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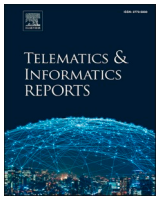

Unravelling the complexity of the Video Game Industry: An integrative framework and future research directions

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ABSTRACT

The Video Game Industry (VGI) is a highly innovative and rapidly growing sector that has become the dominant force in the entertainment industry, with significant economic and social implications. Despite the increasing attention that scholars and practitioners have paid to the VGI, the literature remains fragmented and lacks a coherent framework for understanding its complex nature and underlying dynamics. To address this gap, this study provides a comprehensive review of the extant VGI research, focusing on the business and management perspective this industry, and synthesizes the key components and concepts into an integrative evidence-based framework. Drawing on a sample of 84 articles published over the last 15 years in leading business and management journals, our framework maps the key elements of the VGI literature and establishes their conceptual relationships. Additionally, we identify critical gaps in the VGI research and suggest future research trajectories to guide scholars in advancing the field. Furthermore, we offer a set of practical implications for managers based on our findings. By providing a systematic and holistic understanding of the VGI, this study contributes to the development of a more comprehensive and nuanced perspective on this important and dynamic industry.

1. Introduction

The Video Game Industry (VGI) first emerged in the 1970s and 1980s, predominantly distributing its products through arcades [1] and had relatively humble beginnings [2]. However, since then, the industry has evolved into the largest and fastest growing sector in the entertainment industry, eclipsing both the film and music industries [3]. It is expected to surpass a value of US$ 521 bn by 2027 [4]. Clearly it is an industry which warrants detailed and systematic study. However, due to its rapidly evolving nature, the VGI has drastically transformed, in various ways, since its growth in the late 1990s and early 2000s due to the rise of emerging technologies [5]. This, at least in part, is due to the increasing prevalence of home systems such as Nintendo's N64 and Sony's PlayStation, as opposed to public arcade systems [6]. These systems came into mass adoption throughout the new millennium and represent the first paradigm shift in the industry. However, it was with the introduction of the iPhone and the subsequent explosion of the smartphone, coupled with the development of "Two-Sided" console platforms, that VGI in its current form emerged [7,8]. It has become so significant that nearly 40 % of the global population spends at least some of their leisure time gaming [9].

Whilst some of the literature on other entertainment fields (e.g., music and film production), and business fields more generally [10], can have implications for the VGI, there are numerous unique characteristics to this industry that highlight its idiosyncrasy. Importantly, the VGI is *fast-changing* (constantly evolving and adapting to new technologies, such as advances in graphics and gameplay mechanics), *interactive* (games allow players to interact with the game world and make choices); *immersive* (most games are designed to offer immersive experiences; allowing players to be part of the game world); *global reach* (VGI is a global industry, with games being played globally); *impact culture* (have had a significant cultural impact, influencing art, music, and other aspects of popular culture); *enables social interaction* (allow players to interact with one another online, creating a sense of community) [10–14].

Accordingly, driven by the sheer size of this industry, its uniqueness, and its socioeconomic impact on society, there was an increasing academic engagement in the VGI field. As such, the number of publications

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on VGI has significantly increased in recent years and already outnumbers that of previous decades (as illustrated in this paper's findings, see Fig. 2). However, reviewing these publications shows some key gaps. Importantly, it is noticeable that this body of literature is largely fragmented, often across multiple disciplines, from behavioural psychology to innovation management. For example, both the unique impact that video games have on human psychology and modelling the distinct nature of novel monetization strategies in the VGI, are addressed separately within the scope of the VGI literature. However, because they are both central concerns of the VGI, they can logically be synthesized to find linkages which can provide insights applicable to the field as a whole. As demonstrated in this paper, unifying areas of the field, such as this example, have revealed important practical and social implications. Understanding and consolidating the research in this relatively imprecise field is a key concern of this paper. In fact, there is only one study, Marchand & Hennig-Thurau [15], that sought to devise a conceptual framework for analyzing the VGI. However, that study is ten years old (thus missing the massive development in this field), and was not conducted using a systematic approach that comprehensively accounts for all related literature (e.g., some articles written before 2013 are included in our study, but not in Marchand & Hennig-Thurau's [15] work).

This study seeks to address the aforementioned issues by answering three key research questions: (1) Within the business and management domain, what is the state of empirical research on the VGI? (2) what are the key themes in this industry, and how these themes are conceptually connected? (3) What are the key findings of this piece and what are the implications going forward?

To answer these questions, we adopted a Systematic Literature Review (SLR) procedure [16] by collecting, analyzing, and consolidating findings from 84 empirical articles published between 2007 and 2022 in leading business management journals

Overall, our study offers several key contributions. *First*, we offer a unique and comprehensive view of VGI literature focusing on the business and management perspective, and offer an evidence-based framework for this unique industry and its related dimensions. While linkages between single VGI elements were until recently addressed predominantly from a bilateral detailed perspective of the relationships (e.g., examining the relationship between product ecosystem and monetization strategies), we show the full breadth of the VGI in the business literature. Accordingly, we respond to calls in the literature that identified that need to investigate how the various factors in this industry (e.g., customer psychology, monetization strategies, business model innovation) interact [10,17,18]. Most fundamental among these relationships, we explicate the complexity of video game innovation. While several studies have examined this important dimension of VGI (i.e., the video game innovation), we map the simultaneous effect of multiple factors (and their underpinning sub-themes) including user experience, product development, and location (i.e., institutional settings).

Second, in addition to mapping out the meta-landscape of the VGI, this study has delineated the key fields of interest captured by the sample. These are the study of product ecosystems and complementary goods; the study of the unique novel pricing strategies available to the VGI; the study of VG user behaviour as well as consumer psychology; the optimisation of innovation networks in the VGI; the overall survivability/sustainability of VGI business models. We construed the constituent elements of the interactions between the elements of these factors and has devised a framework for broadly understanding the key areas of the field, as well as identifying critical gaps in the research. *Finally*, we draw on the emerged insights from our analysis of the empirical literature on the VGI, as well as, the developed framework to identify key gaps in this stream of research, and document key areas for future research. In doing so, we suggest novel research avenues by the cross-fertilization of research along with greater contextualization, theoretical integration, and geographic coverage to revitalize this important area of research.

2. The VGI: a historical perspective

The VGI has embarked on a remarkable and transformative journey since its inception, reshaping the realms of entertainment and technology, see Appendix A. This progression is punctuated by pivotal milestones, each marking distinct stages in the industry's evolution. Every phase has played a crucial role in shaping the VGI, influencing both players and consumers, and weaving a rich tapestry of experiences.

The nascent era of the Video Game Industry traces its origins back to the 1950s and 1960s, when trailblazers like William Higinbotham and Ralph Baer laid the foundation for interactive electronic games [19]. These innovators paved the way for forthcoming breakthroughs. Subsequently, the emergence of arcade games during the early 1970s served as a turning point in popularizing video games. Notably, the release of Pong in 1972 captured the imagination of the public, heralding the dawn of the arcade era [19]. This phenomenon ignited a cultural fascination, captivating players with its elegantly simple yet highly addictive gameplay.

The late 1970s and early 1980s bore witness to the rise of the home console era, revolutionizing the industry. In 1977, the Atari 2600 took gaming into households on a grand scale, granting individuals unprecedented access [20]. However, this period was marred by the "Atari shock," a seismic event that rocked the U.S. Video Game Industry, resulting in a market crash and industry-wide turmoil [21,22]. In the wake of this crisis, Nintendo's NES, released subsequently, not only revived the industry but also cemented the concept of home gaming consoles. It offered immersive experiences and introduced iconic characters such as Super Mario, reinstating faith in video games [20]. Coinciding with this, the ascent of personal computers (PCs) during the 1980s opened new vistas for game development and distribution. PC gaming gained momentum with influential titles like Doom and Myst, showcasing the potency and versatility of computer-based gaming [23]. This era fostered the growth of a passionate PC gaming community, driven by the flexibility and customization that PCs offered [24].

Advancements in technology propelled the VGI into a new dimension. The incorporation of 3D graphics, enhanced sound capabilities, and augmented processing power revolutionized the gaming experience. Consoles like Sony's PlayStation and Nintendo's N64 stood as testament to these breakthroughs, expanding the industry's reach to broader audiences [25].

The late 1990s and early 2000s saw a seismic shift with the advent of online gaming. The ubiquity of internet connectivity enabled players to engage in multiplayer experiences and establish virtual communities. Massively multiplayer online games (MMOs) like EverQuest and World of Warcraft gained monumental popularity, fostering social interactions and collaborative gameplay [26].

The rise of mobile gaming marked yet another milestone in the VGI's saga. The debut of smartphones, notably the iPhone in 2007, reshaped how games were consumed. Mobile gaming surged, offering accessible and casual experiences to a diverse user base [27].

As technology continues to surge forward, the VGI ventures into uncharted territories. Virtual reality (VR) and augmented reality (AR) have emerged as transformative technologies, ushering in immersive and interactive gaming experiences. Cloud gaming services have gained traction, allowing games to be streamed over the internet without the need for high-end hardware. Furthermore, the ascent of eSports has fundamentally altered the industry landscape, with major tournaments and professional players captivating massive audiences, underscoring the competitive and lucrative nature of eSports [28].

Reflecting on these trajectories, it becomes evident that the VGI's history epitomizes its dynamic and ever-evolving essence. From humble beginnings to the present day, the industry relentlessly pushes boundaries and embraces technological strides to deliver captivating and immersive gaming experiences. Each milestone, from arcade games to home consoles, online gaming, mobile revolutions, and the advent of transformative technologies like VR and AR, has indelibly shaped the

VGI's trajectory. At the same time, and beyond entertainment, the VGI has catalyzed profound impacts on technology and society at large, becoming a cultural phenomenon that permeates popular culture, stimulates creativity, and nurtures global communities of ardent gamers.

2.1. A reflection on the Indie Games

While the above discussion addresses the historical development of the VGI, it is clear that the majority of the business and management research has focused on the AAA industry and the perspectives of big game companies, while paying less attention to the Indie Games.

The Indie games have emerged as a significant force within the gaming industry, challenging the dominance of AAA game development and offering unique experiences to players [29]. More specifically, the Indie games wield a substantial influence on the gaming industry through their distinct creative characteristics. These games often showcase artistic freedom, allowing developers to explore unconventional art styles and tackle diverse themes. For example, the work of Whitson, et al. [30] illustrates how indie cultural production fosters entrepreneurship, relational labor, and sustainability, highlighting the creative power inherent in indie game development. Furthermore, Grabarczyk [31] emphasize the importance of recognizing indie games as a distinct category, acknowledging their impact on shaping game genres[1] and pushing boundaries in gameplay innovation.

Indie games operate under a different business logic compared to AAA game development. While AAA games prioritize profit maximization and market-driven approaches, indie games prioritize creative integrity, individual vision, and community engagement. In this regard, Styhre and Remneland-Wikhamn [32] shed light on the norm of creative integrity within the indie game development community, highlighting the motivations and challenges faced by indie developers in maintaining their artistic and creative vision. This alternative business logic allows indie games to experiment with novel gameplay mechanics, explore thought-provoking narratives, and connect with players on a deeper emotional level.

Finally, the relationship between indie and AAA game development is complex, with ideological boundaries and mutual influence. Major companies recognize the creative power and innovative ideas stemming from the indie scene, leading to various interactions and attempts to tap into indie game development. Collaborations and publishing deals between AAA and indie developers, as evidenced in Whitson et al. [30] research, enable the exposure of unique and innovative indie games to a wider audience. Moreover, AAA companies often draw inspiration from indie games, incorporating indie-inspired elements such as art styles, gameplay mechanics, and narrative structures into their AAA titles.

3. Methodological approach for the Systematic Literature Review

This study aims fundamentally to systematically map out the landscape of extant VGI literature that is published in business and management journals, and provide novel insights into the intricacies and nuances of this unique industry. This selection has two key advantages. First, business and management journals offer a unique vantage point to examine VGI within the context of organizations, strategic decision-making, and innovation. The integration of VGI technologies and practices within businesses has significant implications for market expansion, consumer engagement, supply chain optimization, and organizational performance. Focusing solely on business and management journals allows for a comprehensive investigation of how VGI is being utilized, adopted, and managed in these sectors. Secondly, by concentrating on business and management journals, the review has uncovered and analyzed key themes that are intrinsic to the intersection of VGI and organizational dynamics. Themes such as customer engagement, innovation ecosystems, spatial analytics, and decision support systems are key issues within this domain. By excluding computer science and engineering journals, the review can maintain a clear thematic coherence and provide a focused analysis of themes directly relevant to the business and management sector. At the same time, the decision to exclude other domains (e.g., papers published in computer science and engineering journals) is not a dismissal of their importance; rather, it is a deliberate strategy to achieve a nuanced understanding of the strategic and managerial implications of VGI within businesses. This approach allows for a more in-depth exploration of the context-specific challenges, opportunities, and strategies that businesses and management researchers encounter in incorporating VGI into their practices.

3.1. Key research questions

This inquiry is based around three key research questions and a series of sub-questions. These questions were determined iteratively throughout the research process, with questions being altered, added or removed as the literature sample revealed various directional clues. The questions are as follows:

(RQ1) Within the business and management domain, what is the state of empirical research on the VGI? This included: how extensive is the overall body of literature? What forms of research methodology and samples had the literature taken? How unified was the literature surrounding the central topic of the VGI?

(RQ2) what are the key themes in this industry, and how these themes are conceptually connected? We determined these themes iteratively throughout the research process and found the following key areas: What is the unique product ecosystems of the VGI and the corresponding complementary goods, two-sided markets, and network effects? How innovation is currently understood and managed in the VGI? What is the current understanding of consumer psychology and commensurate marketing efforts in this unique customer segment? What is the current understanding of pricing models, given the wealth of novel monetisation strategies available in this unique hardware/software/service product offering?

(RQ3) What are the key findings of this piece and what are the implications going forward? These include managerial implications, theoretical implications, implications for future research as well as a discussion of the limitations of this paper.

To address these three questions, we adopted a rigours SLR methodology as illustrated in Fig. 1.

3.2. Scope of review

In terms of defining the extent of the studies captured by this review, it was important to predetermine the scope of inquiry [33]. The initial year of inquiry, 2007, was strategically chosen due to the transformative impact of the iPhone and the subsequent evolution of gaming technology into its contemporary state, as noted by Styhre et al. [34]. Recognizing the dynamic nature of Volunteered Geographic Information (VGI), we sought to avoid overly antiquated papers, which might offer limited insights into current discourse. As our analysis reveals, specific trends such as monetization strategies and marketing channels undergo significant shifts over time. This transformation is clearly evident in the literature, where the proliferation of smartphones and the consequent avenues for VG innovation, as highlighted by Wikhamn et al. [35], stand as pivotal drivers propelling the ongoing paradigmatic shift in the industry. The decision to include studies published after 2007,

[1] A game genre refers to a category or classification that describes the gameplay mechanics, objectives, and overall experience of a video game. Game genres are used to categorize games based on common elements, themes, and gameplay styles. They serve as a way for players to identify games that align with their preferences and provide a framework for understanding and discussing different types of games.

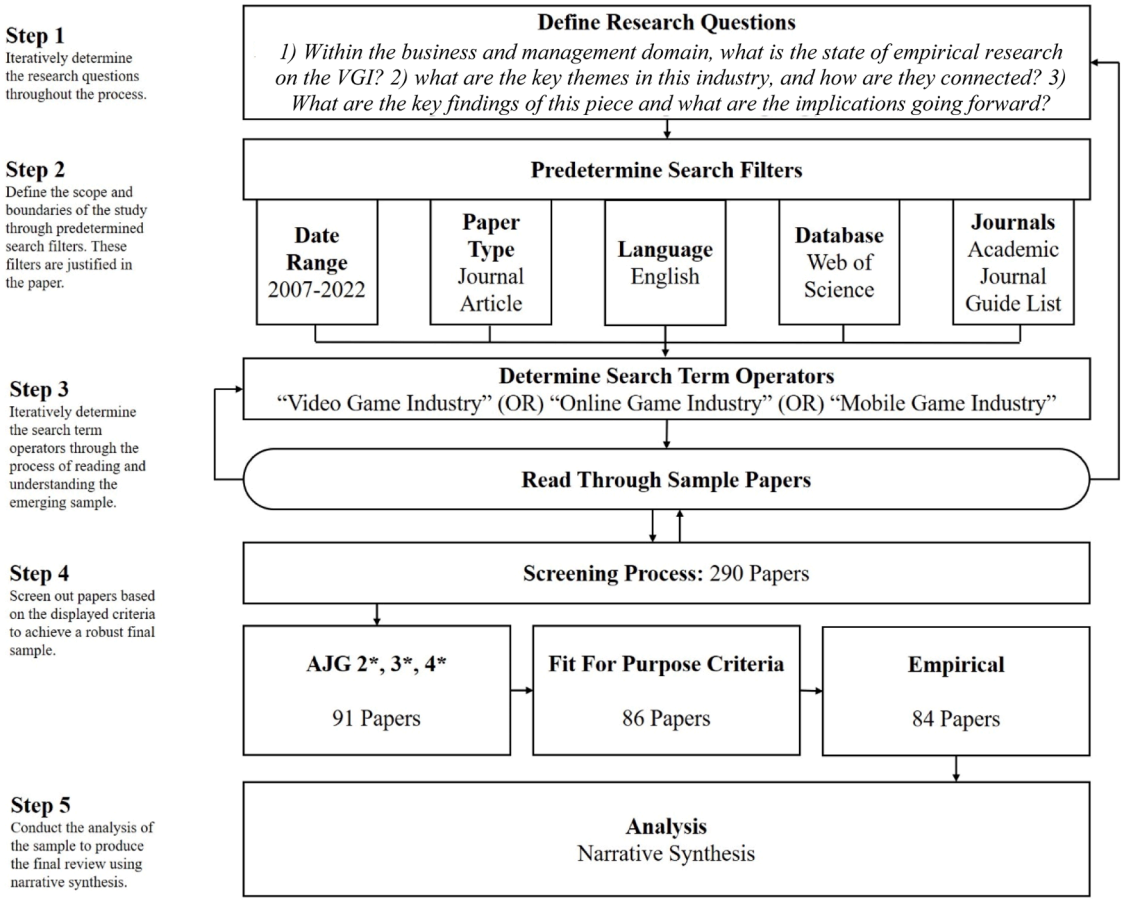


Fig. 1. Summary of methodology.

encompassing data and case studies predating this year, was considered advantageous. This approach not only enriches the context but also curtails the inclusion of outdated VG phenomena, such as arcade game distribution, which might otherwise diminish the relevance of the review. The year 2022 (September) was judiciously selected as the final inclusion point to ensure the incorporation of the most pertinent and up-to-date sources.

Proceeding papers, book chapters, review articles and other non-peer-reviewed articles were also filtered out. This was done primarily to help ensure academic rigor and quality in the sample selected, but had the additional benefit of both limiting the sample to a realistically manageable size as well as ensuring that they were sources that we would have access to. We also limited the search to only include articles published in the English language. In addition to this, in order to ensure only a high quality of research was included in the sample, only articles that are featured in 2*, 3* or 4* journals from the AJG list were included in the search [36]. The version used was the 2021 edition, which is the most up-to-date at the time of writing. On top of the academic rigor that is theoretically ensured by the peer-review process necessary for a paper's acceptance into academic journals, the widely recognised mark of quality provided by the AJG list further ensures the quality of the sample. This limitation (along with the filters mentioned in the preceding paragraph) also had the added benefit of limiting the sample to a realistically manageable volume, whilst ensuring that the highest quality research was not neglected.

We selected Web of Science (WOS) as the primary database. WOS is a 'unifying search tool' which retrieves articles from a collection of databases [37]. It was selected due to its extensive and holistic offerings of a variety of interdisciplinary articles, granting access to over 79 million files, as well as possessing an advanced and intuitive search functionality.

Once the search criteria had been established, the next step was to determine the specific search term combinations. Given the various ways in which VGs are referred to in common parlance, it was necessary to conceive of additional ways in which the VGI might be referred to. Eventually, after scanning a number of papers for how the VGI might be denoted, the relatively simple search terms established were: *"Video Game Industry"* (OR) *"Online Game Industry"* (OR) *"Mobile Game Industry"*. These relatively broad terms were selected due to the aim of holistically capturing extant empirical literature surrounding the industry whilst attempting to filter out the pervasive use of both "Game" and more surprisingly "Game Industry" in literature that in fact, bears no relevance to the VGI. Additionally, these search terms broadly represent the development of the VGI from predominantly TV and video based towards the more modern distribution methods of online and mobile. These search terms were established iteratively through repeated searches with various search terms and a rudimentary scan of the sample thrown up by the database, in order to ascertain relevance and quality.

3.3. Sample selection and screening process

Once the search criteria, terms and database had been established, the next step in the systematic review process was undertaken. This involved obtaining a sample and then screening and rationalising it, in order for it to be useful for the analytical purposes of the study.

The first step was to capture an initial sample. This was done by implementing the aforementioned search terms and their commensurate Boolean operator strings in the WOS database. The "Advanced Search" feature of WOS was utilised to ensure the necessary prerequisite conditions were adhered to in the result. A preliminary sample of 290

papers was yielded, stored in EndNote and then transferred to an Excel spreadsheet, where they were indexed numerically by the place they appeared on the search. Other data included on the spreadsheet were the title, author's name(s), publication year, journal and abstract. These papers were then checked against the AJG list to ensure they were strictly from 2*, 3* and 4* ranked journals, reducing the sample to 91. This decision was made following the recommendations of previous SLRs to ensure academic quality [38,39].

The second step of the research process involved a meticulous and systematic inductive analysis of the papers to derive a set of relevant and high-quality questions. This iterative process commenced with a careful examination of the titles and abstracts of the papers to assess their suitability for the study's objectives. Through this initial analysis, a clearer comprehension of the central concerns that surfaced across the majority of the papers started to emerge. The inductive analysis enabled the identification of recurring themes, key concepts, and critical areas of investigation within the body of literature. By systematically reviewing the papers, patterns and commonalities in the research topics, methodologies, and findings were observed. These observations informed the subsequent development of a predetermined set of questions that reflected the central focus and areas of inquiry present in the papers. This iterative process ensured that the selected questions were grounded in the empirical evidence and the unique characteristics of the research field. As the analysis progressed, adjustments were made to the questions to better align with the emerging themes and central concerns that were identified. Through this rigorous and inductive approach, the final set of six questions was derived, representing the key dimensions and aspects of the research topic that were consistently addressed in the reviewed papers:

1. *Is the central concern of the paper related to the VGI?*
2. *Does the paper address the role of product ecosystems, complementary goods, network externality, or two-sided markets?*
3. *Does the paper address pricing models?*
4. *Does the paper address consumer marketing, customer psychology, or behavior?*
5. *Does the paper address innovation?*
6. *Does the paper address overall VGI business model survivability/ sustainability?*

Papers were accepted if they answered 'yes' to both question (1) and any of the other 5 questions. Five papers were rejected based on these grounds, resulting in a sample size of 86. Additionally, two non-empirical studies were excluded, resulting in a final sample size of 84 (refer to Appendix B for the full list). It is worth noting that although these non-empirical studies, such as Tsang's [6] detailed narrative account of Innovation in the British VGI, were excluded from the analysis, they provide valuable contextual insights and are referenced in the discussion.

3.4. Analysis and synthesis

With the central aim of enhancing comprehension, coherence, and lucidity in the intricate domain of VGI studies, we opted for a narrative approach to meticulously analyze the collected paper sample. Given the diverse and multifaceted spectrum of research topics encapsulated within the VGI domain, the narrative approach is inherently suited to our investigatory pursuit. This methodology facilitates the fluid amalgamation and dynamic synthesis of divergent research threads, enabling the convergence of previously disconnected outcomes from both quantitative and qualitative investigations.

Especially pertinent to our comprehensive inquiry, the narrative analysis method proficiently interlinks these scholarly strands, thus serving as an imperative tool in constructing the present conceptual framework for the field.

The analytical process was underpinned by the widely acknowledged tabulation techniques as delineated by Miles et al. [40], serving as a robust foundation to systematically classify the extracted dataset. The extraction procedure commenced with a deductive identification of key areas of inquiry, findings, methodologies, along with authorship details, publication dates, and journal sources. This comprehensive information was meticulously documented in an Excel spreadsheet. Leveraging this repository in tandem with emergent insights garnered from prior stages, we organically derived overarching themes that formed the structural framework for the subsequent coding analysis. These overarching themes were inductively discerned and include: "Commercialisation and Distribution," "Product Ecosystems," "Consumer and User Psychology and Marketing," "Innovation Management," and "Overall Model Survivability and Sustainability." For more detailed and definitive explanations and scope delineations of these themes, please refer to Appendix C.

Following this initial phase, an exhaustive examination of the sample papers was conducted within the purview of the identified themes. This analytical phase engaged both inductive and deductive reasoning, imparting a higher resolution to the overarching themes. This process culminated in the derivation of intermediary and subordinate themes, which were seamlessly interwoven with the core themes. For instance, the overarching theme of "Innovation Management" in the VGI sphere was dissected into finer facets such as "Optimising Innovation Networks," "Open Innovation, In-House Development and User Generated Content," "Location's Impact on Innovation," "Innovation vs Imitation," and "Human Resource Management (HRM) in Innovation." This dynamic process involved an iterative refinement of themes, including their addition, elimination, consolidation, or further subdivision, as the analytical journey progressed.

4. What is the current landscape of the literature surrounding the VGI

In order to increase clarity and coherence of the VGI field as a whole, this section aims to provide an overview of the literature surrounding the VGI. It will summarise and evaluate the key elements of the field, including the authors, journals, publication years, methodologies used and underpinning theoretical foundations. By articulating the overall academic landscape of the papers accepted into the sample, this section will quantify research trends, with a view to form the foundation of future research.

4.1. Publication year

In order to ascertain the overall health of the field, it is important to establish the distribution of publication across time. An increase over time of publications would be indicative of a burgeoning field, which is attracting increasing interest. As demonstrated in Fig. 2, this trend applies to the VGI field with an increase over time of papers published. Only 16.6 % ($n = 14$) of the articles in the sample were published in the first five years compared to 50.0 % ($n = 42$) of the papers which were published in the last five years. Interest in the field is clearly growing.

4.2. Journals

In terms of the journals in which these articles have been published, there is a significant spread, see Fig. 3. Over a third of the articles were published in eight journals 38.1 % ($n = 32$). These journals are: Technological Forecasting and Social Change 8.3 % ($n = 7$); Information Systems Research 6.0 % ($n = 5$); International Journal of Innovation Management 4.8 % ($n = 4$); Journal of Marketing 4.8 % ($n = 4$); Journal of Economic Geography 3.6 % ($n = 3$); Management Science 3.6 % ($n = 3$); Journal of Consumer Behaviour 3.6 % ($n = 3$); Technovation 3.6 % ($n = 3$), the other 61.9 % ($n = 52$) are all distributed between 38 different journals, with either 1 or 2 publications each. Whilst clearly technology and innovation form the core concerns for the majority of the

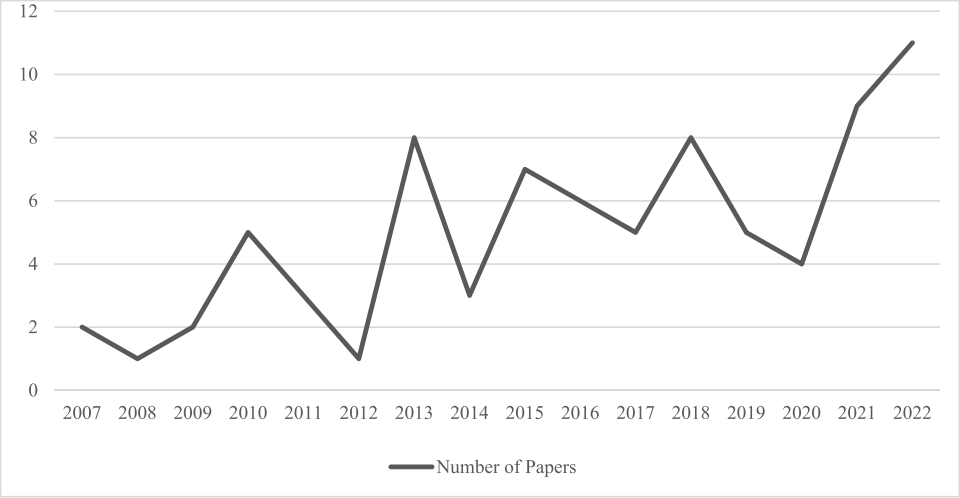


Fig. 2. Publication trend.

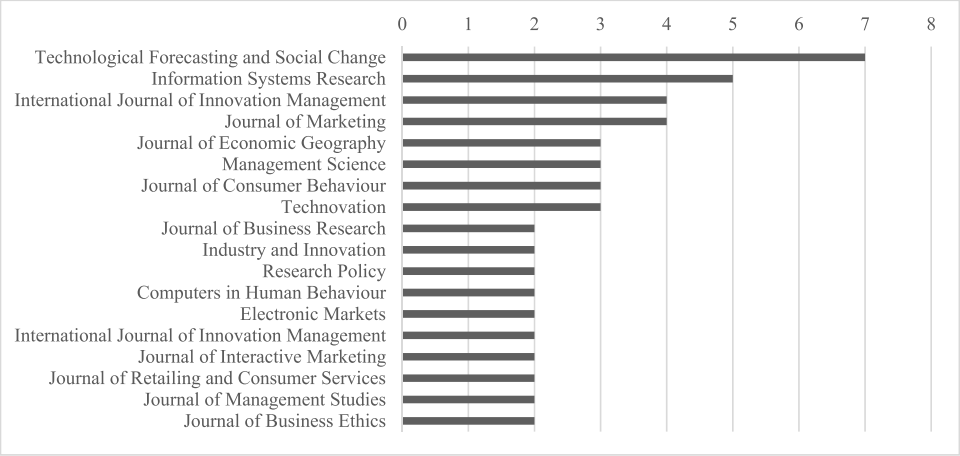


Fig. 3. Key publishing journals.

articles, the diffuse spread across journals from disparate fields is still noteworthy. The eclectic range of journals within which VGI literature has been published, demonstrates the relative lack of coherence within the field and further validates the necessity of this study.

4.3. Locational context

We analysed the locational context of the papers within the sample. Whilst many of the papers 50.0 % ($n = 42$) did not have an overt locational context or scope of inquiry, for the remaining papers which did, there was significant clustering around certain nations. Unsurprisingly, given the size and maturity of their domestic VGI, the US had the largest quantity of papers either relating to its market, industry as a whole or a focal domestic firm, 22.6 % ($n = 19$). This was followed closely by Japan, 14.3 % ($n = 12$). Neither of these results are surprising, due to the long-standing supremacy of American and Japanese firms since the industry's beginnings. In particular, Sony and Nintendo in Japan and Microsoft in the US, represent almost total dominance in the home-console market up until today [41]. Europe has a reasonably large representation with 12.5 % ($n = 10$). Other countries represented are as follows: China 4.8 % ($n = 4$), Canada 3.6 % ($n = 3$), Australia 1.2 % ($n = 1$) and Korea 1.2 % ($n = 1$). 3.6 % ($n = 3$) of papers engaged in international comparison. 8.3 % ($n = 7$) claimed to have a global focus.

What is most notable from these findings is the significant dearth of literature focusing on the Chinese VGI. This is particularly important as China has surpassed the US to become both the largest and fastest growing market in the sector today [42]. It is likely that future research must relinquish its focus on console-based distribution, in order to capture more fruitful and modern avenues taken by the Chinese VGI and the VGI as a whole, particularly online and mobile [17]. Due to this study's exclusion of non-English language papers, it is a distinct possibility that a growing canon of Chinese, Japanese or other non-English language VGI literature already exists, which may well fill some of these gaps. Therefore, a synthesis of these cross-language bodies of work will likely be a fruitful avenue for future researchFurther to this, developing countries such as Nigeria and Kenya have an emerging and highly innovative VGIs [43]. The total absence of literature from less developed countries in the sample, is a significant barrier to the goal of completeness within the VGI field of research.

4.4. Key firms

One frequently represented paper type was the analysis of a specific firm. In this domain, the influence of console industry leadership was clear, with disproportionate attention afforded to the American and Japanese titans Microsoft, Sony, Nintendo or any of their subsidiaries. 15.5 % ($n = 13$) were based around or significantly influenced by one or more of these three companies, which is particularly salient due to the significant number of papers not being centred around a focal firm at all 80.0 % ($n = 67$). In fact, of studies which did have a focal firm, only 3.6

% ($n = 3$) were not about one of the aforementioned three. It should be additionally noted that these other companies, Ubisoft, Machinima and Twitch, rely heavily on the products of Microsoft, Sony and Nintendo in order to conduct their business [44,45]. This is a clear indication that the current VGI is oligopolistic. Their presence in the literature would indicate that those three firms predominantly comprised the VGI cartel. However, given the meteoric rise of the Chinese VGI [46] there appears to be a gap in the field. Once again, the limitation of English language articles could be contributing to this glaring omission. Notwithstanding, English-speaking authors should endeavour to conduct equally comprehensive studies of other VGI players such as the Chinese giants TenCent or NetEase, in order to provide a more balanced context.

4.5. Types of methodology used

In terms of research method quantitative, qualitative and mixed approaches are all represented within the sample. Quantitative studies appear the most at 64.3 % ($n = 54$), followed by qualitative at 23.8 % ($n = 20$) and finally mixed at 7.1 % ($n = 6$). From this analysis of methodology choice, it is clear that quantitative research is the predominant research methodology in the VGI field. This can be largely explained by the focus on quantitative predictive modelling papers in the sample, with the ultimate aim of providing managerial recommendations to maximise revenue in this industry. However, many aspects of the themes captured by this study might benefit from additional qualitative research such as certain aspects of user behaviour and consumer psychology.

4.6. Emergent theoretical paradigms

Whilst many of the articles were not conducted in the context of a specific theory, there were a significant number of emergent exceptions. For example, given that the VGI is largely a generational-product driven industry [47] it is unsurprising that one of most prominent theories discovered in the literature, in a number of variations, is the Product Life Cycle Theory [48]. In short, this widely recognised theory, seeks to outline the stages that a product goes through from its introduction to market until its eventual obsolescence. In the context of the VGI, there are significant externalities relating to the unique nature of the dominant product offerings, which are frequently analysed through the lens of the Product Life Cycle Theory in papers from the sample. For example, intergenerational product cannibalisation [49], as well as the effects of new comer competitive platforms feature prominently in the literature [50].

In addition to this, though few articles directly reference network theory [51], it is clear that many of the articles appear to be addressing the issues of the VGI, such as product ecosystems and two-sided markets and development process through the lens of network theory. Network Theory is the idea that firms and their constituent elements are embedded with a network of interacting players. This is an inherently relevant theoretical lens to adapt to the VGI, as the intricate web of different players forms the basis of production for the complex product systems which exist within the industry [41,52,53]. The presence of direct and indirect network within the VGI shows the potential of value creating and capturing drivers by different network partners.

Finally, the theory of Organisational Learning is a pertinent framework behind innovation in the VGI [54]. This theory explains the flows of knowledge within an organisation and between organisations. This understanding can be supplemented with concepts such as the SECI model of knowledge internalisation [55]. In the inherently knowledge flow driven context of VGI innovation, the importance of capability enhancement and internalisation of new knowledge is a highly prominent notion [11,56]. Whilst few studies reference this theory, many of the concepts they study can be explored through the lens of Organisational Learning Theory.

5. Findings on the key areas of research in VGI literature

Upon finishing the coding process, key areas of focal interest emerged. Though no two articles studied precisely the same phenomena, the vast majority of the papers nonetheless could be categorised into five emergent themes, as summarized in Appendix C. These themes were derived iteratively, through deductive-inductive logic and designed with the objective of capturing a significant width of literature, whilst simultaneously delineating a distinct epistemological taxonomy. This appears to have been successful given the relatively few articles that inhabit more than one theme. Each theme was then divided into sub and bottom level categories, which increases the resolution of the ideas captured by the high-level code, as well as having the potential to broaden the inclusion criteria, creating a periphery.

These peripheral areas of knowledge can provide invaluable insight. In their exposition below, we seek to not only delineate the key nuances of the discussion surrounding each theme, but also to conduct inter-thematic synthesis. A visual representation of some of the key points and their commensurate procedural connections can be seen in Fig. 4. The reader will notice that the themes outlined in the section below do not perfectly align with the five key areas within the framework. This is deliberate, reflecting the intrinsic linkages between the taxonomical categories.

5.1. Research on product ecosystems, two-sided markets and the unique nature of the VGI's product offering

One of the most prevalent concerns emerging from the sample, was the discussion surrounding the unique nature of the product range exhibited in the VGI. This is unsurprising, given how fundamental product optimisation is in the VGI as well as in business as a whole [57]. A deeper understanding of how best to optimise these complex systems will have inherently significant managerial implications. The literature provides many promising avenues of research, with the objective of maximising output from platforms for firms within the product ecosystem. These firms fall broadly into two categories, platform providers and publishers [58]. Here the 'publisher' refers to a combination of publisher and developer roles, which are often two distinct entities. This is acceptable due to the economic motives of both entities being more or less aligned in relation to their product and the commensurate host platform. Conversely, this is often not true in the case of publishers and platform providers [59]. Given that these two types have significantly differing relationships with the platform system, the extant literature generally directs its research towards one type of firm [60,61]. However, in many of these studies, examination of the interplay between publisher and platform provider (these two halves of the same product offering) have yielded many preliminary findings. This phenomenon is most commonly referred to as a Two-Sided Market [50,62]. Some articles additionally reference Two-Sided Markets implicitly, through examination of concepts such as complementary goods and product ecosystems [63]. The findings of many of these studies could generate significant managerial implications for both platform providers and publishers and so more detailed examination in this area is warranted.

The issue of multi-homing is a key consideration in the understanding of Two-Sided Markets and has been given significant coverage in the literature. Multi-homing is the concept of providing your software product across multiple platforms [64]. The abundance of complementary goods (i.e., the number of titles) on a platform is a key variable between platform types and so the trade-offs between multi-homing and platform exclusivity must be considered. The findings of Maruyama et al. [53], imply that the more game titles there are embedded in the platform, the more likely a new publisher will seek to join that platform. Intuitively it seems that a broader complement base would be attractive to consumers. This fact should be considered in light of the findings of a study which demonstrated that the presence of high level

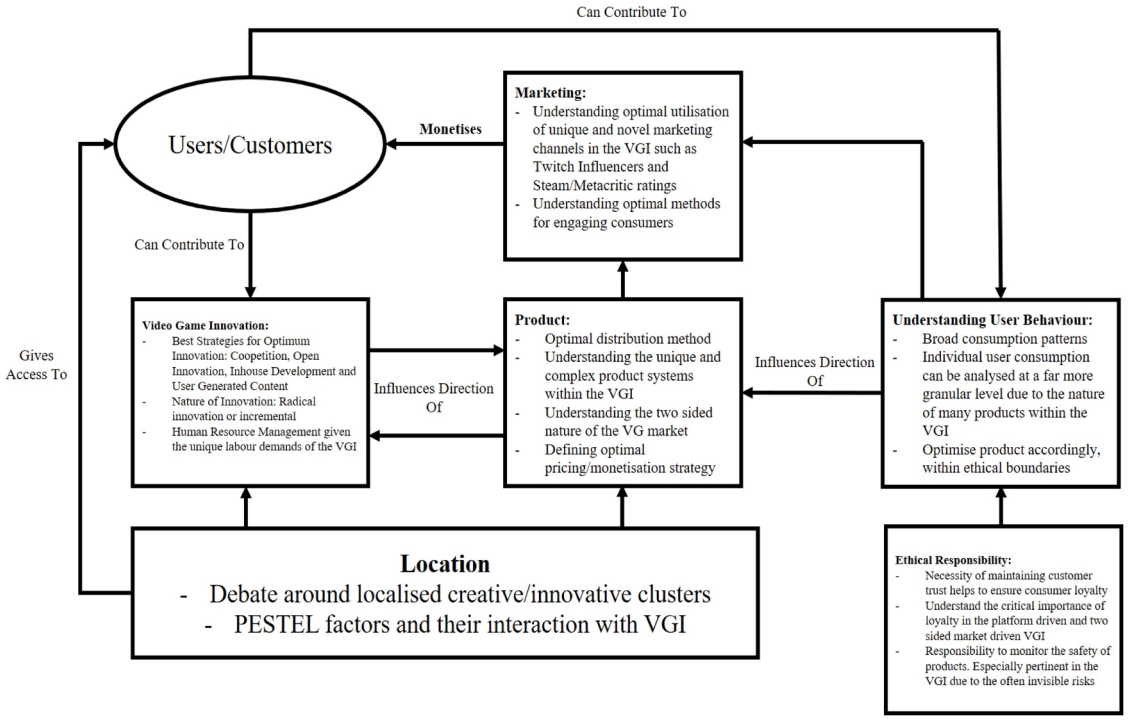


Fig. 4. A conceptual framework to map the VGI dynamics.

complementors (i.e., publishers) leads to an increased market dominance [41]. Therefore, superficially it would seem pertinent for platform providers to unreservedly encourage complementors to enter their platform ecosystem and ignite a virtuous cycle of complementors.

However, somewhat counterintuitively, other findings imply that increased multi-homing onto a platform actually hurts sales of a nascent platform system but this effect is negated with time and maturity [65]. Strangely, this appears to be directly contradicted by studies, which imply that the multi-homing onto mature platforms actually decreases market share, but increases it when the platform is new [66]. Both studies highlight the importance of temporal considerations when engaging in multi-homing a product, yet in opposite directions. One seeing early entrance as optimal, the other seeing late entrance as optimal. Given the agreement on timing being an impactful variable in multi-homing success or failure, it would behove both publishers and platform providers to seek clarity on this contradiction. The findings of a later study lend some weight to the notion that mature stage platforms are harmed by increased multi-homing [67]. Their article suggests that the divergence in genres, accelerated by cross-platform diffusion leads to an overall platform decline. However, this finding was only based on two relatively archaic platform systems (Nintendo DS and Sony PSP) and so further inquiry into this is necessary.

Perhaps an additional explanatory dimension to nuances of multi-homing, found in the literature, is the concept of quality across platforms. It was found that overall game quality was lowered when multi-homing in a number of capacities, from re-homing a game away from a focal platform to multi-homing over platforms with divergent technological development [64]. A study to synthesise the aforementioned temporal dimension with the notion of game quality would certainly provide greater clarity to publishers and platform providers engaging in multi-homing.

Another related concern highlighted in the literature, is the notion of product cannibalisation in a platform market. This is studied both in the context of the platforms themselves cannibalising inter-generationally, as well as the impact of new entrant complementors on incumbent software. Given the aforementioned tendencies of many publishers to gravitate towards platform systems with a higher density of complementors [53], the recent findings of Allen et al. (2022) may confound this sentiment. Their findings indicate that new entrant software invariably cannibalises incumbent sales. There are mediating factors which somewhat overcome the cannibalisation, such as increased overall platform sales. However, the threshold for net benefit to incumbent complementors is only achieved if the new comer is a "superstar" and part of a franchise. Considerations of new comer cannibalisation, represent a further variable in the decision making behind multi-homing and have implications for both publishers and platform providers. Further examination of the interplay between timing, quality considerations, genre diversification and complementor density may reveal fruitful managerial implications. In light of this debate, earlier studies such as one which distilled the failure of N64 down to a 10 % shortcoming in complementary game titles [68] may consider methodological revisions.

5.2. *Research on monetisation strategies*

The unique nature of the product systems in the VGI allows for and sometimes necessitates, serious consideration surrounding the myriad novel monetisation strategies which could be potentially adopted by a VGI firm [69]. The literature, provides some analysis and modelling of various pricing strategies within different contexts, but the recency of many of the phenomena's emergences have meant that literature surrounding the matter is naturally preliminary. An analysis of the key findings surrounding the VGI literature's current understanding of monetisation strategies is presented below.

In a somewhat prophetic manner, an early study into the individual impacts of pricing strategies found that VGs were a highly elastic product and that consumption was significantly correlated to individual wealth [70]. Since the publication of that article however, the literature elucidates the paradigm shift in pricing strategy within the industry, which has allowed for value to be extracted from a range of income brackets. Studies in the earlier half of the 2010s focused on testing various pricing strategies surrounding product bundling [71,72]. Contemporary studies however, demonstrate another paradigmatic shift in monetisation strategy in the VGI [73]. The emphasis of the current

frontier is now on more tacit methods of revenue extraction. The strategies most emergent in the literature are the concepts of "Loot Boxes" and "Freemium" [74,75].

Loot Boxes are a relatively novel revenue generation channel, which have demonstrated superior characteristics over traditional pricing strategies [73]. Whilst probabilistic revenue generation is certainly not unique to the VGI, the manner in which it is conducted is certainly distinct from other analogues, such as the Gambling Industry and a focused study is warranted [76]. They can be referred to as Loot Boxes, Mystery Crates, Treasure Chests or even Packs of Playing Cards. However, the central premise behind all of them is that an unknown prize or set of prizes is either earned through the game or more frequently purchased with real money. The box can then be opened by the user and they are rewarded with a randomised selection of in-game items, such as character skins, weapons or vehicles [74]. The prevalence of articles relating to Loot Box strategy significantly increased in the latter half of the study's scope, whilst the articles concerning Point of Sale (PoS) product bundling diminished. It could be inferred from this shift that these novel strategies are taking precedence in overall VGI monetisation strategy. Additionally, the slightly more established concept of "Freemium", games given away for free but with in-game monetisation, has synergised with monetisation strategies such as Loot Boxes, to the point where for some firms, traditional sales are a secondary consideration [75]. Future research into the optimal monetisation strategy in the VGI appears to be shifting away from the early PoS pricing strategies, towards Freemium and Loot Boxes.

However, recent literature also reveals the obverse effects of Loot Box/Freemium strategy. The combination of no up-front costs and the prevalence of platforms, in particular the smartphone, means that children are frequently exposed to Freemium games which have Loot Boxes. Given the intuitive analogues that these forms of revenue generation have to gambling, a comparable body of literature has emerged seeking to understand the psychological effects that these novel phenomena might have [7]. However, the scope of previous inquiries has not extended to the overall impacts that these new technologies might have on people's psychological health. Given the growing importance of Corporate Social Responsibility (CSR) in corporate strategy, it would behove managers to consider this ethical unknown in greater detail [76]. Section 4.3. will examine this further.

In terms of covering other pricing strategies present within the VGI, the literature does allude to other methods such as subscription pricing [77] as well as more generalised frameworks surrounding value creation in the VGI [15]. However, a detailed body of work examining this strategy does not exist within the context of this sample. Further study, perhaps conducted through a comparative lens, is needed to holistically further the understanding of pricing strategies in the VGI.

5.3. Research on consumer psychology and marketing

In addition to seeking ways to optimise the monetisation of VG products, a significant portion of the literature is devoted to understanding the uniquely complex VG user experience (UX), psychology and marketing [78]. Given the complex interplay between art, music, storytelling, technology and entertainment, optimising the UX of a particular software product offering is extremely important for achieving a significant user base [47,60,79]. This in turn is significant, given the evidence surrounding the impact of installed user base on platform success [77]. Studies in the UX and user psychology area of the field, tend to emphasise maximising user engagement through the adjustment of variables such as reward algorithm, user skill, difficulty, novel hardware and social features [63,80]. Many of the articles related to the understanding of UX and consumer/player psychology in the VGI, are published in either the Journal of Consumer Behaviour or the Journal of Business Ethics [69]. This is unsurprising, due to the inherent linkages this area has with aspects of the field of behavioural psychology more generally [81].

This complex field of study should not be underestimated and future findings relating to the previous section on ethical monetisation strategy could be fruitfully synthesised with this literature on optimising consumer engagement. The predominant metric of success in these studies tends to be the maximisation of play-hours [1]. Clearly there is productive discourse to be had surrounding balancing maximising play-hours with the ethical considerations of VG and gambling addiction [69]. Some studies seek to understand consumer behaviour in a more 'traditional' capacity, modelling the interaction between buyer and sellers on older platforms [62]. A synthesis of these older supply/demand models with newer findings surrounding consumer engagement with VG products, could yield significant managerial implications as well as open up new avenues of VG consumer psychology inquiry.

In tandem with the literature surrounding utilising consumer psychology to optimise VG products, various inquiries into marketing are also present in the sample [82]. Unlike other entertainment industries such as film or music, the VGI has a unique set of novel online marketing channels which are explored in these studies [83]. In particular, the role of influencer marketing through platforms such as Twitch receive attention, especially in more recent studies [45]. Twitch, an online live streaming service, features live footage of product gameplay as well as professional "Esports" competitions. Findings in the literature indicate leveraging these channels can have a significant positive impact on game sales [61]. Further inquiry should be undertaken, to best understand how to optimise the relationship between publishers, live streaming platform ecosystems and organised competitive gaming to understand the nuances behind this effect in further detail.

A further aspect of VGI consumer marketing, addressed in the literature, is the concept of online reviews and search engine optimisation (SEO) [84]. Whilst not totally exclusive to the VGI, there is a certain aspect of the VGI's relationship with online reviews and SEO, that have unique characteristics in the VGI. In particular, the utilisation of reviews on gaming platforms such as Steam have been studied across the temporal scope of this paper [85]. Earlier studies focused on the impact that consumer reviews have on sales performance [86], whilst later on, the focus appears to have shifted more towards understanding how to optimise strategy around consumer reviews and SEO [79,87]. Factors relating to this optimisation include size of installed user base as well as perceived quality. It therefore, seems logical that future research on this optimisation would include considerations on the effects of installed user base and degree of complementarity, which were outlined in Section 5.1. It should be noted that Chinese platforms are underrepresented in this study. This is significant due to the models of Chinese software companies being far more platform integrative [88] and therefore have the potential to yield greater quantities of data regarding the effects of ratings, SEO more generally, as well as other digital marketing variables. Studies seeking to unify Chinese literature on this matter with this sample could provide significant insight.

5.4. Research on innovation within the VGI

Successful innovation management is a fundamental factor in the success of most industries and its study is a large and growing field [89,90]. Information can certainly be shared between VGI innovation literature and the broader field of innovation management. However, akin to consumer psychology and marketing, this literature sample highlights some unique aspects of innovation within the VGI [15]. Consequently, isolated study of innovation optimisation within the VGI is warranted and a relatively large corpus of work on this topic is represented within the literature [91].

Of particular prominence in the sample, is discussion surrounding the notion of open innovation [92]. Open innovation, otherwise referred to in the literature as coopetition, is the process of engaging in innovation with the help of rival firms within the sector [93]. Whilst the impact of open innovation on typical hardware and software demands are being studied with increasing intensity [94], certain characteristics

of the VGI's product offerings once again necessitate a detailed examination of the subject, in order to ascertain the nuances of open innovation in the VGI, versus other innovative industries [56]. Studies have been conducted which show that the majority of VGI firms engage in some form of open innovation [95], whilst others broadly demonstrate a net benefit in undertaking open innovation [93]. However, there are myriad variables which must be considered when engaging in open innovation and the literature goes some way in delineating the variety of forms open innovation can take [96]. Two predominant concerns, however, are emergent from the literature: the concept of locational clusters and the understanding of network ties [52].

In terms of locational clustering, earlier studies in the set focus on the broad variable of number of firms present in the cluster, in order to predict the quality of cluster innovativeness [97]. Building upon this understanding later studies attempt to seek greater resolution in understanding the success of creative clusters by measuring the impact of cluster maturity [98]. More recent studies have sought to deepen this analytical resolution by examining more tacit variables such as the presence of and extent of industrial knowledge bases [52]. Other contemporary studies stress the impact of location specific factors. These included the presence of "good learners", higher levels of R&D investment, greater economic development and better infrastructure [17]. This interestingly goes some way to contradict earlier findings, which minimise the role of location specific factors on cluster maturation [98]. However, the overall understanding of the concept of locational clusters and their potential as innovation ecosystems is limited [58]. These factors and their relationships and antecedents, relating to open innovation in the VGI, must be studied in greater detail [96]. Further studies seeking to examine innovation success in this arena would yield important managerial implications in VGI innovation success [8].

In addition to concerns surrounding the engagement in and optimisation of innovation clusters, the literature puts some emphasis on the optimisation of network ties [56]. This is seen as a significant driver of innovation success or failure and is another key variable in the calculation to undertake open innovation. The strength of network ties between actors in the industry, as well as the diversity of network partners, form an interplay which is poorly understood [92]. Further inquiry as to how best to optimise innovation networks through network partner linkages must be undertaken in order to further elucidate this subject. Conceivably, future research could incorporate findings from the broader field of innovation management literature, where contextually appropriate.

The notion of user entrepreneurship is a concept that is relatively unique to the VGI [44]. This is the concept of deriving valuable innovation from members of a firm's user base. It can take a multiplicity of forms and thus has been studied from a number of angles in the sample. In the literature this user-producer chimera, is sometimes referred to by a portmanteau such as prosumers (producer/consumers) or playbors [sic] (players/labourers) [99]. A limited number of early studies evaluated the overall costs and benefits of rudimentary user entrepreneurship, using traditional economic modelling [100]. However, an increased acceptance of this practice by the industry is reflected in the nature of later papers. More contemporary studies focus on how platform firms may best optimise both their relationships with their user entrepreneur community [57] and how different actors within the production process might best organise [101]. Though studies have investigated techniques such as community monitoring [102], artist led distribution [103] or improved social software [104], the understanding on this phenomenon within the field is still nascent.

HRM in VGI innovation is seen as particularly unique relative to other industries given the significant breadth of skills required to create a video game [11]. The significant artistic, musical, storytelling, technological and entertainment considerations which are required mean a diversely skilled workforce is necessary [105]. Additionally, many VG firms approach VG production with a contractual, project-based work-flow, meaning staff turnover is often related to on-going projects [106]. There is some debate as to the efficacy of this as a strategy, with comparisons being made between companies who take this approach and other companies who engage in more permanent in-house publishing [107]. This notion of in-house versus contracting external developers, has implications on the questions of multi-homing onto different platforms outlined in Section 5.1. Whilst this seems like a significant element of VGI innovation, linking innovation to the actual product and distribution, it is covered by relatively few papers in the sample. Further research should be conducted in order to gain deeper insight into the optimal strategies for HRM in VG innovation strategy.

5.5. Overall VGI business model survivability/sustainability

The concept of VG firms' overall business models certainly displays some unique characteristics when compared with other industries. However, the differences here appear to be less divergent than those of the previous factors, with general theories and concepts being applied to the VGI [108]. Some of the studies from the sample have taken a broader approach to studying VG firms' business model structure, as well as including more holistic studies of the VGI at the industry level. Many of these studies are particularly useful for providing longitudinal insight into the evolution of both overall VGI corporate strategy and structure, as well as the industry as a whole [10]. In particular, the paradigmatic shift in the nature of VG distribution, platform and monetisation strategies outlined in Sections 5.1. and 5.2. are emergent in the context of overall business model survivability and sustainability. Many of these studies take the form of broad-spectrum performance analysis of significant samples of individual games as well as firms [109] in order to begin to articulate the unique landscape of the VGI.

Whilst these studies do provide insight into factors such as regulatory environment, market population and internet access and how they uniquely impact the VGI [110], further integration in more fine-grained detail with more specific aspects of VGI processes such as product distribution 5.1, 5.2 and innovation management 5.4, will add greater clarity and add more variables to these more general studies. Furthermore, regional studies, such as those carried out on the British VGI could be significantly augmented with other regional or global studies in this inherently global industry [111]. For example, studies undertaken on M&A performance and risk-taking behaviour trans-nationally could be synthesised with findings of survivability antecedents, all in the context of the aforementioned unique factors [112]. Overall additional insight and comparison between these factors in the context of the VGI, could be fruitfully compared with findings in analogous industries which have been undertaken in earnest in other fields [113].

6. Discussion

The field of VGI research is clearly a burgeoning one, with an increasing number of published articles and growing managerial interest around the subject. However, the field is currently not coherent, with many disparate strands of knowledge, hailing from a multiplicity of different areas of research. This fragmentation of understanding makes it challenging, both for researchers who wish to build upon this body of knowledge, as well as practitioners who wish to gain managerial insight from the findings of the papers. Therefore, the goal of this paper is to systematically map out the core of high-quality extant research on the topic and then critically review and synthesise the findings in order to provide insight as well as identify gaps for future research. Through the SLR methodology and narrative synthesis this paper identified the key features of the main themes surrounding the VGI as well as the linkages between them. The next section will provide a discussion on the managerial implications gleaned from this study, the limitations of this study and directions for future research based on emergent gaps and deficiencies in the literature.

6.1. Managerial implications

One of the key points of interest raised in the literature for practitioners working as both platform providers and publishers, is how best to manage the relationship between the two entities. Outcomes of this relationship, such as intergenerational and ecosystem cannibalisation, should be considered in the context of the moderators highlighted in the literature such as entrance timing of complementary goods; platform maturity; quality issues when providing across different platforms (multi-homing); game genre; the product being a "super-star", franchise or other variables relating to the overall quality of the complementor; base user population and population of complementary goods already present in the ecosystem. Whilst this study attempts to begin the process of unifying these various antecedents to platform and product success, managers may find significant strategic avenues for their specific project by holistically reading the findings of the papers outlined in the study. Caution however, must be exercised given the incompleteness of the studies. Nonetheless implications can certainly be gleaned in order to guide decision making in this complex process.

Another key managerial theme emergent from the literature is the notion of specific video game and monetisation design in the context of human psychology. The nature of VGs as a product means that they have an inherent link to human psychology and the prevalence of children as VG customers has meant that significant CSR attention has been drawn to the ethical design of VGs [69]. Given the dual nature of the studies surrounding this topic, with one side emphasising maximising consumer engagement and the other concerned with user health and safety, it will be important for managers to balance their understanding of these forces, or else risk issues such as negative PR or government regulation [7].

Innovation is clearly a central managerial concern in most industries and the VGI is no exception. Significant factors such as clustering of innovative firms, presence of institutions, presence of quality creative work force as well as other location specific factors such as regulation have a significant interplay in the literature. Managers would do well to study these when optimising their innovation strategy. These can be used as moderating factors when deciding whether or not to undertake open or closed innovation. Further to this, the literature provides significant insight into the factors surrounding the success of user driven innovation. Practitioners would do well to synthesise these various innovative strands based on the findings of the sample in order to optimise a multi-faceted innovation strategy and enhance competitive advantage in the highly subjective VGI.

6.2. Limitations

Whilst the SLR approach utilised in this review has been shown to methodically capture papers within a defined field [114], there are nonetheless a number of limitations to this study which future studies seeking to build on this work may consider addressing.

Firstly, limiting the sample to studies written in the English language significantly inhibits the study's ability to be entirely comprehensive in this highly globalised field. In light of the growth of certain VG markets, in particular the Chinese [115], it is likely that significant amounts of high-quality literature exist outside the English VGI domain. Therefore, a multi-lingual study would potentially yield further important insights into the VGI.

Whilst the selectivity of restricting sample articles to the AJG list is beneficial in ensuring the high quality of journals represented in this study, there are a number of problems associated with this. For starters, given the relative novelty of the VGI as a studied phenomenon, relevant articles on the subject have been published in journals outside of the AJG list, often in "gaming specific" journals [116]. It would be beneficial to broaden the journal list to include a carefully vetted selection of these gaming specific journals to increase the comprehensiveness of the sample. Furthermore, developing nations are underrepresented in the sample. The key countries of focus, outlined in Section 3.3., are exclusively developed nations and China. This could be explained by the relative lack of highly regarded institutions in developing nations. However, this perception of institutional deficiency does not necessarily correlate with reality. The inclusion of studies on the VGI in emerging nations would certainly augment the completeness of this sample. Therefore, the careful selection of articles from journals not on the AJG list, from high-quality developing nation institutions, could improve the resolution of the study.

Furthermore, whilst the Web of Science is a very large database, it is not entirely comprehensive and so relevant articles may have been omitted. Therefore, in order to capture an even greater width of studies it might behove future researchers on this topic to draw from additional databases.

Whilst the search term operators used in this study demonstrably achieved a high-quality working sample of VG literature, it is conceivable that they could be further improved. An elaborate set of Boolean operators and search terms could capture additional residual papers missed out by these search terms. However, in order to remain robust, they must necessarily continue to exclude the enormous quantity of irrelevant papers which could be potentially captured by the ubiquitous use of keywords such as "game" and "industry".

7. Directions for future research

A summary of this study's contribution to the field is most succinctly demonstrated through the VGI Framework (as in Fig. 4). This framework outlines the procedural linkages between the key concepts in the VGI literature. As well as being of potential use to practitioners seeking to understand the linkages within the industry, the framework can also be utilised in order to ascertain the key research gaps and areas for further study. With the VGI Framework as a guide, the following sections discuss future research trajectories for each of the key themes highlighted: platform product ecosystems; monetisation strategies; user psychology and consumer marketing; innovation management; overall business model survivability/sustainability. These directions are summarized in Table 1.

7.1. Product ecosystems

One of the central concerns emergent from the literature is the concept of product ecosystems, especially in the context of the way in which complementary goods (predominantly VGs) interact with a platform system (a console). Most studies have generally approached this phenomenon from either a platform provider or publisher perspective. Given the central concern of the interplay between these two sides of the Two-Sided Market concept [117], future research should seek to integrate the two perspectives in order to ascertain optimal positioning for mutual VG sales performance success. Furthermore, the relevant factors such as platform maturity, base user installation, product quality, genre, the presence of multi-homing and availability of complementary goods could be holistically examined as variables relating to sales performance success. Additionally, whilst the net effects of cannibalisation on both intergenerational and intra-platform products have been conducted, integrative studies which seek understanding of this phenomenon in the context of the aforementioned factors represents a potentially fruitful avenue of future research.

7.2. Monetisation strategies

The novelty and breadth of the monetisation options available to the VGI, has meant that extant literature on the subject is relatively nascent. Whilst earlier studies focussed on price points and bundling strategies for traditional PoS VG products, contemporary studies almost entirely eschew this in favour of modern pricing strategies such as "Loot Boxes"

Table 1
Summary of future research directions.

Theme	Future Research Directions
7.1 Product Ecosystems	- Integrate and investigate the two perspectives (platform provider and publisher) in order to ascertain optimal positioning for mutual VG sales performance success. - Explore net effects of cannibalization considering key factors such as platform maturity, base user installation, product quality, genre, the presence of multi-homing and availability of complementary goods.
7.2 Monetisation Strategies	- Delineate situational benefits of nuances in pricing strategies - Integrate human behavioral psychology findings with monetization research
7.3 User Psychology and Consumer Marketing	- Investigate ethical consequences of VG design - Synthesize findings from gambling addiction and predatory monetization - Examine social and cognitive impact of VGI on different users - Factor in different interpretations of variables in marketing strategy
7.4 Innovation Management	- Delineate factors for user-entrepreneurship success - Explore open innovation in the context of the VGI - Understand HR requirements and synthesis with other creative industries
7.5 Business Model Survivability/Sustainability	- Investigate influence of market demographics on sustainability - Explore cross-industry insights in regard to new business models - Analyze industry-specific factors unique to the VGI - Conduct longitudinal studies to track industry trends
7.6 Methodology-related Future Research Direction	- Explore intersection of game industry research and business/management - Investigate transferability of concepts between traditional business domains - Study the impact of emerging trends and technologies on the VGI

and “Freemium”. Preliminary studies have tended to show the efficacy of these strategies in rent seeking activities. However, these studies have highlighted nuance in how these strategies might be undertaken such as randomised, semi-randomised or predictive rewards systems [73]. In terms of maximising rent-seeking capability from these strategies, further research must delineate the situational benefits of each of these nuances for sales performance optimisation. However, given the CSR implications of these new strategies, outlined in Sections 4.2. and 4.3., future research must seek to integrate human behavioural psychology findings, such as those featured in this study [115], with extant and future research on monetisation methods in order to capture the implications of both sides of this equation.

7.3. User psychology and consumer marketing

In relation to the implications of the previous two sections on product design and pricing, future research on the ethical consequences of various VG designs must be undertaken. Whilst preliminary research such as that done by Cheung et al. [60], has laid some foundations for inquiry into the complex psychological phenomena associated with certain VG characteristics, this research is still in its infancy. Future research trajectories could include the synthesis and integration of other fields of study such as those in the fields of gambling addiction [118] or predatory monetisation in other digital arenas such as social media [119]. Whilst it is important that future studies seek VG UX optimisation, likely through the lens of behavioural psychology, it is imperative that these are contextualised on a solid ethical foundation. Sales and engagement performance should not be achieved at the expense of people’s health and safety. This is not simply a consideration of basic human decency, but is increasingly being acknowledged as a necessary consideration for business success in the latest CSR understanding [120]. Ethical considerations borne of psychology literature could be fruitfully synthesised with the concerns of Sections 5.3 in future research endeavours. There is also a scope for future studies to examine the social and cognitive impact of VGI on different users.

In terms of consumer marketing, the extant literature explores the innovative ways in which the VGI has leveraged modern marketing channels such as online streaming and game reviews in order to augment firms’ marketing strategies. However, these studies are unintegrated and the effects of the relationships between the moderators in these studies have not been studied. Future research in this domain would benefit from factoring in different interpretations of these variables as antecedents to overall VGI marketing strategy success.

7.4. Innovation management

Innovation management is a broad and widely covered field [121]. However, in the considerably narrower context of the VGI there are some key emergent themes which are relatively peculiar to the VGI.

The concept of user-producers for example is a relatively novel concept in this context and the literature lays the foundations of research into the variety of factors which influence the success or failure of *user entrepreneurship*. The studies highlight the engagement of the user base, the availability of social software which would allow user-entrepreneurs to create value for firms, the ability of firms to monitor their community (User Community Sensing). Despite the emergent efficacy of user-entrepreneurship in the realms of innovation management, the literature on this matter is still relatively sparse. Therefore, future research must work to more clearly delineate the factors relating to the success of user-entrepreneurship, as well begin to understand the relationships between these factors in order to optimise innovative performance.

The concept of open innovation and innovative/creative clusters is not unique to the VGI alone. However, given the intricately interconnected nature of the various aspects of VG production, such as art, music, storytelling, technological capability and a general understanding of human entertainment, the nature of how open innovation may be leveraged in this domain is something future research should consider. Whilst the studies in this sample did demonstrate certain antecedents to innovation success, such as strength of network ties, the presence of other innovative firms, location-based regulation and access to skilled HR, there was no study which sought to link these factors in the context of the VGI specifically. Future research projects may consider situationally positioning these factors on a VGI firm, set of firms or product system and try to understand their effects in greater detail.

Finally, the aforementioned unique character of the VGI in the context of innovation, requires a unique understanding of the HR requirements. A small number of studies in the sample inquired into optimisation of recruitment, whilst controlling for location. However, these studies do not sufficiently explain the phenomenon of HRM in the VGI. Future research should attempt to synthesise studies from outside the VGI field, such as HRM in other creative industries. Whilst other industries tend not to exhibit the same plurality of roles that the VGI does, breaking down HRM into the constituent elements present in the VGI (art, technology development etc.) could represent the beginnings of a deeper understanding of the topic.

7.5. Overall business model survivability/sustainability

By analysing the empirical literature, we identified several avenues for future research concerning the business mode innovation. *Investigating the Impact of Market Demographics*: Further research can explore the influence of market demographics, such as internet access and wealth, on the sustainability and performance of video game business models [110]. This could involve examining how varying levels of

internet penetration or socioeconomic factors affect consumer behavior, market demand, and profitability within the VGI. *Exploring Cross-Industry Insights*: Given the potential overlap in concepts, such as mergers and acquisitions (M&A) strategy, between the VGI and broader business management literature, future studies can draw upon insights from other industries to enhance our understanding of these topics. Examining case studies or conducting comparative analyses could reveal valuable lessons applicable to the unique context of the VGI.

Examining Unique Factors in the VGI: While macro factors play a significant role in business model survivability/sustainability, it is essential to delve deeper into the industry-specific factors that distinguish the VGI. More specifically, research can focus on identifying and understanding these nuances, such as the influence of technological advancements, gamer communities, intellectual property rights, or platform dynamics, and their implications for the sustainability of video game business models. Finally, more research is needed to investigate the industry trends. Conducting longitudinal studies that track the evolution of video game business models over time can offer insights into their sustainability and adaptation strategies. Analyzing industry trends, emerging technologies, market shifts, and consumer preferences can inform future research on how video game companies navigate the dynamic landscape of the VGI.

7.6. Methodology-related future research direction

While our current study focused on a specific subset of research within the VGI that aligns with business and management studies, there is an intriguing avenue for future research that could further investigate the broader landscape of game industry research. One potential future research direction is to explore the intersection of game industry research and business and management studies within the VGI. This would involve examining the diverse range of research that falls under the umbrella of the game industry, including areas such as game design, game development, player behavior, and industry trends. By adopting a multidisciplinary approach, researchers could delve into the connections and synergies between the game industry and various business and management concepts. This future research direction would involve expanding the search terms and inclusion criteria to encompass a broader set of publications beyond the AJG-listed journals. By casting a wider net, researchers could gain valuable insights into the holistic understanding of the game industry, including its social, cultural, technological, and economic dimensions.

Furthermore, investigating the relationship between game industry research and business and management studies could shed light on the potential transferability and applicability of concepts, theories, and practices from traditional business domains to the dynamic and evolving landscape of the VGI. This exploration could lead to valuable contributions in terms of strategy formulation, marketing approaches, innovation management, and organizational structures within the game industry.

Additionally, future research could investigate the impact of emerging trends and technologies (by incorporating the terms virtual reality, augmented reality, esports, and blockchain) on the development of the VGI. Understanding how these advancements shape the industry and create new opportunities and challenges would provide valuable insights for practitioners and policymakers.

8. Conclusion

In conclusion, this study contributes to the VGI literature by providing a comprehensive overview, conceptual framework, and identification of key research gaps. Moving forward, there is a need for further contextualization, theoretical integration, and geographic coverage to revitalize and advance research in this important field. By addressing these challenges, future studies can enhance our understanding of the VGI and its evolving dynamics, ultimately benefiting both researchers and industry practitioners.

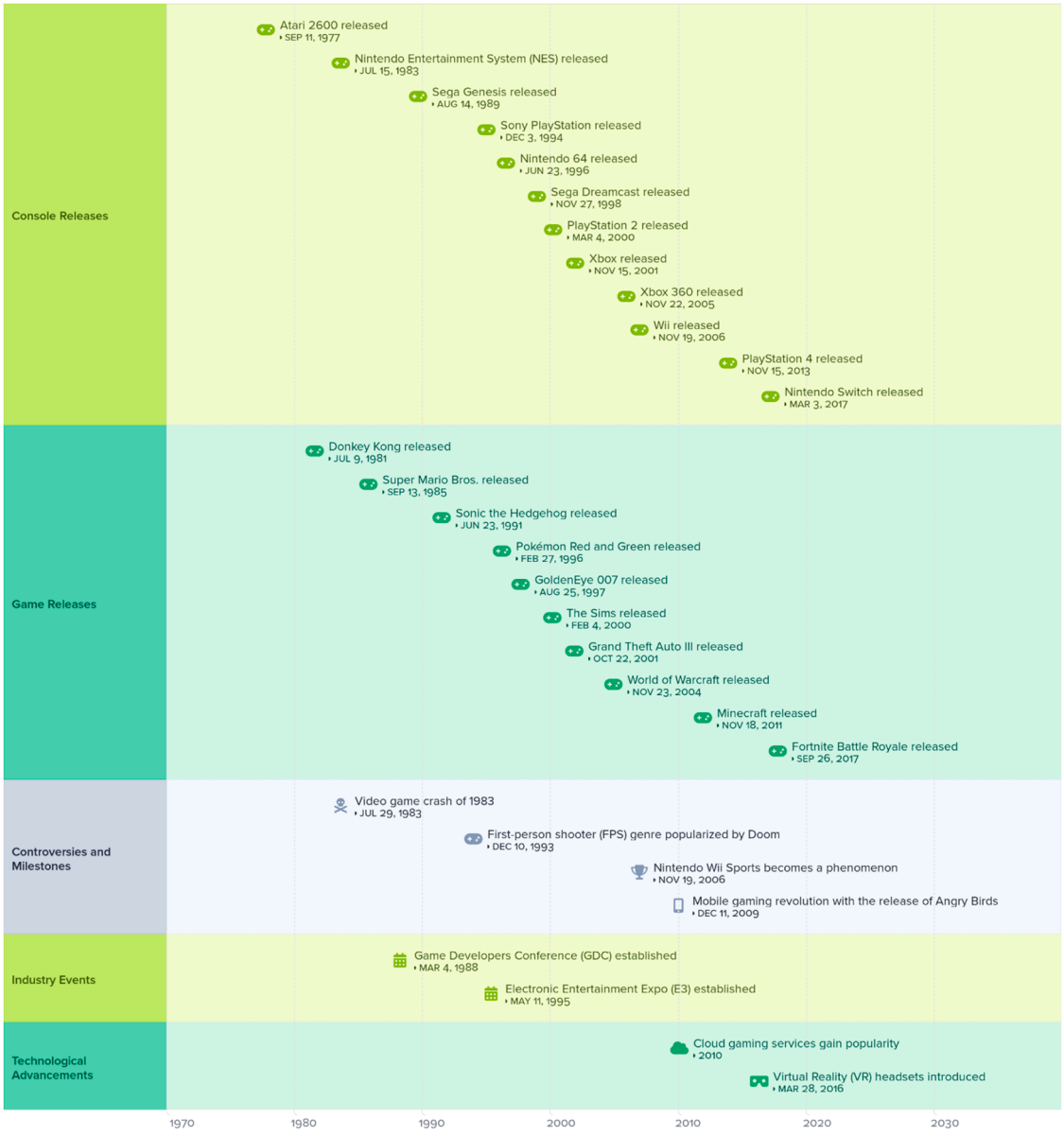
Declaration of Competing Interest

We declare that we have no conflicts of interest in the publication of this research paper. None of the authors have any financial or personal relationships with other people or organizations that could inappropriately influence or bias the work presented in this paper. All sources of funding for this research are disclosed in the acknowledgments section of the paper.

Data availability

Data will be made available on request.

Appendix A. a timeline for the VGI



Appendix B. : summary of studies included in the sample

Index	Title	Authors	Year	Journal
1	Vertical Integration and Exclusivity in Platform and Two-Sided Markets	R. S. Lee	2013	American Economic Review
2	Video game demand in Japan: a household data analysis	N. Harada	2007	Applied Ergonomics
3	The Implications of the Value Chain and Financial Institutions for Work and Employment: Insights from the Video Game Industry in Poland, Sweden and Germany	C. Teipen	2016	British Journal of Industrial Relations
4	The macro problem of microtransactions: The self-regulatory challenges of video game loot boxes	M. McCaffrey	2019	Business Horizons
5	Content is king - But who is the king of kings? The effect of content marketing, sponsored content & user-generated content on brand responses	Muller and Christandl	2019	Computers in Human Behaviour
6	Loot boxes in Spanish adolescents and young adults: Relationship with internet gaming disorder and online gambling disorder	Gonzalez-Cabrera et al.	2022	Computers in Human Behaviour
7	Bringing transparency and trustworthiness to loot boxes with blockchain and smart contracts	A. Carvalho	2021	Decision Support Systems
8	The Downside of Social Capital in New Industry Creation	de Vaan et al.	2019	Economic Geography
9	Promoting sales of online games through customer engagement	Cheung et al.	2015	Electronic Commerce Research & Applications
10	Evaluating the use of internet search volumes for time series modeling of sales in the Video Game Industry	Ruohonen and Hyrynsalmi	2017	Electronic Markets

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Index	Title	Authors	Year	Journal
11	Opening your product: impact of user innovations and their distribution platform on video game success	S. Koch and M. Bierbamer	2016	Electronic Markets
12	Innovate or game over? Examining effects of product innovativeness on video game success	Handrich et al.		Electronic Markets
13	Tackling the crunch mode: the rise of an enterprise union in South Korea's game industry	Chung and Kwon	2020	Employee Relations
14	When regional meets global: exploring the nature of global innovation networks in the Video Game Industry in Southern Sweden	Chaminade et al.	2021	Entrepreneurship and Regional Development
15	Stakeholder data analysis in the video gaming industry: implications for regional development	Belyaeva et al.		Euromed Journal of Business
16	Option chain and change management: A structural equation application	T. Burger-Helmchen	2009	European Management Journal
17	Policies for Creative Clusters: A Comparison between the Video Game Industries in Melbourne and Montreal	S. Darchen and D. G. Tremblay	2015	European Planning Studies
18	Indirect Network Effects and Platform Dominance in the Video Game Industry: A Network Perspective	Srinivasan and Venkatraman	2010	IEEE Transactions on Engineering Management
19	From business ecosystems to ecosystems of innovation: the case of the Video Game Industry in Montreal	Cohendet et al.	2021	Industry and Innovation
20	Bounded careers in creative industries: Surprising patterns in video games	Casper and Storz	2017	Industry and Innovation
21	In-house publishing and competition in the Video Game Industry	T. P. Thomes	2015	Information Economics and Policy
22	Analyzing Pricing Strategies for Online Services with Network Effects	Pang and Etzion	2012	Information Systems Research
23	Manufacturer's "1-Up" from Used Games: Insights from the Secondhand Market for Video Games	Kim et al.	2021	Information Systems Research
24	Level Up: Leveraging Skill and Engagement to Maximize Player Game-Play in Online Video Games	Huang et al.	2019	Information Systems Research
25	Platform Architecture and Quality Trade-offs of Multihoming Complements	Cennamo et al.	2018	Information Systems Research
26	Platform Performance Investment in the Presence of Network Externalities	Anderson et al.	2014	Information Systems Research
27	EXPLORATION VS. EXPLOITATION AND HOW VIDEO GAME DEVELOPERS ARE ABLE TO COMBINE THE TWO	Wikhamn et al.	2016	Journal of Innovation Management
28	EFFECTS OF USER COMMUNITY SENSING CAPABILITY IN DIGITAL PRODUCT INNOVATION: EVIDENCE FROM THE VIDEO GAME INDUSTRY	Peter and Sorhammar	2022	Journal of Innovation Management
29	GENRES OF COMPLEMENTARY PRODUCTS IN PLATFORM-BASED MARKETS: CHANGES IN EVOLUTIONARY MECHANISMS BY PLATFORM DIFFUSION STRATEGIES	Inoue and Tsujimoto	2018	Journal of Innovation Management
30	ALONE OR IN COOPERATION: WHAT IS THE BEST STRATEGY FOR THE PERFORMANCE OF RADICAL PRODUCT INNOVATION IN THE VIDEO GAME INDUSTRY?	R. Hamouti	2021	International Journal of Innovation Management
31	The power of an installed base to combat lifecycle decline: The case of video games	A. Marchand	2016	International Journal of Research Marketing
32	The effects of installed base innovativeness and recency on content sales in a platform-mediated market	J. Healey and W. W. Moe	2016	International Journal of Research Marketing
33	Predatory Monetisation? A Categorisation of Unfair, Misleading and Aggressive Monetisation Techniques in Digital Games from the Player Perspective	Petrovskaya and Zendle		Journal of Business Ethics
34	Do LGBTQ-Supportive Corporate Policies Affect Consumer Behavior? Evidence from the Video Game Industry	Parshakov et al.		Journal of Business Ethics
35	Spillover effect in promotion: Evidence from video game publishers and eSports tournaments	Parshakov et al.	2020	J. Bus. Res.
36	A dual identification framework of online multiplayer video games: The case of massively multiplayer online role playing games (MMORPGs)	Badrinarayanan et al.	2015	J. Bus. Res.
37	Strategic entrepreneurship's dynamic tensions: Converging (diverging) effects of experience and networks on market entry timing and entrant performance	E. Y. Zhao, M. Ishihara and P. D. Jennings	2020	Journal of Business Venturing
38	Modelling consumer entertainment software choice: An exploratory examination of key attributes, and differences by gamer segment	S. Prugsamatz, B. Lowe and F. Alpert	2010	Journal of Consumer Behaviour
39	A duration model analysis of consumer preferences and determinants of video game consumption	D. Kaimann, N. Stroh-Maraun and J. Cox	2018	Journal of Consumer Behaviour
40	How do reviews from professional critics interact with other signals of product quality? Evidence from the Video Game Industry	J. Cox and D. Kaimann	2015	Journal of Consumer Behaviour
41	Clustering and firm performance in project-based industries: the case of the global Video Game Industry, 1972-2007	De Vaan et al.	2013	Journal of Economic Geography
42	The local, the global and the industry common: the case of the Video Game Industry	Cohendet et al.	2018	Journal of Economic Geography
43	The dynamics of interfirm networks along the industry life cycle: The case of the global Video Game Industry, 1987-2007	P. A. Balland, M. De Vaan and R. Boschma	2013	Journal of Economic Geography
44	Korean Online Game's Platform Competition under Two-Sided Market Characteristic	S. Kang and S. Y. T. Lee	2014	Journal of Global Information Management
45	Value Creation in the Video Game Industry: Industry Economics, Consumer Benefits, and Research Opportunities	A. Marchand and T. Hennig-Thurau	2013	Journal of Interactive Marketing
46	Advertising and Word-of-Mouth Effects on Pre-launch Consumer Interest and Initial Sales of Experience Products	H. Kim and D. M. Hanssens	2017	Journal of Interactive Marketing
47	Digital consumer networks and producer-consumer collaboration: Innovation and product development in the Video Game Industry	R. Y. Arakji and K. R. Lang	2007	Journal of Management Information Systems
48	Great Successes and Great Failures: The Impact of Project Leader Status on Project Performance and Performance Extremeness	Szatmari et al.	2021	Journal of Management Studies
49	Follow the Crowd or Follow the Trailblazer? The Differential Role of Firm Experience in Product Entry Decisions in the US Video Game Industry	H. Ozalp and T. Kretschmer	2019	Journal of Management Studies
50	Impact of Online Consumer Reviews on Sales: The Moderating Role of Product and Consumer Characteristics	F. Zhu and X. Q. Zhang	2010	Journal of Marketing

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Index	Title	Authors	Year	Journal
51	Multihoming in Two-Sided Markets: An Empirical Inquiry in the Video Game Console Industry	Landsman and Stremersch	2011	Journal of Marketing
52	The Effect of Superstar Software on Hardware Sales in System Markets	J. L. G. Binken and S. Stremersch	2009	Journal of Marketing
53	Halo or Cannibalization? How New Software Entrants Impact Sales of Incumbent Software in Platform Markets	Allen et al.	2022	Journal of Marketing
54	Dynamics of Pricing in the Video Game Console Market: Skimming or Penetration?	H. J. Liu	2010	Journal of Marketing Research
55	Parental Restrictive Mediation and Children's Violent Video Game Play: The Effectiveness of the Entertainment Software Rating Board (ESRB) Rating System	R. N. Laczniak, L. Carlson, D. Walker and E. D. Brocato	2017	Journal of Public Policy & Marketing
56	Why Quality May Not Always Win: The Impact of Product Generation Life Cycles on Quality and Network Effects in High-tech Markets	R. T. Gretz and S. Basuroy	2013	Journal of Retailing
57	What online game spectators want from their twitch streamers: Flow and well-being perspectives	M. Kim and H. M. Kim	2022	Journal of Retailing and Consumer Services
58	Does playing a video game really result in improvements in psychological well-being in the era of COVID-19?	M. Kim	2021	Journal of Retailing and Consumer Services
59	User entrepreneurship in the Video Game Industry: the role of communities	Del Bosco et al.	2020	Journal of Small Business and Enterprise Development
60	The impact of superstar and non-superstar software on hardware sales: the moderating role of hardware lifecycle	Gretz et al.	2019	Journal of the Academy of Marketing Science
61	A multigeneration diffusion model for IT-intensive game consoles	K. Altinkemer and W. Q. Shen	2008	Journal of the Association for Information Systems
62	Platform selection by software developers: Theory and evidence	Maruyama et al.	2015	Journal of the Japanese and International Economies
63	User Communities and Social Software in the Video Game Industry	T. Burger-Helmchen and P. Cohendet	2011	Long Range Planning
64	Bayesian Estimation of a Dynamic Model of Two-Sided Markets: Application to the US Video Game Industry	Y. Y. Zhou	2017	Management Science
65	Loot Box Pricing and Design	Chen et al.	2021	Management Science
66	Mixed Bundling in Two-Sided Markets in the Presence of Installed Base Effects	Y. Chao and T. Derdenger	2013	Management Science
67	Variety in the Video Game Industry: An empirical study of the Wundt curve	Kaimann et al.	2018	Managerial and Decisions Economics
68	Network externalities in online video games: an empirical analysis utilizing online product ratings	Liu et al.	2015	Marketing Letters
69	Places, Spaces and the Dynamics of Creativity: The Video Game Industry in Montreal	Grandadam et al.	2013	Regional Studies
70	Under the radar: Industry entry by user entrepreneurs	Haefliger et al.	2010	Research Policy
71	Interfirm networks in periods of technological turbulence and stability	M. de Vaan	2014	Research Policy
72	New horizons or a strategic mirage? Artist-led-distribution versus alliance strategy in the Video Game Industry	Broekhuizen et al.	2013	Research Policy
73	Organizational innovativeness and coopetition: a study of video game developers	Klimas and Czakon	2018	Review of Managerial Science
74	Consecrating video games as cultural artifacts: Intellectual legitimation as a source of industry renewal	Styhre et al.	2018	Scandinavian Journal of Management
75	Factors influencing technological innovation efficiency in the Chinese Video Game Industry: Applying the meta-frontier approach	Xi et al.	2022	Technological Forecasting and Social Change (TFSC)
76	Welfare and fairness in free-to-play video games	J. M. Sanchez-Cartas	2022	(TFSC)
77	Business model innovation in video-game consoles to face the threats of mobile gaming	Lantano, et al.	2022	(TFSC)
78	New market development of platform ecosystems: A case study of the Nintendo Wii	Inoue and Tsujimoto	2018	(TFSC)
79	The impacts of game experience and fanwork creation on game loyalty: Mediation effect of perceived value	Cui et al.	2022	(TFSC)
80	Grey theory analysis of online population and online game industry revenue in Taiwan	Chang et al.	2013	(TFSC)
81	Exploring survival rates of companies in the UK video-games industry: An empirical study	Cabras, et al.	2017	(TFSC)
82	Capability reconfiguration of incumbent firms: Nintendo in the Video Game Industry	Subramanian et al.	2011	Technovation
83	Risk-taking behavior of technology firms: The role of performance feedback in the Video Game Industry	Situmeang et al.	2016	Technovation
84	Vertical vs horizontal coopetition and the market performance of product innovation	Le Roy et al.	2022	Technovation

Appendix C. : key themes of the VGI Industry, their definitional boundary and key studies from the sample

Key Theme of VGI	Definition	Key Studies from the Sample
Product Ecosystems, Two-Sided Markets and the Unique Nature of the VGI's Product Offerings	Studies which focus on the unique product systems of the VGI and how firms and users interact with this to two-sided platform ecosystem	[41,49,50,53,57–68]
Monetisation Strategies	Studies which focus on the novel monetisation strategies available to VGI firms including ethical considerations	[7,15,69-77]
Consumer Psychology and Marketing	Studies which address video game user psychology and consumer marketing, usually at the individual level	[1,45,47,60–63,69,77–87]
Innovation in the VGI	Studies which cover the various unique ways in which innovation is undertaken and optimised in the context of the VGI	[8,11,15,17,44,52,56–58, 91–93,95–100,102–108]
Overall VGI Business Model Survivability/Sustainability	Studies which address the overall business models of VGI firms and the physical and conceptual landscape they inhabit	[10]; Zhou (2020), [111,110, 112]

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