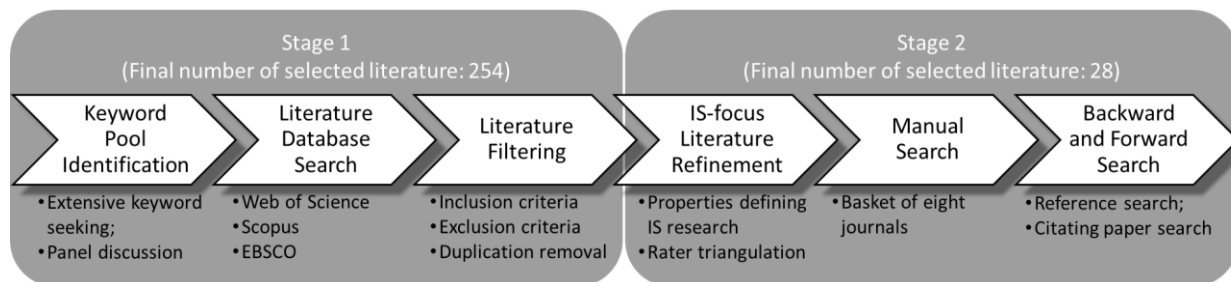


Figure 3. Literature Search and Selection Process

#### 3.1.1 Keyword Identification

To generate a keyword pool representing esports research, we took two measures to obtain a broad range of keywords and synonyms about esports topics. Firstly, as Rowley and Slack (2004) and Brocke et al. (2009) have suggested, we performed an excessive search on various materials and websites, such as highly cited esports papers, Wikipedia, and various news and social media posts, to iteratively collect the first wave of keywords related to esports. Second, based on the first wave in which we identified keywords and esports definitions, we and a doctoral candidate refined and confirmed a set of 14 keywords. These 14 keywords and their synonyms formed a sufficient keyword pool that covered a wide range of esports topics. Specifically, we identified the following 14 keywords and their synonyms: “electronic sports”, “esports”, “e-sports”, “competitive video gam\*”, “professional\* video gam\*”, “professional\* gam\*”, “cybersport”, “competitive computer gam\*”, “virtual sport”, “professional\* computer gam\*”, “competitive gam\*”, “pro gam\*”, “elite gam\*”, “organized video game competition” (“\*” is a wildcard to match variance in the keywords).

#### 3.1.2 Database Selection and Literature Search

Since we focused on understanding the status quo of esports studies in a broader context, we investigated various research disciplines through multiple available databases (Bandara et al., 2015). Thus, we conducted a systematic electronic search using three inter-disciplinary databases: Web of Science (WOS), Scopus, and EBSCO. These authoritative literature databases cover various subjects in multiple disciplines (Meho & Yang, 2007; Song et al., 2016). Many literature review papers have also relied on search results from these databases (e.g., Cheung & Thadani, 2012; Du et al., 2017; Suh & Prophet, 2018). With the identified keyword pool, we performed the keyword-based search in these three databases to extract relevant research papers based on their title, abstract, and keyword. We only extracted peer-reviewed journal papers in English. Initially, we obtained 793 publications. Subsequently, we screened and filtered them by applying inclusion and exclusion criteria (See Table 4). After filtering the publications and removing duplications, we obtained 254 esports research papers, which comprised the data set for the first stage.

Table 4. Filtering Criteria

Inclusion	I1	Publication had an empirical, technical, or theoretical focus
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criteria	I2	Publication focused on investigating esports
Exclusion criteria	E1	Esports did not pertain to the paper (e.g., it mentioned esports only in passing)
	E2	Publication was an interview or editorial

### 3.1.3 Identifying IS Research on Esports

To identify IS research on esports, we performed another round in which we filtered the literature. We began with the 254 papers that we obtained in the first stage. Following the “IS core” idea (Gray, 2003), we considered research centering on the IT artifact and/or its immediate nomological net as IS-focused research (see Benbasat & Zmud, 2003). We used this putative criterion to evaluate whether we should reasonably deem an esports study IS research (Weber, 2003). With this criterion, we initially identified 30 papers (from the 254 esports papers) as IS research on esports. Then, we also manually searched in the leading IS journals (i.e., the basket of eight (Lowry et al., 2013)). However, we found no further publications. We also performed a forward and backward search (i.e., screening the reference list in the 30 identified papers and the papers that cited those studies). From that process, we identified one additional esports publication. For triangulation, we invited two senior doctoral candidates with an IS academic background to independently check the extent to which the 31 papers pertained to the IS discipline. After checking, the two raters consistently considered three papers as lacking sufficient relevance to the IS discipline. Thus, we removed them from the sample. After the confirmation with the authors, we finally obtained 28 IS research on esports from the search process in the second stage.

## 3.2 The Performance Analysis of Esports Literature

To understand how state-of-art esports studies have developed across various research areas, we conducted a performance analysis on the 254 papers that we collected in the first stage. Performance analysis, as one important bibliometric analysis approach, displays scientific actors’ activities and their impacts to help researchers understand how certain research areas have evolved and their status (Noyons et al., 1999). In conducting this analysis, we complete the first reason we conducted our literature review: to understand state-of-art esports research activities. To display the research activities in a performance analysis, researchers usually use two measurements: publications in a particular period (e.g., Heradio et al., 2016) and the distribution of research disciplines and institutions (e.g., Dusse et al., 2016). Furthermore, researchers have usually measured research activities’ impact based on how many citations the publications gained (e.g., Du et al., 2017; Ramos-Rodríguez & Ruiz-Navarro, 2004).

In order to identify the patterns and trends in esports research activities and, thus, understand the status quo of esports research across various disciplines, we conducted a performance analysis on the esports literature that we identified in the first stage (i.e., the 254 papers we identified from WOS, Scopus, and EBSCO) from two data perspectives that researchers usually use in bibliometric analyses (e.g., Dusse et al., 2016; Heradio et al., 2016): 1) data of publications and citations and 2) data of disciplinary and regional distribution. Specifically, with the literature data set that we obtained in the first stage 1 (i.e., the bibliometric data of 254 papers retrieved from the WOS, Scopus, and EBSCO), we analyzed the annual number of publications and the number of citations to identify the research activities and the impact of these research activities (see Section 3.2.1). Furthermore, we also analyzed the bibliometric data of papers’ research disciplines and their author institutions to identify the research activity patterns from a disciplinary and spatial perspective (see Section 3.2.2).

### 3.2.1 Publications and Citations

In this section, we analyze the papers in our sample from the first stage based on their publication year and how many citations they attracted (note that, for data accessibility and consistency, we report on publication and citation information for 193 esports papers that the WOS indexed rather than all 254 papers). After checking each paper’s publication date, we found that the earliest esports publication appeared in 2005 (i.e., Hemphill, 2005). Notably, the publication and citation counts remained flat before 2014. After 2014, the increase in both became significant. In 2020, around 80 publications appeared with over 480 citations, which reflects growing interest in esports research after 2015.

To further explore the extent to which esports research has grown, we conducted a regression analysis with publication and citation data for the 2011 to 2020 decade. We conducted regression analyses with both exponential curve and linear curve fitting based on the publication and citation data. We observed two separate patterns (see Figure 4): 1) the number of publications, judged according to  $R^2$ , grew in a

linear pattern ( $R^2 = 0.8086$  (linear) vs.  $R^2 = 0.7329$  (exponential)), while the number of citations grew exponentially ( $R^2 = 0.9171$  (exponential) vs.  $0.7602$  (linear)).

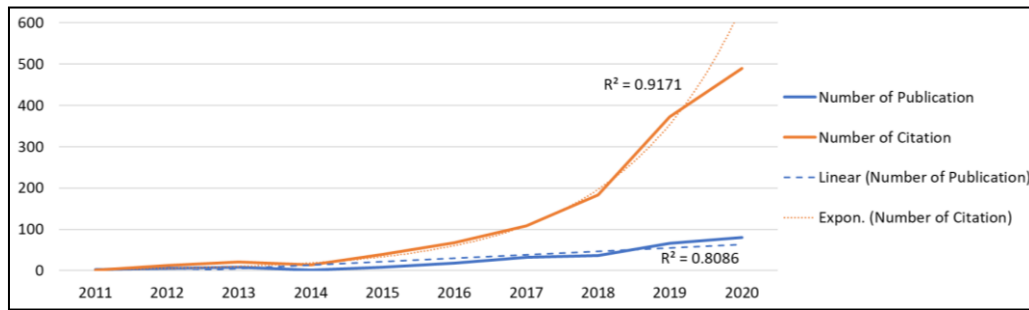


Figure 4. Regression Analysis of Numbers of Publications and Citations (2011-2020)

This exponential growth trend for citations reflects rapidly growing research interest in esports during the 2011-2020 decade. Nevertheless, esports research remains small in volume (Hamari & Sjöblom, 2017; Reitman et al., 2019), which constrains its influence.

### 3.2.2 Research Area and Regional Distribution

In this section, we analyze all 254 papers that we retrieved from the WOS, Scopus, and EBSCO databases in the first stage based on their research discipline and regional distribution. We identified the papers' research area based on their bibliometric data and our manual summary; we show research disciplines with more than five publications in Figure 5. We found that the leisure and sports discipline commanded the most research papers (60 publications) followed by law (44 publications) and communication (43 publications). In contrast, the IS research discipline (which the 28 papers that we identified in the second stage represent) ranked seventh. As for the regional distribution, we found that researchers from at least 12 different research disciplines have contributed to esports research. This facilitates the cross-disciplinary development of esports research and should help esports to attract attention of scholars from a wide range of fields. With the inter-disciplinary nature of IS research (Webster & Watson, 2002), we expect that IS research will expand in the future and further facilitate cross-disciplinary esports research.

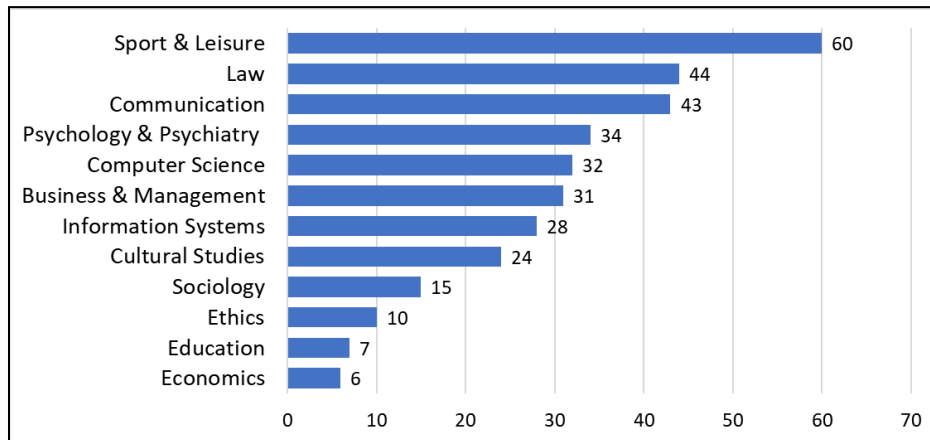


Figure 5. Discipline Distribution

To learn about the leading esports research regions and the extent to which esports research has spread throughout the world (Dusse et al., 2016), we next identified the countries in which researchers have conducted esports research based on their institutional affiliation. We found that 1) the USA leads the world in esports research volume (113 papers) and 2) South Korea leads Asian countries for esports research volume. To some extent, these findings concur with the fact that esports originated from the USA (Schwartz, 2017) and support the argument that Eastern esports activities started in South Korea (Wagner, 2006). These locations also enjoy active and rapid research development. Our analysis also confirms that the countries in North America, Europe, and Asia have most actively conducted esports

research. The modest number of esports research contributions from other countries implies that, globally, esports research still needs further development.

### 3.2.3 Information Systems Literature of Esports

The definition of esports emphasizes that information systems and technologies have an important role in esports. Thus, for IS researchers, we further review and summarize the esports studies related to IS concerns. As we mention in Section 3.1.3, 28 papers in our collection effort related to IS research interests.

We extracted eight research topics from these 28 IS studies (see Table 5): 1) esports gameplay intention (three papers), 2) esports gameplay performance (two papers), 3) esports spectating (six papers), 4) esports gambling (two papers), 5) networking esports individual behaviors (nine papers), 6) digital design of the esports experience (two papers) and (g) commerce analysis on esports individuals (three papers), and 8) esports team behaviors (one paper).

**Table 5. IS Research on Esports based on Topic**

Research topics	Paper focus	Relevant references
1) Esports gameplay intentions	Antecedences of esports gameplay behaviors	Jang & Byon (2020), Martoncik (2015), Weiss & Schiele (2013)
2) Esports gameplay performance	Information analysis of esports gameplay performance	Afonso et al. (2019) and Xia et al. (2017)
3) Esports spectating	Why people watch esports	Brown et al. (2018), Hamari & Sjoblom (2017), Qian et al. (2020a, 2020b), Sjöblom et al. (2020), Xiao (2020)
4) Esports gambling	Antecedents of esports gambling behaviors	Macey et al.(2020a) and Macey and Hamari (2019)
5) Networking esports individual behaviors	Building up the relationship among different esports related behaviors	Egliston (2020, 2019), Jang & Byon (2019), Jang et al. (2020), Macey & Hamari (2018), Macey et al. (2020b), Matsui et al. (2020), Tang et al. (2020), Wohn & Freeman (2020)
6) Digital design of the esports experience	Game balance design and digital spectating experience design	Bosc et al. (2017), Stahlke et al. (2018)
7) Commerce analysis on Esports individuals	Esports ads, fan loyalty, and esports product analysis	Ji & Hanna (2020), Kordyaka et al. (2020), Seo et al. (2018)
8) Esports team behaviors	Team behaviors in the esports competition context	Freeman & Wohn (2019)

These topics suggest that current IS research on esports mainly centers on individual behaviors (such as gaming intention, gaming performance, spectating behaviors, and gambling behaviors) and the relationships between them. In addition, we also found 27 publications connected to other individual-level topics: the design aspects related to the esports experience and the commercial factors related to esports individuals. In contrast, we found only one study at the organizational level, which focused on team-level behaviors in esports competitions (i.e., Freeman & Wohn, 2019).

After reviewing the relevant IS literature, we found that many IS esports studies had an exploratory or data-driven nature except studies on esports gameplay intentions and esports spectating (which mostly drew on theoretical foundations). Notably, these theory-driven studies mostly only tested existing theories in the esports context. We believe, however, that IS researchers must make other contributions to developing esports research beyond testing or simply contextualizing extant theories. Thus, IS researchers have significant space to contribute to theoretically developing esports.

We note IS research on esports is current and ongoing with 25 of 28 reviewed studies having been published since 2018. When identifying these 28 journal papers, we also cared about whether the Senior Scholars' basket of eight top-tier IS journals published any. Interestingly, we found that none appeared in these leading IS journals, whereas related topics such as hedonic information systems (Van der Heijden, 2004) and gamification (Suh et al., 2017) have already found their way into the top IS journals (e.g., *MISQ*

and *JMIS*). To some extent, hedonic IS and gamification represent precursors to esports due to the development base and basic context.

## 4 IS Research Framework on Esports

In this section, to display the wider landscape and explore broader opportunities for IS research on esports, we provide comprehensive research framework to call for more and diverse attention from the IS community. Inspired by Hevner et al.'s (2004) IS research framework and theory-context-method structure (Paul et al., 2017), we propose an IS research framework for esports that comprises three critical parts: 1) the IS components of esports, 2) extant research streams and knowledge base, and 3) research avenues for IS scholars. We present the framework in Figure 6.

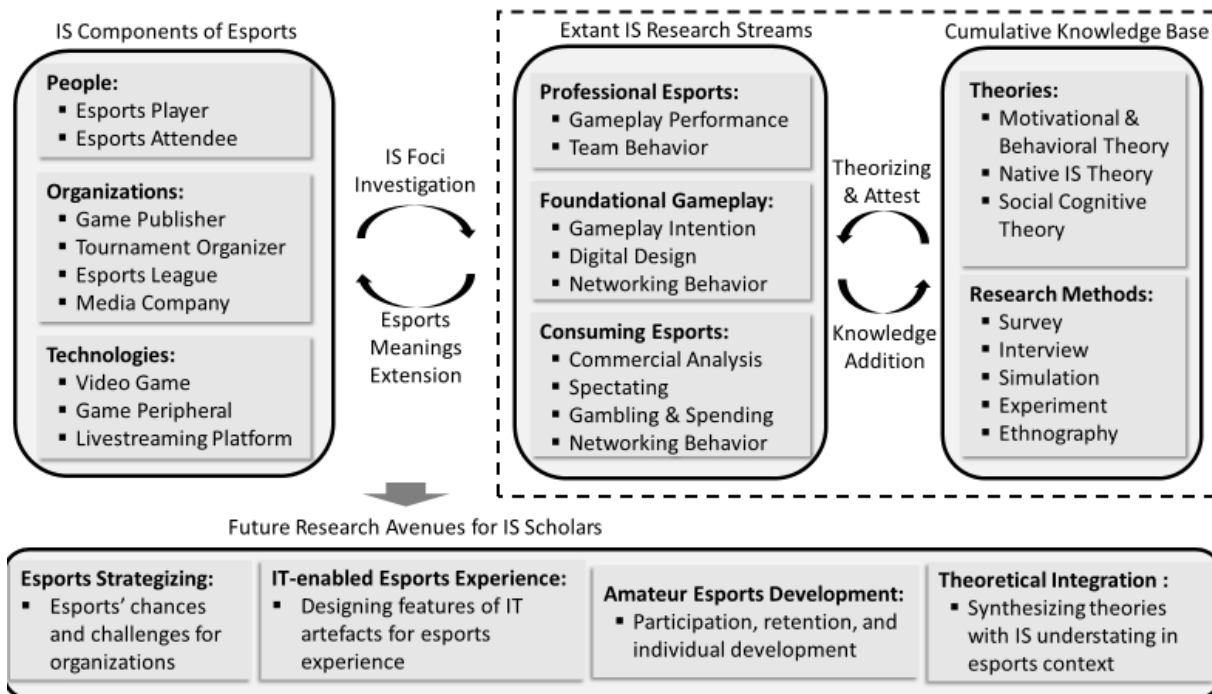


Figure 6. IS Research Framework on Esports

### 4.1 IS Components of Esports

The environment defines the problem space (Simon, 1996) where esports resides. Silver et al. (1995) suggest that people, (business) organizations, and technologies constitute the components that comprise IS research's general environment. Together, these components define problems as IS researchers perceive them (Hevner et al., 2004). In this case, the IS research on esports is also supposed to happen in an environment composed of specific people, organizational, and technological components. Thus, we deem that the IS components of esports involve people, organizations, and technologies.

In Figure 6, we highlight two user roles (people component): esports players and esports attendees. Esports players represent the key actors who participate in professionalized gaming. Professionalized gaming, in contrast to regular gaming, involves certain professionalism as players compete by playing games in tournaments for honor, self-improvement, and/or money (Faust et al., 2013; Wagner, 2006). Professionalized gaming constitutes esports' foundation because the ethos (e.g., self-growth and skill development) and professionalism embedded in such gaming activities distinguish them from leisure activities (Lee, 2014; Seo & Jung, 2016). Many studies (e.g., Martoncik, 2015; Seo, 2016) have consistently found that esports players play for serious pursuits or self-achievement rather than leisure needs or fun. Additionally, our framework includes some peripheral individual roles, such as esports viewers (Hilvert-Bruce et al., 2018) and esports gamblers (Macey et al., 2020a), in the framework. As for the organizational component, we highlight four sectors: game developers/publishers, tournament organizers, esports leagues, and media companies (e.g., livestreaming service providers). These four sectors jointly facilitate efforts to develop esports (Jonasson & Thiborg, 2010, Ke & Wagner, 2020a). We



also hold that organizations in these four sectors represent core esports organizations that successfully inaugurated contemporary esports. For example, game publishers release popular esports games for esports competition. Tournament organizers operate esports events for esports leagues. Esports leagues produce competitive content for the audience. Media companies broadcast this content to online esports fans for the wider content distribution. With regard to the IT component, we focus on the IT relevant to video gameplay and spectating because these two behaviors represent the important and most common consumption behaviors in esports context. Specifically, we highlight three types of IT related to these two behaviors in the framework: video games, game peripherals, and livestreaming platforms.

We hold that these components “define” esports in an IS manner. In this case, we suggest that IS researchers who want to conduct the IS research on esports should bear these components in mind since they would help IS researchers investigate the esports phenomena from an IS perspective. Also, these components will assist IS scholars to explore the esports phenomena with specific IS interests.

## 4.2 Extant Research Streams and Knowledge Base

Based on findings from our literature review on IS research on esports, our research framework further summarizes the extant research streams and knowledge base (theories and research methods). It lists three research streams in the IS research on esports: professional esports, foundational gameplay, and consuming esports. These three research streams reflect the fine-sorted context of esports. professional esports stream mainly focuses on professional players who play esports as a formal occupation. In contrast, the foundational gameplay research stream considers casual players, which constitute the foundation for esports’ development (Sotiriadou et al., 2008). The third research stream consuming esports focuses on consumption activities related to esports, such as the viewing content (e.g., Wohn & Freeman, 2020) and spending money on esports (e.g., Macey et al., 2020a). We can categorize the eight research topics that we identified in our literature review into these three research streams, and we display their relationships with these three research streams in the research framework. The research topic “networking esports individual behaviors” falls into two research streams because some studies connect the esports gaming behavior (foundational gameplay) to esports spending and others connect it to viewing behaviors (consuming esports) (e.g., Jang et al., 2020; Macey et al., 2020b).

The knowledge base supports the development of these three IS research streams on esports. Drawn on the current theory-driven IS research on esports, we identify three theoretical sources: motivational and behavioral theories (e.g., use and gratification theory that Brown et al. (2018) applied and the theory of reasoned action that Xiao (2020) applied), native IS theories (e.g., unified theory of acceptance and use of technology that Jang and Byon (2020) applied), and social cognitive theories (e.g., self-determination theory that Qian et al. (2020) applied). The framework also displays the common research methods that the IS research on esports has used. We observe that IS research on esports has used both quantitative and qualitative research methods. Among them, we found the online survey as the most popular (e.g., Jang & Byon, 2020; Sjöblom & Hamari, 2018). The extant IS research streams and knowledge base appearing in esports studies helpfully explain what IS components and their theorized relationships mean in an esports context.

## 4.3 Promising Research Avenues Suggestion: An Agenda

In this research framework, we proposed four general research avenues (GRAs) as a research agenda to help researchers conceive specific IS research on esports. Besides extant IS research streams (see Figure 6), these additional four GRAs serve as the new and valuable outlets expanding the IS research scope on esports. In this section, we illustrate sample research questions to that each GRA could address.

### 4.3.1 Esports Strategizing

Few studies have focused on esports with an organizational focus. While esports enjoy significant popularity and have immense business potential, the specific (strategic) value (e.g., business potential) for different organizations in the esports context remains vague since we lack relevant IS research. An inevitable problem for these esports related organizations (as Figure 6 shows) arises from their engagement in esports entrepreneurship: what specific (strategic) value does esports have for their business development or entrepreneurship? In other words, why would companies enter the esports arena? To help the organizations uncover esports’ (strategic) value, we direct researchers to conduct research in the organizational dimension. Thus, following the idea of IS strategizing for organizational

development (Marabelli & Galliers, 2017), we propose a research avenue named “esports strategizing” to call for more research on opportunities and challenges associated with esports for organizations. For example, researchers could examine:

- 1) What specific benefits or challenges arise for traditional sport organizations when they extend/transform their business into the esports domain (e.g., establish an esports league)?
- 2) What would be the pros and cons for game publishers to engage in esports versus other gaming (e.g., Nintendo focuses on hedonic gaming, while Blizzard and Valve embrace esports)?

This research orientation details our understanding of benefits and challenges for esports-related organizations.

#### 4.3.2 IT-enabled Esports Experience

Advancements in IT account for the esports’ rapid development (Wagner, 2006). Video games, game peripherals, and media platforms constitute the three main forms of IT that empower the esports experience. One can easily find video game-related research in the IS domain, but such research mostly focuses on game-related features (e.g., Suh & Wagner, 2017) or people’s behaviors in hedonic video games (e.g., Putzke et al., 2010). However, we lack video game research in the esports context. Furthermore, because esports players predominantly focus on gaming as a professional pursuit (Seo, 2016), the game peripherals helping them become more professional/professionalized also constitute important technologies in the esports domain (Ke & Wagner, 2019, 2020b). As for the media platforms for esports, livestreaming platforms have an important role in broadcasting esports tournaments. These IT artefacts help esports participants (i.e., esports players and esports attendees) obtain a better esports experience. However, in our literature review, we also found little IS research on this topic (based on Table 5, only two papers explored design aspects related to esports). As such, research lacks a clear rationale for companies (e.g., game studios) to design video games and relevant IT that would work well in esports. Thus, we propose a general research avenue named IT-enabled esports experience to call for more research (from a design perspective) on IT artefacts and esports experience: *designing IT artefacts in a way that facilitates users’ esports experience*. For example, researchers could examine:

- 1) How should one design game mechanics that speak to professional players and the leisure gamer community
- 2) How should one design the spectating mode for virtual reality (VR)-supported esports to help viewers enjoy the experience?
- 3) What unique demands and logics would arise when designing IT specifically for esports competitions (Xiao et al., 2017)?

This research orientation would help the IS discipline accumulate the IT design knowledge and guideline for game publishers and/or other organizations to promote esports activities, such as gaming, livestreaming, spectating, and so on.

#### 4.3.3 Amateur Esports Development

The research streams that we summarize in this study center on professional esports and casual esports gameplay. However, based on the sport development model (Green, 2005) and sport development process (Sotiriadou et al., 2008), we identified a gap between professional esports and casual esports gameplay: amateur esports. In amateur esports, grassroots players (e.g., mass/casual gamers) attend organized esports competitions as players but not as professionals. These organized amateurs represent the backbone of traditional sports in many countries, such as the Germany, where 7.1 million soccer amateur players participate in over 24,500 clubs (Deutscher Fussball-Bund, n.d.). In contrast, organized amateur esports essentially does not become popular. Hence, we believe that amateur esports would be an important research avenue for future IS research on esports since it represents a key area to sustainably develop the esports market (Niko, 2019). In 2020, Microsoft acquired an online amateur esports platform (Smash.gg) (Luongo, 2020). In 2021, Tencent released the “esports for all” strategy for its popular mobile esports game Arena of Valor (Yajie, 2021). In the United Kingdom, Intel has focused on developing amateur esports (Wells, 2019). These firms’ strategic actions also signal the important role that amateur esports will play in esports’ future development. However, researchers have paid limited attention to this promising esports form. In this case, we fail to understand why grassroots players enter

competitions and their retention and progression in the amateur esports context. Thus, we advocate a research avenue called amateur esports development. For example, researchers could examine:

- 1) What IS-related factors motivate casual gamers to transfer from casual gameplay to amateur esports competition?
- 2) What IS-related factors make people continue to participate in amateur esports?

We do not have answers to these questions. In addition, amateur esports represents a platform for gamers to experience serious and career-like competitions (Seo & Jung, 2016). Thus, amateur esports research potentially reveals esports' "meaningful value" for individuals' development, such as the esports ethos (Seo, 2016) and sport commitment (Scanlan et al., 2016). The search for answers to these questions may also motivate researchers to explore amateur esports' positive effects, such as whether participating in amateur esports competitions reduces game-addiction behaviors. Furthermore, we also know little about the roles that amateur esports plays in individuals' development. Thus, more amateur esports research would be beneficial to esports sustainability and help explain its specific value for individuals' development.

#### 4.3.4 Theoretical Integration

In this overview, we use theory broadly to refer to conjectures, models, frameworks, or entire bodies of knowledge (Gregor, 2006). Theory constitutes the scholarly realm's currency (Corley & Gioia, 2011). The applicable theoretical thought and the theoretical development in esports research would be beneficial for researchers to select a suitable epistemological approach to insightfully understand the phenomenon and advance our knowledge (Gregor, 2006; Hambrick, 2007). However, from our literature review, we found that researchers have conducted little theory-driven esports research. Moreover, esports research that has adopted a theory-driven approach has predominantly only contextualized and tested existing theories. This finding points to deficiencies in the theoretical contributions and innovations that IS research on esports has made. Because a systematic approach for empirical research begins with establishing a theoretical foundation (Flynn et al., 1990), we recommend empirical IS researchers to consider the role that theory plays in the IS research on esports. As esports is a transdisciplinary phenomenon (i.e., it combines sports, leisure, and IT use) (Bertschy et al., 2020), one effective approach that IS research could take to develop theory on esports would involve theoretically integrating different theories from multiple areas. Thus, we suggest theoretical integration as a research avenue: synthesizing theories from multiple disciplines with IS understanding in esports research. Such a synthesis should not simply combine or duplicate theories in the esports context. Rather, researchers should organically blend theories alongside deeply comprehending the esports context and IS interest. To do so, researchers need to recognize esports' specific contextual distinctiveness at the theoretical level (Xiao et al., 2017). For example, researchers could examine:

- 1) How can we identify and reconcile the difference between sports commitment (as a form of commitment to an activity) (Scanlan et al., 2016) and commitment to IT (as a form of commitment to an object) (Xiao et al., 2020) to better understand commitment behaviors in the esports context?

As a new and unique phenomenon, esports offers a broad opportunity for researchers to re-structure and/or extend the traditional theories and constructs, which may lead to significant theoretical contributions to the IS community and even more extensive areas.

## 5 Discussion and Conclusion

### 5.1 IS Research Contributions to the Esports Realm

In this study, we propose an IS research framework for esports. Based on the framework, we recognize esports as a novel phenomenon that deserves added attention from IS scholars since they focus on esports' main constituents: people, (business) organizations, and technologies (Lee, 1999). Drawing on the insights from the literature review, we acknowledge that researchers in several disciplines have investigated esports as an emerging topic (see Figure 5). This insight raises a further question: what "signature contribution" can IS research make to esports given the efforts in other disciplines? Although the proposed framework implies the relevance of IS research on esports, the specific IS research contributions should also be highlighted.

We argue that IS research can contribute to esports investigations via significantly expanding esports ontology. We have seen many studies from referent disciplines examine esports based on different ontological perspectives. Specifically, scholars from the sports and leisure discipline have investigated esports phenomena more than scholars from any other discipline. They typically regard esports as a sport or leisure activity (e.g., Hallmann & Giel, 2018). Communication studies and cultural studies define esports as playful media (or a gaming phenomenon) and mainly explore its cultural and social meanings (e.g., Taylor & Stout, 2020; Seo & Jung, 2016). Due to these studies' current dominance and their underlying ontology, people usually constrain esports to sports or game media or to being synonymous with a more generic entity (such as innovation, newness, or digitalization). However, the IS community could add a third dimension to existing esports ontology; that is, esports as an IT usage activity. IS researchers can highlight the IS nuance in esports by investigating IT-related behaviors and IT-related constructs at the individual or organizational levels (Benbasat & Zmud, 2003). Such an approach would explain esports phenomena in a new way that would reflect the IS discipline (Niederman et al., 2015). Thus, with IS research's involvement, the esports research space should have three basic entities: sports, game media, and IT usage activities.

Furthermore, we believe that IS research on esports would reciprocally benefit other research with sports- or gaming-related ontological views. IS research would facilitate the "digital first" epistemology (Baskerville et al., 2020) for developing esports research and practice. For example, IS research on esports would benefit sports research on digital transformation and digital entrepreneurship (von Briel et al., 2021) because sports researchers can learn about IT's value. Accordingly, sports researchers could better appreciate IT use's significance. For playful media research, the added IS perspective could help them understand esports' cultural significance, which could help game studies merge cultural and IT understanding. For example, IT usage may reflect or facilitate the esports ethos as an important cultural phenomenon (Seo, 2016). We believe that the addition of the IS research view would also enlarge the research space for scholars with an interest in the specific esports elements or features. From the literature review, we found that psychology, education, or business could also pertain to esports research. Related studies may not view esports in a consistent basic way (such as sports, game media, or IT usage activities) but focus on specific scenarios or applications in the esports context. IS research could highlight the digital dimension in esports and, thus, enrich esports research's theoretical foundation. With its interdisciplinary nature (Webster & Watson, 2002), IS research may also be the "glue" in communicating knowledge generated from different referent disciplines and, thus, help organize esports studies into a more structured and cohesive body of knowledge.

## 5.2 Conclusion

We conducted this study to overview esports in order to heighten awareness and attention towards this emerging form of online play, sports, and business. In this study, we extensively reveal the esports landscape from the practical and scholarly perspective. With this study, we hope to facilitate researchers to further develop esports research, especially in the IS community.

First, we provide systematic background knowledge about esports for readers and especially for IS scholars. As an emerging and rapidly developing area, researchers require such background knowledge to well and truly capture esports-relevant phenomena. However, extant research has not systematically presented esports basic knowledge. Thus, we fill that gap in this study by comprehensively defining esports and analyzing how esports has developed over time. In this way, we help researchers more clearly understand esports and distinguish it from other seemingly similar contexts such as hedonic gameplay.

Second, we reviewed the existing literature via a two-stage process. Our findings can help researchers understand state-of-art esports research and the topics that such research has examined. With these identified research topics, our review serves as a reference for future IS research on esports by implicating potential investigation gaps. To further help researchers develop IS research on esports, we propose an IS research framework on esports with four promising research avenues. While we do not exhaustively list all such research avenues with the four we present, we believe that these they can help researchers better understand relevant esports phenomena and even shape the esports future substantially. Beyond these avenues, future IS research can also use our framework as an essential guideline to identify and investigate concrete IS questions in the esports context.

As esports has grown in popularity among its audience and casual players, we anticipate that amateur esports—where casual gamers (e.g., through clubs) participate in esports competitions as organized

players—will drive esports' development next. Thus, as one potential research avenue, we call for more IS research on amateur esports. Furthermore, many companies (e.g., Tencent) have initiated the “esports for all” strategy to develop amateur esports, which implies that the esports development structure would more closely resemble a pyramid model (casual gamers as the base, amateur esports players in the middle layer, and professional players at the peak), a general model for sports development (Green, 2005). Based on the sports industry, we believe that amateur esports would make the esports industry more sustainable and could also exert its positive values more widely and enduringly.

For the esports industry to develop sustainably, information technology, almost by definition, appears indispensable. Consequently, more IS research on esports, should help researchers more profoundly understand what IT and digitalization means and their impact on esports development. Therefore, we call on IS researchers to explore the esports phenomenon as a research topic and to provide advice for sustainable success and societal benefit.

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## About the Authors

**Xiaobo Ke** is PhD Candidate at the City University of Hong Kong. His current research focuses on IS phenomena of esports, gamification, and playable media. His work has appeared in several international journals and conferences, such as *Internet Research*, *Industrial Management & Data Systems*, *Managing Sport and Leisure*, *Pacific Asia Conference on Information Systems*, *International Conference on Human-Computer Interaction*, etc.

**Christian Wagner** is Chair Professor of Social Media and Provost at the City University of Hong Kong. He has authored or co-authored over 150 publications during the last 30 years, exploring the role of information systems in problem solving, creativity, and gaming. Wagner believes that the most interesting research is the study of discontinuities and the explanation of apparent paradoxes.

**Helen S. Du** is Professor and Head of the department of Electronic Commerce at Guangdong University of Technology. She received her PhD from the City University of Hong Kong, department of Information Systems. Her research interests include electronic (and mobile) commerce, digital media and business innovation issues in information systems. She has published over 50 publications in leading journals and international conferences, such as *Journal of the Association for Information Science and Technology*, *International Journal of Human-Computer Studies*, *Decision Support Systems*, *Internet Research*, among others.

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