5G and Mobile Gaming in Indonesia: Digital Acceleration and Governance in Emerging Urban Markets

Robby Yandy*

Hasanuddin University, Makassar, Indonesia
*yandyr24a@student.unhas.ac.id

Abstract. The rapid deployment of 5G technology is reshaping the digital landscape, with mobile gaming emerging as a prime beneficiary due to its sensitivity to speed, latency, and real-time interactivity. This study examines the implementation of 5G in Makassar, Indonesia, focusing on user experiences, industry opportunities, and structural challenges. A mixed-methods approach was adopted, combining survey data from 146 mobile gamers with qualitative interviews from eight key industry stakeholders. Findings indicate that 5G networks significantly enhance gameplay quality through reduced latency, improved download speeds, and greater stability. These technological advancements correlate with increased immersion, monetisation activity, and participation in mobile eSports ecosystems. However, infrastructural limitations, device affordability, and cybersecurity awareness remain pressing barriers to inclusive adoption. The study also employs the Technology-Organisation-Environment (TOE) framework to analyse behavioural shifts and strategic implications for digital transformation. A SWOT analysis reveals both the transformative potential and systemic constraints of 5G in a developing urban context. These results underscore the critical need for integrated policy, infrastructure investment, and public education to fully leverage 5G's capabilities in the gaming sector.

Keywords: 5G technology, mobile gaming, digital transformation, user experience; Indonesia, Technology-Organisation-Environment (TOE)

1 Introduction

The deployment of fifth-generation (5G) technology has brought significant transformations across digital industries, enabling a new era of intelligent, high-performance applications. Among these, mobile gaming has emerged as a key beneficiary of 5G, due to its high dependency on network speed, latency sensitivity, and real-time interaction requirements. Industry 5.0 paradigms suggest that immersive technologies, supported by edge computing and ultra-reliable connectivity, will redefine user engagement and content delivery [1]. Mobile gaming, as one of the fastest-growing segments in the digital economy, stands at the centre of this shift.

In technologically advanced markets, 5G has been shown to substantially improve the quality of experience (QoE) for mobile gamers by reducing lag, enhancing graphics rendering, and enabling cloud-based services. Baena et al.[2] present empirical evidence that 5G provides a robust foundation for multiplayer gaming and live game

M. Nohong et al. (eds.), *Proceedings of the 10th International Conference on Accounting, Management, and Economics (10th ICAME 2025)*, Advances in Economics, Business and Management Research 388,
https://doi.org/10.2991/978-94-6239-709-5_2

streaming, supported by edge capabilities and network slicing. Baek et al. [3] demonstrate that the commercialisation of 5G-enabled mobile gaming in South Korea has introduced new business models, including subscription-based gaming, microtransactions, and hybrid eSports tournaments. These innovations are sustained by a stable digital infrastructure and high user readiness.

However, in developing countries, the implementation of 5G remains inconsistent. Despite regulatory ambitions and pilot deployments, challenges persist in infrastructure availability, device affordability, and user awareness. Alsulami and Suryanegara [4, 5] emphasise that spectrum management, cybersecurity policy, and unequal urban-rural rollout hinder the widespread adoption of 5G. Forge et al. [6] further argue that policy alignment in emerging economies is often reactive rather than anticipatory, leading to delayed service maturity. While macro-level studies offer valuable insights, there remains a shortage of context-specific research focusing on localised user experience, behavioural shifts, and industry adaptation in Southeast Asian cities.

This study responds to that gap by examining the implementation of 5G in the mobile gaming sector within Makassar, Indonesia. Using the Technology-Organization-Environment (TOE) framework, the study investigates how technological features, organisational contexts, and environmental readiness interact to influence user experience and digital business potential. The TOE model has been validated in digital transformation research and is especially suitable for analysing innovations such as 5G, which are embedded within multi-layered ecosystems [1, 7]. By focusing on mobile gamers as end-users and capturing industry perspectives from telecom operators and digital creators, this study offers a holistic assessment of 5G adoption in a mid-sized urban economy.

The study adopts a mixed-methods approach. Quantitative data were collected from 146 mobile gamers, and qualitative interviews were conducted with key informants from the telecommunications, gaming, and regulatory sectors. In doing so, this research combines the strengths of user perception analysis and industry insight, following calls from Attaran and Bagaa et al. [8, 9] for more integrative perspectives in digital technology adoption studies.

2 Literature Review

The expansion of 5G technology has introduced fundamental changes to the mobile gaming industry by enhancing user performance, creating new business models, and enabling infrastructure-intensive services. As researchers examine the impact of 5G on digital sectors, mobile gaming has become a notable case due to its dynamic user base, fast-paced technological requirements, and strong reliance on low-latency connectivity. This section reviews the relevant academic discourse that supports the dimensions analysed in this study, drawing primarily from recent research that aligns with the Technology-Organization-Environment (TOE) framework adopted in the theoretical model.

The literature strongly agrees that 5G brings substantial technological improvements, particularly in reducing latency, increasing data throughput, and

ensuring stable connections. These features are critical in mobile gaming where real-time responsiveness defines the user experience. Baena et al. [2] describe 5G as the cornerstone of future mobile gaming infrastructure, particularly for cloud-based environments and multiplayer formats that require synchronous interaction. Their study confirms that 5G enables immersive and uninterrupted experiences by eliminating lag, supporting high-definition rendering, and allowing seamless content updates. These insights are reinforced by Lessi et al. [1], who explain that network slicing and distributed computing capabilities within 5G systems improve performance consistency during congestion periods. This corresponds closely with findings from the present study, where participants reported clear improvements in download speed, latency, and connection reliability in a real-world urban setting.

A number of studies have also explored how 5G influences user engagement through its support for advanced gaming features. Attaran [8] argues that the psychological immersion experienced by users is largely determined by the network's capacity to deliver immediate feedback and high-resolution interactions. This argument is validated by the current research, which shows that control responsiveness and visual quality are positively associated with higher levels of gameplay satisfaction. The shift in user behaviour, including prolonged gaming time and deeper involvement in interactive content, mirrors trends observed in South Korea and China, where 5G has already reached widespread adoption [3].

In terms of economic potential, 5G is credited with enabling diverse monetisation strategies such as in-app purchases, subscription gaming, and real-time event participation. These developments are supported by M et al. [10], who document the emergence of Gaming-as-a-Service (GaaS) as a viable business model driven by 5G's ability to deliver on-demand access to content and services. The findings from this study support these conclusions, particularly through indicators that show increased user willingness to invest in gaming-related digital transactions. It is evident that a more responsive and reliable network encourages user trust in premium features, which in turn expands the commercial viability of mobile games.

Despite the clear opportunities afforded by 5G, implementation challenges remain a recurring concern in the literature. Several authors have identified infrastructural disparities and policy bottlenecks as primary obstacles in developing regions. Alsulami [4] notes that inconsistent network roll-out and the high cost of 5G-compatible devices contribute to uneven adoption rates. This is particularly relevant in secondary cities such as Makassar, where respondents in this study cited unstable coverage and affordability concerns. Forge et al. [6] similarly caution that national-level regulatory frameworks are often unprepared to support the agile infrastructure and spectrum allocation required by next-generation networks. The regulatory inertia observed in the Indonesian context echoes the challenges described by Suryanegara [5], who advocates for more adaptive policy ecosystems.

Another limitation that has surfaced is the lack of user awareness regarding cybersecurity and digital risk. While technological performance improves, many users remain unaware of potential threats associated with cloud gaming, data exposure, and identity theft. Wang et al. [11] is report that the average mobile gamer exhibits limited understanding of how their data is processed and stored in 5G environments. This

resonates with results from the present study, in which the cybersecurity dimension received the lowest scores across all constructs, suggesting that digital infrastructure must be matched by education and protective regulation to ensure safe user participation.

Importantly, the theoretical frameworks employed in the literature provide consistent support for this study's methodological approach. Many researchers, including Lessi et al. and Anh [1, 7], apply the TOE framework to analyse how technological benefits, organisational readiness, and environmental constraints collectively shape innovation adoption. These frameworks facilitate a multi-dimensional understanding of 5G implementation that goes beyond hardware and connectivity, and into user behaviour, business capability, and policy environments. The present study builds on this tradition by integrating both quantitative and qualitative evidence to construct a more complete narrative of 5G's role in digital transformation, particularly in an emerging urban economy. The TOE framework used in this study is illustrated in Figure 1.

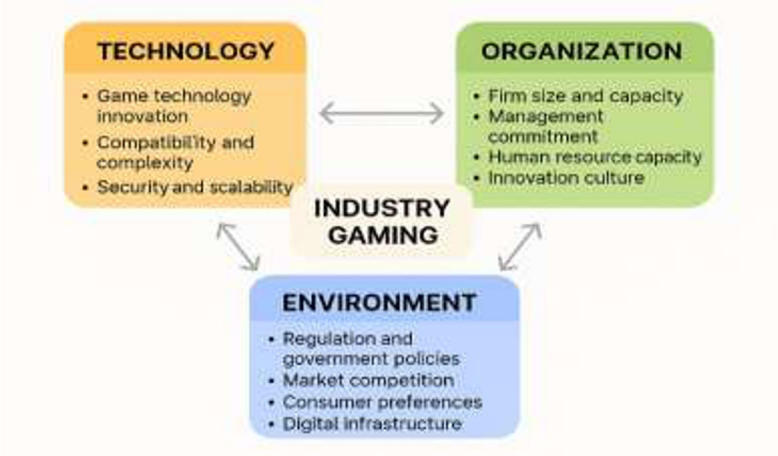

Fig. 1. TOE Framework

3 Methodology

This study employed a mixed-methods approach to examine the implementation of 5G technology in the mobile gaming industry in Makassar, Indonesia. The rationale for selecting this approach is grounded in the objective to capture both quantifiable user perceptions and rich contextual insights from stakeholders involved in the digital ecosystem. Mixed-methods research provides a systematic way to integrate numeric data with narrative understanding, thus enabling a deeper exploration of the research questions.

Quantitative data were obtained through the distribution of a structured online questionnaire. The target population consisted of Mobile Legends players aged 16 to 35 years who had accessed 5G services through compatible smartphones or SIM cards

for at least one month. Due to the limited penetration of 5G and the uneven availability of compatible devices in Makassar, purposive sampling was used to recruit respondents. While this method does not allow for statistical generalization to the broader population, it was considered suitable for this exploratory study since it prioritized the relevance and appropriateness of respondents to the research objectives. The final sample included 146 respondents, a number deemed sufficient to perform descriptive and correlational analyses with acceptable statistical power for small-scale research, as recommended by Bujang [12].

The questionnaire was structured around five key constructs. These included 5G performance, which measured user perceptions of download speed, latency reduction, and connection stability. User experience was assessed in terms of control responsiveness, graphical quality, and immersion. Digital business opportunities focused on participation in in-app purchases, cloud gaming, and live-streaming events. Implementation challenges examined coverage issues, device affordability, and cybersecurity awareness. Socioeconomic impact explored behavioral shifts such as increased play time, digital spending, and online community involvement. A five-point Likert scale was used across all items, ranging from "strongly disagree" (1) to "strongly agree" (5). A pilot study was conducted with 15 participants to assess the clarity, reliability, and internal consistency of the instrument. All constructs demonstrated Cronbach's alpha values above 0.80, indicating a high degree of reliability as defined by Banda et al. [13].

In parallel with the quantitative strand, qualitative data were collected to provide explanatory depth. Semi-structured interviews were conducted with eight key informants who were selected using expert purposive sampling. These informants represented critical perspectives in the digital gaming and telecommunications sectors, including game developers, network engineers, cybersecurity analysts, and eSports event organizers. The interviews were carried out virtually through Zoom and WhatsApp, and each session lasted between 45 and 60 minutes. All sessions were recorded with participant consent and subsequently transcribed verbatim for analysis.

Quantitative data were analyzed using SPSS version 26. Descriptive statistics, including means, standard deviations, and frequency distributions, were used to summarize the data. Bivariate correlation analysis was applied to examine the relationships between 5G performance and related variables such as user experience and business engagement. In order to interpret the strategic implications of the data, a SWOT analysis was developed based on aggregated responses. This framework was used to organize internal and external factors that influence the adoption of 5G in mobile gaming Kao et al. [14].

The qualitative data were analyzed using thematic content analysis. Transcripts were coded using NVivo software, and emergent themes were organized according to the Technology-Organization-Environment (TOE) framework. The analysis focused on three domains. The first domain was technological affordances, which included perceptions of speed, responsiveness, and bandwidth. The second domain was organizational transformation, emphasizing shifts in monetization strategies, user engagement, and content creation. The third domain was environmental readiness, including insights on regulatory adaptation, cybersecurity preparedness, and equitable

infrastructure access. The integration of both data strands enhanced the credibility of the results through methodological triangulation, as recommended by Braun et al. [15].

Several considerations were made in relation to data limitations. First, the sample was restricted to a single urban location, which may affect the external validity of the findings. Second, the early stage of 5G implementation in Makassar means that user experiences may not fully reflect the long-term effects of widespread adoption. Third, access to 5G-compatible devices was not evenly distributed across socioeconomic groups, which may have influenced user participation and responses. These contextual factors shaped the feasibility of applying probability-based sampling or experimental designs and justify the choice of a mixed-methods framework.

Ethical approval for this research was granted by the Universitas Hasanuddin Research Ethics Committee under reference number 023/ETIK/FISIP/2025. All participants provided informed consent before participating in the study. Data privacy and confidentiality were maintained throughout the research process in accordance with the principles of the Declaration of Helsinki on ethical research involving human subjects.

4 Result

This study presents the empirical findings derived from both quantitative and qualitative data collected during the study. The results are structured around five central themes that align with the Technology-Organization-Environment (TOE) framework: 5G network performance, user experience in mobile gaming, emerging digital business opportunities, technical and organizational challenges, and socioeconomic behavioral shifts among users in Makassar, Indonesia. The measurement model and descriptive statistics for these constructs are presented in Table 1. These findings serve as a factual foundation for the interpretive discussion that follows.

Table 1. Measurement Model and Descriptive Statistics

Construct	Indicator	Mean	St. Dev.	Outer Loading	Cronbach's Alpha	CR	AVE
5G Performance	Download speed	4.326	0.682	0.841	0.856	0.901	0.693
	Latency reduction	4.112	0.746	0.823			
	Connection stability	4.278	0.654	0.849			
User Experience	Control responsiveness	4.441	0.596	0.865	0.879	0.914	0.721
	Graphic quality	4.187	0.671	0.832			
	Game immersion	4.036	0.721	0.847			

Digital Business Potential	In-app purchase engagement	3.914	0.845	0.808	0.841	0.889	0.666
	Participation in eSports	3.826	0.881	0.829			
Implementation Challenges	5G coverage availability	3.236	0.944	0.793	0.812	0.867	0.622
	Device affordability	3.102	1.017	0.812			
	Cybersecurity awareness	2.783	1.119	0.804			
Socioeconomic Impact	Increased game time	4.139	0.774	0.858	0.871	0.909	0.715
	Monthly digital spending	3.736	0.882	0.846			
	Community engagement	3.634	0.916	0.863			

The quantitative survey of 146 respondents revealed a generally high level of satisfaction with the performance of 5G networks in supporting mobile gaming activities. Specifically, participants reported significant improvements in technical aspects such as download speed (M = 4.326, SD = 0.682), latency reduction (M = 4.112, SD = 0.746), and connection stability (M = 4.278, SD = 0.654). These figures suggest that the 5G infrastructure available in Makassar, although not uniformly distributed, has begun to fulfill key technical promises of ultra-low latency and high throughput. This finding is consistent with existing literature which states that 5G enables network speeds exceeding 10 Gbps and latency below one millisecond, facilitating seamless interaction in bandwidth-intensive applications like online multiplayer games [1, 2]. More than 82% of the respondents agreed or strongly agreed that 5G connectivity allowed them to experience faster and more stable gameplay, especially during real-time competitive matches.

In the area of user experience, the responses reflected strong improvements in interactivity and engagement due to 5G-enabled features. Game control responsiveness achieved the highest rating among the indicators (M = 4.441, SD = 0.596), followed by graphic rendering quality (M = 4.187, SD = 0.671) and immersive gameplay (M = 4.036, SD = 0.721). Many respondents indicated that the reduced lag and increased graphical fidelity allowed for smoother gameplay, particularly when engaging in mobile eSports or high-frame-rate matches. These enhancements align with the predicted shift in game design logic under 5G environments, where developers can integrate more complex animations and real-time multiplayer mechanics without the performance bottlenecks observed in 4G environments [8].

As for digital business opportunities, the study observed a moderate but notable shift in monetization behaviors and user engagement with advanced digital services. Engagement in in-app purchases was rated at a mean of 3.914 (SD = 0.845), indicating growing user willingness to invest financially in their gaming experiences. Participation in mobile eSports tournaments, content streaming, or live interactions had a mean score of 3.826 (SD = 0.881). Approximately 76.7% of users acknowledged that 5G

connectivity motivated them to explore more interactive and commercialized forms of gaming such as paid skins, subscriptions, or tournament entry fees. These behaviors are consistent with global industry trends where Gaming-as-a-Service (GaaS) models, virtual item economies, and hybrid monetization strategies are increasingly enabled by high-speed, low-latency networks [3, 10]. Informants from the gaming industry confirmed that stable connectivity under 5G is an essential precondition for these business models to operate at scale.

Despite the technical and economic potential of 5G, respondents and key informants also identified notable challenges that inhibit full-scale adoption and utilization. In terms of infrastructure, the availability of 5G coverage across Makassar scored a relatively moderate mean of 3.236 (SD = 0.944), with 61.0% of users reporting unstable or limited access in peripheral districts. Device affordability, especially among users from lower-income backgrounds, was another barrier, with a mean score of 3.102 (SD = 1.017). Cybersecurity awareness received the lowest mean across all items, scoring 2.783 (SD = 1.119), highlighting that many users remain unaware of the privacy and data protection risks associated with 5G-enabled cloud gaming. These findings echo concerns raised by Alsulami and Suryanegara [4, 5], who argue that the implementation of 5G in developing countries often suffers from infrastructural disparities, limited digital literacy, and delayed policy support for cybersecurity governance.

Socioeconomic changes were also evident in user behavior. Increased gaming duration was observed among 67.8% of respondents, with a mean score of 4.139 (SD = 0.774), suggesting a significant behavioral shift toward more time-intensive digital engagement. Monthly digital spending, including purchases of virtual items, subscriptions, and tournament access, had a mean of 3.736 (SD = 0.882), indicating a moderate rise in the monetization of gaming activity at the individual level. Community participation through live streaming, gaming forums, and tournament attendance was rated at 3.634 (SD = 0.916), reflecting the expanding role of online communities in shaping player identity and involvement. These findings align with regional gaming trends in Southeast Asia, where mobile-first gaming ecosystems and creator-led content economies are reshaping digital engagement [7, 16].

Qualitative insights from the eight key informants reinforced the quantitative trends. Network engineers from telecommunications firms highlighted improvements in Quality of Service (QoS) indicators and reduced congestion during peak usage hours. Game developers noted operational efficiency in deploying content updates and managing user experience at scale. Additionally, stakeholders from the eSports industry reported growing interest in hybrid event formats that combine in-person and real-time online participation. Nonetheless, regulatory experts emphasized the need for more agile governance mechanisms for spectrum allocation and data privacy, given that current frameworks do not yet fully support the demands of 5G-powered services in the gaming sector [6].

Taken together, these results indicate that the implementation of 5G technology in Makassar's mobile gaming sector has yielded both substantial benefits and persistent constraints. The network enhancements have led to improved gameplay experiences and opened avenues for new digital business models, while infrastructural inequity, device costs, and lack of cybersecurity literacy continue to hinder broader inclusion and

impact. A summary of the strengths, weaknesses, opportunities, and threats related to 5G gaming implementation is provided in Table 2.

Table 2. SWOT Summary of 5G Gaming Implementation

Strengths	Weaknesses
• Ultra-low latency improves real-time multiplayer responsiveness • High-speed data supports HD graphics, smooth streaming, and fast downloads • Stable connectivity enables real-time patching, cloud gaming, and hybrid tournaments • Enhanced user experience promotes deeper immersion and satisfaction	• 5G coverage remains uneven, especially in non-central urban areas • High cost of 5G-compatible devices creates access barriers for low-income users • Limited public awareness of data privacy and cybersecurity risks in mobile cloud gaming • Organizational readiness among small-scale game developers remains low
Opportunities	**Threats**
• Expansion of monetization models such as in-app purchases, subscription gaming, and GaaS • Growth of eSports industry through hybrid online–offline tournaments and real-time streaming • Rise of youth-led digital entrepreneurship and localized content creation in the gaming economy • Potential for collaborative innovation between telecom providers, game developers, and government	• Risk of increased cyberattacks and data breaches, especially in cloud-hosted games • Regulatory bottlenecks in spectrum licensing, security, and digital infrastructure planning • Digital divide may widen due to socioeconomic and regional disparities in 5G accessibility • Overdependence on high-performance devices may marginalize non-upgraded users

5 Discussion

The findings of this study offer significant insight into how 5G technology is shaping the mobile gaming industry in Indonesia, particularly within the urban context of Makassar. Drawing from the TOE framework, the results show a multifaceted interplay between technological readiness, organisational adaptation, and environmental context, each of which contributes uniquely to the emerging digital gaming ecosystem.

From a technological perspective, the improved network performance facilitated by 5G deployment, specifically in terms of latency reduction, download speed, and connection stability, has led to more immersive and responsive gameplay. This aligns with existing literature, where 5G is identified as a foundational enabler of bandwidth-

intensive applications and real-time interaction in mobile gaming [1, 2]. The enhancement of game control responsiveness and graphical fidelity reported by users supports the hypothesis that 5G significantly improves Quality of Experience (QoE), reinforcing claims made by Baek et al. [3] regarding future business models for mobile cloud gaming.

Organisational factors also emerged as critical drivers of innovation. The qualitative data revealed that firms with adequate infrastructure and innovation-oriented leadership are more capable of leveraging 5G for product and service delivery. This includes efficient content updates, adaptive cloud streaming, and real-time multiplayer integration. However, limitations in human resource capacity and varying degrees of management commitment were evident, suggesting that organisational readiness is uneven and must be supported by targeted capacity-building efforts. This echoes Attaran [8], who argued that digital transformation requires not just technology but also internal alignment within firms.

The environmental dimension reveals persistent structural challenges that hinder widespread adoption. Infrastructural inequality across city districts, compounded by limited device affordability and cybersecurity awareness, continues to exclude certain demographic segments from participating in 5G-enabled gaming experiences. These findings align with those of Alsulami and Forge et al. [4, 6], who emphasised that policy and regulatory environments in developing economies often lag behind technological advancements. Additionally, consumer preferences in Makassar reflect growing openness to monetised digital experiences, yet they also signal potential saturation and fatigue among users if access remains uneven.

Behavioural shifts observed among respondents further underscore the transformative potential of 5G. Increased gaming duration, higher digital spending, and expanded community participation all suggest that users are not only consuming but also co-creating value in the gaming ecosystem. This resonates with the concept of gamified economies and player-driven platforms, as highlighted by Anh [7] in the Southeast Asian context. The data also reveal early signals of a transition toward hybrid digital lifestyles, wherein mobile gaming intersects with social, financial, and cultural domains of user life.

The interaction between these three dimensions, technology, organisation, and environment, highlights the complexity of implementing 5G in a way that is both innovative and inclusive. While the benefits are evident, the sustainability of 5G integration into the gaming sector will depend on continued infrastructure investment, agile policy frameworks, and equitable access strategies. The TOE framework proved effective in capturing these dynamic relationships, validating its relevance in contemporary digital adoption studies.

6 Conclussion

This study has explored the implementation of 5G technology in Indonesia's mobile gaming sector, focusing on the city of Makassar as a representative urban context. Through a mixed-methods approach combining quantitative survey and qualitative

interviews, the research highlights both the transformative potential and persistent barriers associated with 5G adoption. Users reported enhanced technical performance, including lower latency and more stable connectivity, which contributed to a more immersive and responsive gaming experience. These outcomes further enabled increased engagement in digital monetisation channels such as in-app purchases, live streaming, and competitive mobile eSports.

The findings have strong implications for practical implementation. Telecommunications firms can utilise these insights to optimise service delivery by prioritising infrastructure expansion in underconnected districts and aligning technical performance with game-related usage demands. Game developers and publishers are advised to innovate content strategies that leverage the capacities of 5G networks, particularly through cloud-based gameplay and real-time interaction features. For policymakers, the study underscores the importance of integrated governance models that support spectrum availability, promote equitable access to compatible devices, and address the digital skills gap among users. Without such interventions, the risk of deepening digital inequality remains significant, especially as 5G services become increasingly embedded in everyday digital economies.

Several limitations must be acknowledged. The research was geographically confined to a single city, which, while providing rich contextual insight, may not fully represent the diversity of 5G deployment experiences across Indonesia or Southeast Asia. The cross-sectional nature of the study captures a snapshot in time but does not account for the evolving nature of user adaptation, regulatory responses, or technological maturation. Additionally, the sample size of qualitative informants, although adequate for thematic saturation, limits generalisability to broader industry ecosystems.

Future research should consider longitudinal studies that track user behaviour and infrastructure developments as 5G networks scale up. Comparative studies across urban and rural regions could offer deeper understanding of spatial disparities in access and adoption. Furthermore, interdisciplinary investigations that incorporate environmental, regulatory, and behavioural economics perspectives may provide a more comprehensive view of how 5G intersects with broader sustainability and governance agendas. Exploration of adjacent technologies such as augmented reality, virtual economies, and artificial intelligence in the context of 5G gaming could also yield novel theoretical and managerial insights.

References

1. Lessi, C.C., Gavrielides, A., Solina, V., Qiu, R., Nicoletti, L., Li, D.: 5G and Beyond 5G Technologies Enabling Industry 5.0: Network Applications for Robotics. Procedia Computer Science, Elsevier B.V., 675–687 (2024).
2. Baena, C., Fortes, S., Penaherrera-Pulla, O.S., Baena, E., Barco, R.: Gaming in the Cloud: 5G as the Pillar for Future Gaming Approaches. IEEE Communications Magazine 62, 76–82 (2024). https://doi.org/10.1109/MCOM.005.2300256

3. Baek, S., Ahn, J., Kim, D.: Future Business Model for Mobile Cloud Gaming: The Case of South Korea and Implications. IEEE Communications Magazine 61 (2023). https://doi.org/10.1109/MCOM.001.2200374
4. Alsulami, M.H.: Challenges Facing the Implementation of 5G. Journal of Ambient Intelligence and Humanized Computing 14 (2023). https://doi.org/10.1007/s12652-021-03397-1
5. Suryanegara, M.: 5G as Disruptive Innovation: Standard and Regulatory Challenges at a Country Level. International Journal of Technology 7 (2016). https://doi.org/10.14716/ijtech.v7i4.3232
6. Forge, S., Vu, K.: Forming a 5G Strategy for Developing Countries: A Note for Policy Makers. Telecommunications Policy 44 (2020). https://doi.org/10.1016/j.telpol.2020.101975
7. Anh, P.Q.: Shifting the Focus to East and Southeast Asia: A Critical Review of Regional Game Research. Fudan Journal of the Humanities and Social Sciences 14 (2021). https://doi.org/10.1007/s40647-021-00317-7
8. Attaran, M.: The Impact of 5G on the Evolution of Intelligent Automation and Industry Digitization. Journal of Ambient Intelligence and Humanized Computing 14 (2023). https://doi.org/10.1007/s12652-020-02521-x
9. Bagaa, M., Taleb, T., Laghrissi, A., Ksentini, A., Flinck, H.: Coalitional Game for the Creation of Efficient Virtual Core Network Slices in 5G Mobile Systems. IEEE Journal on Selected Areas in Communications (2018).
10. MrsR, M., SMIB, J., H, M.: Re-shaping the Gaming Industry after 5G. International Journal of Research in Applied Science and Engineering Technology 10 (2022). https://doi.org/10.22214/ijraset.2022.42142
11. Wang, C., Zhou, T.: Multi-level Storage Based Auditing Scheme for 5G and Beyond Defined Edge Computing. Journal of Surveillance, Security and Safety (2022). https://doi.org/10.20517/jsss.2021.18
12. Bujang, M.A.: An Elaboration on Sample Size Determination for Correlations Based on Effect Sizes and Confidence Interval Width: A Guide for Researchers. Restorative Dentistry and Endodontics 49 (2024). https://doi.org/10.5395/rde.2024.49.e21
13. Banda, L., Mzyece, M., Mekuria, F.: 5G Business Models for Mobile Network Operators - A Survey. IEEE Access 10 (2022). https://doi.org/10.1109/ACCESS.2022.3205011
14. Kao, H.W., Wu, E.H.K.: QoE Sustainability on 5G and Beyond 5G Networks. IEEE Wireless Communications 30 (2023). https://doi.org/10.1109/MWC.007.2200260
15. Braun, V., Clarke, V.: Thematic Analysis: A Practical Guide. QMiP Bulletin 1 (2022). https://doi.org/10.53841/bpsqmip.2022.1.33.46
16. Newzoo: “Global Games Market Report 2024,” 2024. Available at: https://newzoo.com [Accessed: 07 Oct 2025].