การประยุกต์ใช้ปัญญาประดิษฐ์ในการจัดการอีสปอร์ต: โอกาสของไทย
Exploring AI Applications in Esports Management: Opportunities for Thailand

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บทคัดย่อ

อุตสาหกรรมอีสปอร์ตกำลังเติบโตอย่างก้าวกระโดด กลายเป็นปรากฏการณ์ระดับโลกที่มีความสำคัญทั้งในด้านเศรษฐกิจและวัฒนธรรม ในประเทศไทย ระบบนิเวศอีสปอร์ตขยายตัวอย่างรวดเร็วโดยได้รับแรงผลักดันจากการสนับสนุนของรัฐบาล การลงทุนเชิงกลยุทธ์ และความร่วมมือกับบริษัทยักษ์ใหญ่ต่าง ๆ ปัจจัยเหล่านี้ทำให้ประเทศไทยกลายเป็นผู้เล่นสำคัญในภูมิภาคเอเชียตะวันออกเฉียงใต้ สะท้อนถึงศักยภาพด้านนวัตกรรมและความสามารถในการแข่งขัน

ปัญญาประดิษฐ์ (AI) กำลังพลิกโฉมการจัดการอีสปอร์ต ด้วยการเพิ่มประสิทธิภาพการเล่นของผู้เล่น ปรับปรุงการดำเนินงานของการแข่งขัน และยกระดับประสบการณ์ของผู้ชม ในประเทศไทย การนำ AI มาใช้เริ่มมีบทบาทสำคัญในการวิเคราะห์ข้อมูลการเล่น พัฒนากลยุทธ์ และสร้างประสบการณ์ที่ดึงดูดผู้ชม อย่างไรก็ตาม การนำ AI มาประยุกต์กับการจัดการอีสปอร์ตยังมีความท้าทายที่สำคัญ เช่น ความกังวลด้านการคุ้มครองข้อมูลส่วนบุคคล ความเหลื่อมล้ำของโครงสร้างพื้นฐานดิจิทัล และช่องว่างด้านทักษะ ซึ่งต้องได้รับการแก้ไขเพื่อให้การผสานเทคโนโลยี AI เข้ากับระบบนิเวศอีสปอร์ตเป็นไปอย่างมีจริยธรรมและเท่าเทียม

บทความนี้วิเคราะห์การประยุกต์ใช้ AI ความท้าทาย และโอกาสในอนาคตสำหรับการจัดการอีสปอร์ต โดยเน้นบริบทเฉพาะของประเทศไทย พร้อมทั้งชี้ให้เห็นถึงความสำคัญของการสนับสนุนจากภาครัฐ การขยายหลักสูตรการศึกษา และการพัฒนาศูนย์นวัตกรรมอีสปอร์ต แม้การก้าวขึ้นเป็นผู้นำระดับโลกในด้านอีสปอร์ตที่ขับเคลื่อนด้วย AI จะยังเป็นเป้าหมายที่ท้าทาย แต่ความพยายามเหล่านี้สามารถช่วยเสริมความแข็งแกร่งให้กับสถานะของประเทศไทยในภูมิภาคและเวทีโลกได้อย่างมีนัยสำคัญ

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ABSTRACT

The esports industry has experienced exponential growth, evolving into a global phenomenon with substantial economic and cultural significance. In Thailand, the esports ecosystem has expanded rapidly, driven by government support, strategic investments, and partnerships with major corporations. These factors have positioned the country as a prominent player in Southeast Asia's esports landscape, demonstrating its capacity for innovation and competitive development.

Artificial intelligence (AI) is revolutionizing esports management by optimizing player performance, streamlining tournament operations, and enhancing audience engagement. In Thailand, AI adoption is gradually transforming how organizations analyze gameplay, develop strategies, and provide immersive experiences for fans. Nevertheless, the industry faces significant challenges, including data privacy concerns, digital infrastructure disparities, and skill gaps, which must be addressed to ensure the ethical and equitable integration of AI technologies.

This article examines the applications, challenges, and opportunities of AI in esports management, emphasizing Thailand's unique context. It highlights the importance of leveraging government initiatives, expanding educational programs, and developing esports innovation hubs to foster sustainable growth. While global leadership in AI-driven esports remains an ambitious goal, these efforts can significantly strengthen Thailand’s position in the regional and global esports ecosystem.

Keywords: Esports Management, Artificial Intelligence, Thailand Esports.

1.Introduction

The esports industry has experienced exponential growth over the past decade, evolving from a niche subculture into a global phenomenon. By 2023, the global esports market exceeded $1.88 billion in revenue, driven by a dedicated audience surpassing 500 million enthusiasts worldwide. This explosive growth has been fueled by technological advancements, expanding internet access, and the increasing recognition of esports as a legitimate professional industry. The industry is projected to maintain a compound annual growth rate (CAGR) of 26.8% through 2030, solidifying its position as a cornerstone of the global digital economy.

In Thailand, the esports landscape mirrors the global trajectory, bolstered by a vibrant gaming community and strategic investments from both public and private sectors. Government initiatives, such as the official recognition of esports as a professional sport under the Sports Authority of Thailand (Royal Thai Government Gazette, 2024), have played a crucial role in fostering the rapid development of infrastructure and talent. According to a report from Statista in March 2024, Thailand's esports market is projected to reach a revenue of US$22.1 million in 2024, with a compound annual growth rate (CAGR) of 7.52% from 2024 to 2028, culminating in a market volume of US$29.6 million by 2028. This growth is driven by an expanding user base, expected to reach 9.7 million users by 2028, and increasing user penetration from 11.1% in 2024 to 13.4% by 2028 (Statista, 2024).

Simultaneously, artificial intelligence (AI) has emerged as a transformative force across industries, including healthcare, finance (Davenport and Ronanki, 2018), and entertainment (Prasad and Makesh, 2023). In the esports industry, AI is reshaping how games are played, managed, and consumed. AI technologies are now integral to optimizing player performance, enhancing audience engagement, and streamlining tournament operations. By analyzing large datasets, predicting outcomes, and delivering personalized experiences, AI empowers esports stakeholders to remain competitive in an increasingly saturated market.

Thailand's esports ecosystem exemplifies the intersection of these dynamic trends. As a burgeoning hub for esports in Southeast Asia, the country benefits from strong government backing, a thriving gaming population, and innovative collaborations between academic institutions, private enterprises, and international organizations. Local initiatives, such as those led by Sportlyze, a Thai company specializing in AI solutions for esports, underscore Thailand’s potential as a leader in AI-driven esports management. These synergies have enhanced the competitiveness of Thai teams and tournaments while positioning the country as a regional model for AI adoption.

This article explores the transformative potential of AI in esports management, focusing on Thailand’s unique context. It examines the practical applications of AI in optimizing player performance, improving tournament operations, and engaging audiences, while addressing the challenges and ethical considerations associated with AI implementation. By exploring

examples of AI adoption globally and in Thailand, this discussion highlights opportunities for Thailand to leverage AI in esports management to modernize its approach and enhance its competitiveness.

2.Esports Management: An Overview

Scope of AI in Esports

Artificial Intelligence (AI) has emerged as a transformative force in esports management, reshaping gameplay analysis, tournament operations, and audience engagement. AI technologies, leveraging machine learning algorithms and big data analytics, provide esports organizations with tools to enhance various aspects of competitive gaming. For example, Smerdov et al. (2022) demonstrated the application of deep learning techniques, such as recurrent neural networks (RNNs), to predict player performance in real-time. Their "Time to Die" model incorporates dynamic features like hero states and proximity data, aiding players, coaches, and broadcasters in making strategic decisions during matches. Similarly, Ringer et al. (2023) expanded on these models by including additional features, such as status effects and temporal gameplay data, which enhanced coaching strategies and provided broadcasters with real-time alerts for better event preparation.

AI's impact extends to tournament operations, where it optimizes scheduling, matchmaking, and participant experiences. By analyzing large datasets, AI-driven systems streamline logistics and ensure fairness in competitive environments (Keiper et al., 2023). Additionally, AI significantly enhances audience engagement. Wang (2023) emphasized the role of AI win prediction models in live streaming, which offer tailored insights and real-time analytics to improve fan interaction. Features like interactive dashboards and personalized commentary create immersive experiences that deepen connections between fans and events. These advancements, as highlighted by Jordan-Vallverdú et al. (2024), address emerging needs such as fan engagement and management strategies, underscoring AI's role in modernizing esports management and its ability to adapt to a rapidly evolving industry.

3.Applications of AI in Esports Management

Player Performance Analysis

AI technologies have revolutionized player performance analysis, offering teams and players unprecedented tools for refining strategies and optimizing gameplay. By leveraging machine learning algorithms, AI can process vast amounts of gameplay data, such as match statistics, player movements, and in-game decisions, to provide actionable insights. These insights help teams identify strengths, weaknesses, and areas for improvement, enabling tailored strategies and skill development (Ghatak, 2023; Smerdov et al., 2022).

AI-powered coaching tools have become indispensable for esports organizations, offering personalized recommendations based on individual and team performance. These

tools provide real-time feedback during practice sessions, helping players refine their skills and make better decisions in high-pressure scenarios. AI-driven systems also enhance decision-making processes by predicting player performance based on historical data and contextual factors, allowing teams to optimize their strategies and roster configurations (Ghatak, 2023).

Recent research highlights the role of AI in analyzing physiological and environmental data, which can further refine player performance predictions and tactical planning (Smerdov et al., 2022). Incorporating such technologies into Thai esports management presents a significant opportunity for local teams to gain a competitive edge. By adopting AI-powered gameplay analysis and predictive tools, Thailand's esports organizations can build a strong foundation for sustained success in both regional and global tournaments.

In Thailand, the AI start-up Sportlyze exemplifies this potential, offering a range of services tailored to esports teams. These include AI-driven performance analysis to evaluate player behavior and gameplay, strategy development through predictive analytics, and real-time data analytics to enhance decision-making during competitions. By applying these services, Sportlyze empowers teams to refine their tactics, optimize player training, and gain a competitive edge in tournaments (Kittitachs, 2023).

Game Strategy and Win Prediction

AI has become increasingly critical in enhancing game strategy and win prediction within esports management. Procedural content generation, as highlighted by Durwin (2023), allows AI systems to simulate countless game scenarios, providing teams with dynamic practice environments tailored to their needs. These simulations help players anticipate various in-game situations, refine their responses, and adapt strategies in real-time.

Furthermore, AI algorithms analyze gameplay patterns and predict match outcomes based on player performance, team dynamics, and historical data. These predictive tools are invaluable for refining team strategies, optimizing player roles, and preparing for high-stakes competitions (Ghatak, 2023). By offering insights into opponent tendencies and optimal tactics, AI ensures teams are better equipped to handle the complexities of competitive gaming.

Durwin’s (2023) and Ghatak’s (2023) insights underscore the transformative potential of AI in both strategic planning and gameplay analysis. These innovations elevate the level of competition, making AI an indispensable tool in esports management. By incorporating these technologies, Thailand's esports teams and organizations can position themselves as leaders in the rapidly evolving global esports landscape.

Audience Engagement

AI-driven tools have significantly transformed audience engagement in esports, enhancing how fans interact with tournaments and broadcasts. Real-time analytics provide dynamic insights, including player statistics and predictive analytics, allowing audiences to

follow the game more closely and understand performance trends. AI-powered commentary and interactive dashboards further enrich the viewing experience, offering context-aware insights that improve storytelling and immersion (Manoharan, 2024; Acree, 2024).

Moreover, AI systems personalize content delivery by tailoring highlights, analyses, and recommendations based on viewers' preferences and past behavior. These technologies help esports organizations ensure relevant and engaging content, which fosters greater loyalty and retention among audiences. AI-powered social media automation, including chatbots and sentiment analysis tools, further supports dynamic audience interactions, enhancing satisfaction and boosting brand visibility (Manoharan, 2024; Forbes, 2023).

By leveraging these technologies, esports organizations can build stronger connections with their fanbase and ensure a compelling and interactive spectator experience, aligning with broader global trends in AI-enhanced entertainment (Esports Insider, 2023).

4.Challenges in the Thai Context

Data Privacy and Security

The reliance on AI systems for data collection poses challenges in compliance with Thailand's Personal Data Protection Act (PDPA). Esports organizations must anonymize and secure sensitive data, such as player metrics and audience interactions, to maintain trust among stakeholders. This is especially critical when handling data from players who are minors, as parental consent is required for data collection and use, consistent with PDPA guidelines emphasizing informed and explicit consent (Mana and Butr-Indr, 2022). Additionally, when data is transferred to organizers in other countries, those countries must have data protection laws that meet or exceed the standards of Thailand's PDPA. Failure to comply with these regulations risks not only legal repercussions but also reputational harm, emphasizing the need for meticulous legal review and robust data protection measures in esports competitions (PDPA Thailand, 2022).

Infrastructure Limitations

Thailand's digital infrastructure exhibits significant disparities between urban and rural areas. Urban centers like Bangkok enjoy advanced facilities and widespread internet access, while rural regions often lack the resources needed to adopt AI technologies effectively. This digital divide impacts various sectors, including esports, where smaller organizations in rural areas struggle to implement AI-driven tools. These limitations exacerbate competitive inequalities, as urban-based organizations can more readily leverage advanced technologies for strategic and operational advantages (Apriliyanti et al., 2021; Lopez-Sintas et al., 2020).

Skill Gaps

A shortage of AI-trained professionals in Thailand presents a significant barrier to the adoption of AI technologies across industries, including esports. This skills gap reflects systemic challenges in the country's education system, which struggles to align workforce training with the demands of a digital economy (Wongwatkit et al., 2023; Intaratat, 2021; Vandeweyer et al., 2020). Addressing this issue requires comprehensive educational reforms emphasizing digital literacy and advanced technological skills. Expanding initiatives that integrate AI-focused curricula can better prepare professionals to manage and innovate in AI-driven ecosystems, ensuring competitiveness and sustainable growth in the esports sector and beyond.

5.Ethical Considerations in AI Implementation

The adoption of AI in esports requires careful attention to ethical considerations to ensure transparency, fairness, and accountability.

Transparency and Fairness: AI systems used in matchmaking and win prediction must operate transparently to uphold tournament integrity. Algorithmic accountability and regular audits are crucial for mitigating perceived biases and ensuring fairness. These measures build trust among players and fans while reinforcing the competitive integrity of esports events (Xu, 2023; Taylor Wessing, 2023).

Privacy Risks: AI systems that collect player and audience data must implement robust safeguards to prevent misuse. Ensuring compliance with data protection laws, such as Thailand's PDPA or the European Union's GDPR, is essential to maintaining user trust and avoiding legal penalties. Employing data minimization techniques and encryption technologies can effectively secure sensitive information, reducing the risk of data breaches (Taylor Wessing, 2023).

6.Future Directions in Thailand

Government Support

The Digital Economy Promotion Agency (DEPA) plays a pivotal role in fostering AI advancements within Thailand's esports sector. By funding research, infrastructure, and startup initiatives, DEPA supports innovation and promotes equitable access to AI technologies. For instance, DEPA's "depa ESPORTS" project focuses on enhancing the esports industry by aiding game developers, tournament organizers, and players, thereby driving growth and competitiveness (DEPA, 2023).

Educational Integration

Addressing skill shortages in AI and esports management is vital for sustained industry growth. Expanding academic programs to include specialized AI certifications equips professionals with essential skills for navigating an AI-driven landscape. Soodmee and

Jaroenwiriyakul (2021) emphasize the need for tailored curriculum development to meet the specific demands of esports, highlighting its role in building a sustainable and competitive industry in Thailand.

Esports Innovation Hubs

Developing esports innovation hubs is essential for fostering collaboration among academics, industry leaders, and developers. DEPA's "depa ESPORTS" project underscores the importance of creating infrastructure that supports esports technologies and practices. Such hubs can position Thailand as a leader in AI-driven esports, enhancing its competitive edge on the global stage (DEPA, 2023).

By emphasizing these strategic areas, Thailand can strengthen its position in the esports industry. While leveraging AI for innovation and growth offers immense potential, achieving global leadership will require consistent investment and collaboration across sectors.

7.Conclusion

Thailand stands at a transformative juncture in advancing AI-driven esports management, with unique opportunities to become a leader in the regional esports ecosystem. The adoption of AI technologies has demonstrated significant potential in enhancing player performance, optimizing tournament operations, and engaging audiences. Examples such as AI-driven coaching tools, predictive analytics for gameplay, and immersive spectator experiences underscore the transformative power of AI in modernizing esports. However, achieving sustained progress requires addressing critical challenges, including data privacy concerns, digital infrastructure disparities, and a significant skills gap in AI proficiency.

Government initiatives like the "depa ESPORTS" project and the "Esports in School" program by the Digital Economy Promotion Agency (DEPA) are pivotal in fostering a supportive environment for AI integration in esports. These projects aim to build a comprehensive esports ecosystem by promoting digital literacy and providing platforms for talent development.

To further advance, Thailand should focus on expanding educational initiatives that integrate AI-focused curricula, thereby preparing professionals to manage and innovate within AI-driven ecosystems. Developing innovation hubs will also facilitate collaboration among stakeholders, driving technological advancements in the esports sector.

By aligning these efforts with ethical considerations and fostering strategic collaborations across sectors, Thailand can strengthen its position in the regional esports ecosystem. While global leadership remains an ambitious goal, these foundational steps can drive progress, ensuring the country's competitiveness and long-term success in the rapidly evolving esports industry.

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