



THE DIGITAL TRANSFORMATION OF TENNIS: A HOLISTIC ANALYSIS FROM ATHLETE TRAINING TO THE FAN EXPERIENCE

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Abstract:

This research examines the multifaceted digital transformation of tennis, analyzing the impact of new technologies on four key pillars: athlete training and performance, officiating and "smart" courts, fan experience and engagement, and emerging business models and governance. The integration of Artificial Intelligence, the Internet of Things through wearable sensors and "smart" equipment, and blockchain technology is radically reshaping how the sport is trained, played, watched, and managed. Technologies such as motion analysis systems, "smart" racquets, electronic officiating systems, personalized content platforms for fans, and Non-Fungible Tokens are analyzed. The research demonstrates that while these technologies offer unprecedented opportunities for performance optimization, objectivity in officiating, and deeper fan connection, they also present challenges related to adoption, regulation, commercial viability, and the need for unified governance. The research concludes that successfully navigating this new landscape requires a strategic approach that balances innovation with tradition, ensuring that technology acts as an enhancing factor for the sport rather than an end in itself.

Keywords: digital transformation, tennis, Artificial Intelligence, performance analysis, sports technology

1. Introduction

Tennis, a sport with deep historical roots and global appeal, is at the epicenter of a radical digital transformation. The convergence of advanced technologies such as Artificial Intelligence, the Internet of Things, big data analytics, and blockchain is not merely changing individual aspects of the sport but is reshaping its entire ecosystem (Pilaniwala,

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2023; Мирошниченко & Birch, 2024; Keegan et al., 2024; Bilohur et al., 2023; Heng & Zhang, 2025). From personalized training methods based on biometric data to the replacement of line judges with automated systems and the creation of new, immersive experiences for fans, technology is redefining the rules of the game, both on and off the court (Pilaniwala, 2023; Solntsev et al., 2022; Aliyev et al., 2023).

The global sports technology market for tennis was valued at \$2,025.3 million in 2024, with projections for an increase to \$6,401.9 million by 2030, recording an impressive compound annual growth rate (CAGR) of 21.8% (Apostu et al., 2022; Ippolito, 2022). This economic momentum reflects the rapid adoption of innovations aimed at optimizing every facet of the sport (Apostu et al., 2022; Madancian & Hamed, 2024). This transformation is not just a technological upgrade but a strategic imperative for federations, clubs, athletes, and organizers seeking to remain competitive and relevant in a constantly evolving landscape (Zarifis & Cheng, 2022; Hoang, 2024).

The purpose of this paper is to map and analyze the key dimensions of this digital transformation. The analysis is structured into four thematic sections. The first section focuses on the revolution brought about by technology in athlete training and performance, examining "smart" equipment, wearable sensors, and data analysis platforms (Periyasami & Periyasamy, 2022; Baker et al., 2022).

The second section explores the rise of "smart" courts and the automation of officiating (Masekar & Patel, 2023; Multazam, 2022).

The third section analyzes how technology is transforming fan experience, making it more interactive, personalized, and immersive (Principe et al., 2025; Razi et al., 2024).

Finally, the fourth section examines the new business models and governance challenges that are emerging, with an emphasis on blockchain and NFT technologies (Fu, 2024; Kuai et al., 2023). Through this holistic approach, the article aims to offer a comprehensive picture of the "*tennis of tomorrow*" (Ashutosh & Gupta, 2024).

The interconnection of these four pillars, which form the core of our analysis, is schematically illustrated below in Figure 1.

2. The Revolution in Athlete Training and Performance

Traditional coaching, based on experience and observation, is gradually giving way to a scientific and data-centric approach. Artificial Intelligence and the IoT are the cornerstones of this revolution, enabling the absolute personalization of the training process and performance analysis at a previously unimaginable level.

2.1 Smart Equipment: The Racquet as a Data Hub

The history of "smart" equipment in tennis effectively began in 2012 when Babolat introduced the Play&Connect racquet, the first to incorporate IoT technology. The main challenge for engineers was to create a racquet that felt exactly the same as a conventional one to be accepted by professionals. The solution was found in integrating a tiny 6-axis motion tracking unit (combining a gyroscope and an accelerometer) weighing just one

gram into the racquet's handle. These sensors accurately record critical parameters such as:

- **Shot Power and Ball Speed:** the accelerometer measures the racquet's acceleration at the moment of contact, allowing for the calculation of ball speed.
- **Ball Spin:** the gyroscope determines the racquet's orientation, which, combined with its speed, calculates the amount of spin.
- **Impact Point:** through algorithms that combine data from both sensors, the racquet can calculate how close to the center of the strings ("sweet spot") the shot was made. This is vital, as an off-center hit causes greater vibrations and can affect the ball's trajectory.

This data is transmitted wirelessly via Bluetooth to a smartphone application, where the player and coach can view detailed statistics for each shot (forehand, backhand, serve), comparing their performance with previous training sessions. Today, other major companies like Head, Wilson, and Yonex have followed suit, making "smart" racquets an increasingly widespread tool.

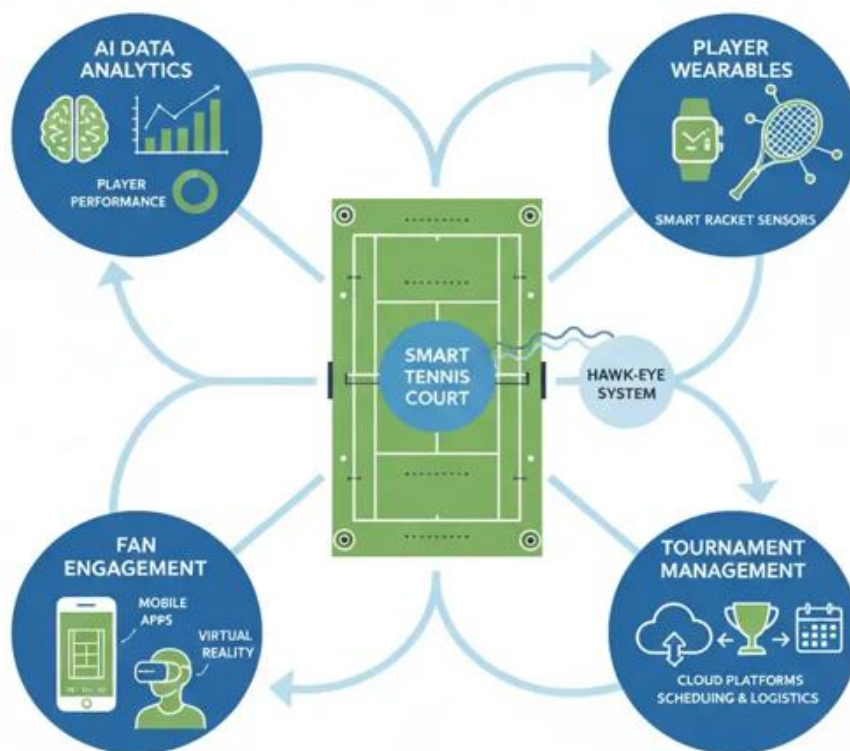


Figure 1: The four pillars of digital transformation in tennis

2.2 Wearable Sensors: Decoding Athlete Physiology

Beyond the racquet, wearable sensors worn on the body have become an integral part of the preparation of top athletes. These devices, from "smart" watches and chest straps to sensors embedded in clothing (Athos Wearable Fitness Technology), record a plethora of biometric and kinetic data (Tennis Nerd, 2024).

The primary data collected include:

- **Heart Rate and Heart Rate Variability (HRV):** monitoring heart rate zones helps coaches quantify the training load. HRV, the variation in time between heartbeats, is used as an indicator of the nervous system's readiness and recovery. A low HRV can signal fatigue or overtraining (Tennis Nerd, 2024).
- **Motion Analysis:** IMU (inertial measurement units) sensors record acceleration, deceleration, explosive movements, and changes of direction, providing data on movement efficiency on the court and identifying fatigue in footwork (Tennis Nerd, 2024).
- **Injury Prevention:** The analysis of biomechanical movement patterns and hitting load is crucial. AI-based systems can identify injury risk with an accuracy of up to 81%, warning of dangerous movements or the risk of overuse injuries.

However, the use of these devices during official matches remains a controversial issue. At the 2026 Australian Open, top athletes such as Carlos Alcaraz, Jannik Sinner, and Aryna Sabalenka were asked to remove their devices (Whoop), despite them being permitted in other ATP and WTA tournaments. This incident highlighted the fragmented governance in the sport, with the Grand Slams maintaining different rules from the federations (Sports Business Journal, 2026). Players argue that this data is critical for post-match analysis and recovery, not for providing real-time tactical instructions (Sinner, as cited in ESPN, 2026).

2.3 Video Analysis and AI Platforms

Video analysis, enhanced by AI, has transformed technical and tactical preparation. Technologies like computer vision and deep learning allow for the automatic analysis of vast amounts of video from matches and training sessions. Platforms such as Tennis AI, SportAI, and SwingVision use the camera of a simple smartphone to provide immediate feedback. The algorithm analyzes the player's and racquet's movement, comparing it to models of top professionals, and provides precise measurements for racquet speed, swing trajectory, body movement, and more. These applications "democratize" access to high-level analysis, which was previously available only in elite academies (Pedersen, as cited in Forbes, 2025).

Furthermore, AI is used for:

- **Personalized Workouts:** programs adapt dynamically (adaptive training) based on the player's progress, fatigue, and physiological profile.
- **Tactical Analysis:** opponent's tactical patterns are identified, such as preferred serve directions or reactions under pressure (PMC, 2024).
- **Personalized Equipment Recommendations:** by analyzing indicators like attack angle and swing speed, AI can suggest racquets, strings, and even string tension that best suit a player's game, replacing subjective "feel" with objective data.

The synergy of these technologies creates a holistic data ecosystem around the athlete. AI is not here to replace the coach, but to enhance their judgment, making the

coaching process more scientific and effective. The overall workflow, from the collection of primary data to the generation of actionable insights, is presented below in Figure 2.

AI DATA PROCESSING FLOW IN PROFESSIONAL TENNIS



Figure 2: The data ecosystem in modern tennis training

3. Smart Courts and Automated Officiating

The digital transformation also extends to the playing field itself, turning traditional courts into "Smart Courts" that record, analyze, and transmit every aspect of the game in real time. The typical architecture of such a system, as shown in Figure 3, is based on a central AI server that processes data from multiple sources. This evolution has culminated in the automation of officiating, one of the most visible and controversial changes in modern tennis.

3.1 Hawk-Eye: From Broadcast Replay to Full Automation

The Hawk-Eye system, originally developed in 1999, is based on the principles of triangulation, using a network of 10 synchronized high-speed cameras positioned around the court (Sports Technology Blog, 2020). The system processes data from the cameras to identify the image of the ball in each frame, calculate its three-dimensional position, and reconstruct its trajectory. The system's accuracy is reported to have an average error of 3.6 millimeters, which is impressively small compared to the 67-millimeter diameter of a tennis ball (Tennis Nerd, 2022).

Its use began as a television analysis tool and was later integrated into the game through the challenge system, which for the first time gave players the ability to dispute the decisions of line judges (Hopman Cup 2006, US Open 2006). However, the most radical development is "Hawk-Eye Live," a system that eliminates the need for line judges. The system makes "in" or "out" calls in real time, announcing "out" decisions through speakers with a recorded human voice.

The 2021 Australian Open was the first Grand Slam to adopt Hawk-Eye Live for all matches, a decision accelerated by the need to reduce staff due to the COVID-19 pandemic. The US Open followed, and from 2025, even the traditional Wimbledon will completely replace line judges with technology. The only exception remains Roland-Garros (French Open), where the clay surface leaves a clear mark from the ball, which is

considered sufficient evidence and is examined by the chair umpire (Wikipedia, n.d.-a; IoT For All, n.d.).

3.2 PlaySight and Other Smart Court Platforms

Beyond officiating, systems like PlaySight, CourtSense, and FlightScope are turning courts into interactive training and analysis centers. These platforms, also based on cameras and AI algorithms, offer a range of services for both professional and amateur players (Sports Technology Blog, 2020; Neural Coders, 2025).

The capabilities of smart courts include:

- **Automated Recording and Analysis:** the system records the entire training session or match and automatically provides statistics for each shot (speed, spin, placement), player movement (distance covered, heat maps), and score progression.
- **Multiple Viewing Angles and Instant Replay:** players and coaches can review any point from different angles via a kiosk on the court or an app, immediately after it happens.
- **Automatic Highlight Creation:** AI algorithms identify the most important moments (e.g., winners, long rallies) and automatically create highlight videos, which can be shared on social media.
- **Live Streaming:** many platforms offer automated production and live broadcasting of matches, making it possible to cover matches at the club or collegiate level without the need for a television crew.

For clubs and academies, installing such systems is a strategic investment. It increases member engagement, attracts younger, tech-savvy players, and creates new revenue streams, such as selling "*performance analysis packages*". One example is a resort that, after installing smart courts, saw member engagement increase by 30% within six months (Neural Coders, 2025).

4. The Transformation of the Fan Experience

The digital revolution is not limited to athletes and courts but is also radically transforming the way fans experience tennis. The traditional, passive viewing of a match is being converted into a dynamic, personalized, and immersive experience, where the fan has unprecedented control and access to information.

4.1 Personalized Broadcasts and the Second Screen

Artificial Intelligence is the catalyst for this transformation, allowing broadcasters to offer content tailored to each viewer's preferences. Platforms like Magnifi use algorithms to automatically identify and extract key moments from live matches, creating real-time highlights. This allows fans to customize their viewing experience: a fan might choose to see only their favorite player's backhand winners or all the break points of a specific set. The rise of "second screen viewing" is a dominant phenomenon, with fans using

smartphones and tablets simultaneously while watching the match on television. Research by Infosys showed that 83% of fans enjoy the game more thanks to data-driven analysis (PR Newswire, 2020). Digital platforms, such as the Infosys Match Centre at the Australian Open, offer real-time statistics, predictions, and AI-based commentary, enriching the understanding of the match for both casual viewers and avid fans (LinkedIn, 2024).

Other innovations in television coverage include:

- **Smart Camera Angles:** AI-controlled cameras automatically track the ball and players, offering more dynamic and focused shots without the need for a large television crew (LinkedIn, 2024).
- **Automated Commentary and Translations:** Generative AI (GenAI) enables the creation of automated commentary, especially for lower-level matches without television coverage, as well as automatic translation and subtitling, making the sport more accessible globally.
- **Better Social Media Interaction:** the automatic creation of short clips and summaries, optimized for platforms like Instagram and X, keeps fans engaged even if they are not watching the entire match. This strategy contributed to a 25% increase in the WTA's social media followers in 2024 (Magnifi, 2024).

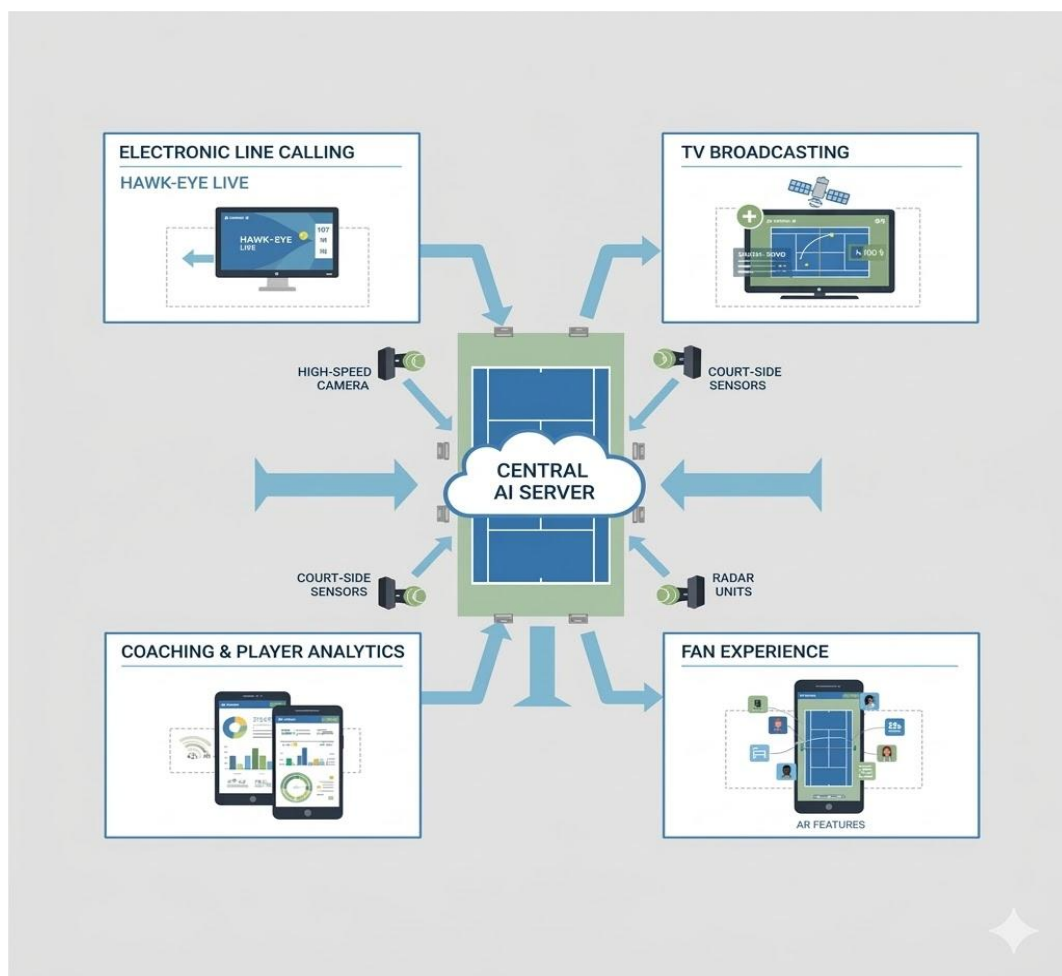


Figure 3: Architecture of a Smart Tennis Court

4.2 Immersive Experiences: VR, AR, and the Metaverse

Technology is pushing fan experience beyond the two dimensions of the screen. Virtual Reality (VR) and Augmented Reality (AR) offer new ways to "immerse" oneself in the action.

- **Virtual Reality (VR):** Fans can wear a VR headset and experience a match as if they were in a courtside seat or even from the player's point of view (Sportspro, 2024). Virtual stadiums (VR AI stadiums) are also being created where fans can design their own courts or watch matches from unique perspectives (LinkedIn, 2024).
- **Augmented Reality (AR):** AR applications can display real-time statistics, player information, and interactive games over the live broadcast image, bringing fans closer to the action (LinkedIn, 2024). In the stadium, these apps can offer wayfinding or display activations on the court (Sportspro, 2024).
- **Metaverse and Gamification:** the Australian Open pioneered by creating a digital representation of Melbourne Park in Decentraland, a virtual reality platform, allowing fans from all over the world to "visit" the facilities, watch historical content, and interact (Ausopen.com, 2022). Simultaneously, the adoption of experiences on platforms like Roblox and Minecraft aims to attract a new, younger generation of fans (The Guardian, 2025).

This convergence of the physical and digital worlds creates a unified, seamless experience for the fan, from ticket purchase and live betting to watching the match and interacting on social media, all within an integrated digital ecosystem (Sportspro, 2024).

5. New Business Models and Governance Challenges

The digital transformation affects not only the game but also the economy and governance structure of tennis. Blockchain technology introduces new paradigms for value creation, rights management, and stakeholder participation, although its adoption is accompanied by significant challenges.

5.1 Blockchain, NFTs, and the Fan Economy

Non-Fungible Tokens (NFTs) are unique digital assets recorded on a blockchain, a decentralized and immutable database (Blockchain Council, n.d.). In sports, NFTs have emerged as a tool for creating new revenue streams and strengthening the relationship with fans. The main applications include (Deloitte, 2022):

- **Digital Collectibles:** the most common use is the sale of limited-edition video clips of historic match moments or digital player cards. Their value is determined by rarity, the significance of the moment, and the athlete's popularity.
- **Fan Tokens:** digital tokens that provide their holders with voting rights on certain decisions (e.g., the song to be played in the stadium) or access to exclusive content and experiences.

- **Ticketing:** the use of NFTs as tickets can combat fraud and illegal resale, as each ticket is unique, traceable, and its ownership is verified on the blockchain (PMC, 2024).

The 2022 Australian Open was ambitious case study with its "AO Artball" program. It created 6,776 NFTs; each linked to a small plot of the Rod Laver Arena court. If the winning match point ball in any of the 600+ tournament matches landed on a plot corresponding to an NFT, its owner won the physical ball and a digital clip of the moment (Ausopen.com, 2022). Despite initial success, the value of the Artballs collapsed along with the broader cryptocurrency market, falling from about \$278 in 2022 to just \$25 in 2025. The program appears to have been abandoned, with its Discord server closed and no mention of it in recent tournaments (The Guardian, 2025; SportsIn.biz, n.d.). This case highlights the high volatility and risk associated with NFT investments, as well as the challenge of maintaining long-term value and engagement.

5.2 Governance Challenges in a Fragmented Landscape

The rapid introduction of technologies highlights the existing weaknesses and fragmentation in the governance of global tennis. As demonstrated by the controversy over wearables at the 2026 Australian Open, the four Grand Slam tournaments, the International Tennis Federation (ITF), and the men's (ATP) and women's (WTA) professional associations often operate with different rules and strategies (Sports Business Journal, 2026). This lack of coordination creates confusion for players, sponsors, and fans and can hinder the smooth adoption of new technologies.

Blockchain technology proposes a radically different governance model through Decentralized Autonomous Organizations (DAOs). A DAO is an organization that operates based on rules encoded in smart contracts on the blockchain, with decisions made collectively by its members, usually through token-based voting (PMC, 2024). Theoretically, a DAO could manage a tennis tournament, allowing stakeholders (athletes, fans, sponsors) to participate directly in decision-making on issues such as prize money distribution, rule changes, or the selection of venues (PMC, 2024).

However, the implementation of such models in sports faces significant obstacles: legal and regulatory complexities, the need for a high level of technological literacy among participants, and resistance from existing hierarchical power structures (PMC, 2024). The transition from traditional, centralized governance to a decentralized model requires a fundamental mindset shift that sports, for now, do not seem ready to fully embrace.

6. Conclusions

The digital transformation of tennis is a dynamic and irreversible phenomenon that is redefining sports at every level. The analysis has shown that technology acts as a powerful catalyst, unlocking new levels of performance, objectivity, and interaction. In the field of training, the convergence of AI with the IoT allows for unprecedented

personalization, transforming preparation from an art into a precision science and offering valuable tools for injury prevention and maximizing athletic longevity.

On the court, the automation of officiating through systems like Hawk-Eye Live, although initially controversial, appears to be establishing itself as the new standard, promising the elimination of human error and an increase in fairness. At the same time, "smart" courts are democratizing access to advanced analysis, benefiting not only the elite but also clubs and amateur players.

For fans, the experience is becoming richer, more interactive, and deeply personal. Personalized broadcasts, immersive VR/AR technologies, and new digital platforms enhance engagement and attract a new, younger audience. However, the introduction of new business models, such as NFTs, has proven to be volatile, as shown by the "AO Artball" case, highlighting the need for sustainable strategies that offer real and lasting value.

The biggest challenge, however, remains governance. The fragmentation of tennis's governing bodies hinders the coherent and uniform adoption of technology, creating a confusing regulatory landscape. While radical ideas like DAOs offer a vision for a more democratic and transparent future, their implementation remains distant. In conclusion, the successful integration of technology in tennis is not just a matter of adopting the latest innovation. It requires a holistic strategy that will harmonize technological progress with the fundamental values of the sport, respect its heritage, and ensure that technology remains a tool for enhancing the human element—the athlete, the coach, and the fan—and not for replacing it. The collaboration between physical training and new technologies is the key to the transition to the tennis of tomorrow.

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References

- Aliyev H, Aysan A, Kayani U, 2023. Future readiness with non-fungible tokens (NFTs): Prospects and challenges. <https://doi.org/10.20944/preprints202302.0424.v1>
- Apostu S, Panait M, Vasa L, Mihăescu C, Dobrowolski Z, 2022. NFTs and cryptocurrencies—The metamorphosis of the economy under the sign of blockchain: A time series approach. *Mathematics* 10(17): 3218. <https://doi.org/10.3390/math10173218>
- Baker B, Pizzo A, Su Y, 2022. Non-fungible tokens. *Sports Innovation Journal* 3: 1-15. <https://doi.org/10.18060/25636>
- Bilohur V, Syvohop E, Karabanov Y, 2023. A new paradigm for the development of the sports industry in digitalization conditions (based on the experience of highly developed countries in the world). *Humanities Studies* 93(16): 84-94. Retrieved from <https://doi.org/10.32782/hst-2023-16-93-09>
- Dolianiti M, 2022. Digital transformation in sports: The case of sports facilities and sports organizations (with case studies). Thesis, University of Piraeus.
- ESPN, 2026. Carlos Alcaraz, Jannik Sinner, Aryna Sabalenka asked to remove wearable fitness trackers at Australian Open. ESPN.
- Forbes, 2025. AI sports market changing tennis tech at grassroots and elite level. Forbes. Retrieved from <https://www.forbes.com/sites/timellis/2025/09/30/ai-sports-market-changing-tennis-tech-at-grassroots-and-elite-level/>
- Fu J, 2024. Gamified NFT loot box: Smart contract studies and prototype.
- Grand View Research, 2024. Tennis - sports technology market highlights. Grand View Research. Retrieved from <https://www.grandviewresearch.com/horizon/statistics/sports-technology-market/sports/tennis/global>
- Gupta M, 2024. Investigating the narrative of Trinity: 9NFTMANIA, Premium Domain, COREDAOVIP. *SJMBT* 2(2): 124-137. Retrieved from <https://doi.org/10.36676/sjmbt.v2.i2.42>
- Heng W, Zhang Y, 2025. Research on the digital transaction model of the sports industry chain based on blockchain technology. *Scientific Reports* 15(1). Retrieved from <https://www.nature.com/articles/s41598-025-10045-7>
- Hoang R, 2024. How technology changes monetization of musical digital assets. *The Boller Review* 7. <https://doi.org/10.18776/tcu/br/7/175>
- Ippolito J, 2022. Crypto-preservation and the ghost of Andy Warhol. *Arts* 11(2): 47. <https://doi.org/10.3390/arts11020047>

- Keegan B, McCarthy I, Kietzmann J, Canhoto A, 2024. On your marks, headset, go! Understanding the building blocks of metaverse realms. SSRN Electronic Journal. Retrieved from <https://doi.org/10.1016/j.bushor.2023.09.002>
- Kuai L, Lacity M, Mullins J, 2023. Web 2 vs. Web 3 paths to the metaverse: Who is leading? Who should lead? The Journal of British Blockchain Association 6(2): 1-9. Retrieved from <https://jbba.scholasticahq.com/article/87838-web-2-vs-web-3-paths-to-the-metaverse-who-is-leading-who-should-lead/attachment/180242.pdf>
- Madancian M, Hamed T, 2024. Business model evolution in the age of NFTs and the metaverse. Information 15(7): 378. <https://doi.org/10.3390/info15070378>
- Magnifi, 2024. How AI is transforming tennis broadcasting and fan engagement. Magnifi. Retrieved from <https://magnifi.ai/insights/how-ai-is-transforming-tennis-broadcasting-and-fan-engagement>
- Masekar H, Patel S, 2023. Overview of challenges of NFT marketplaces and introduction to Elixer. International Journal for Research in Applied Science and Engineering Technology 11(2): 398-411. <https://doi.org/10.22214/ijraset.2023.49046>
- Multazam M, 2022. Exploring the legal and policy implications of non-fungible tokens. Jurnal Politik Dan Pemerintahan Daerah 4(2): 293-303. <https://doi.org/10.36355/jppd.v4i2.58>
- Neural Coders, 2025. Smart courts, smarter matches: How AI is transforming the tennis experience. Neural Coders. Retrieved from <https://www.neuralcoders.com/2025/data-science/smart-courts-smarter-matches-how-ai-is-transforming-the-tennis-experience/>
- Periyasami S, Periyasamy A, 2022. Metaverse as future promising platform business model: Case study on fashion value chain. Businesses 2(4): 527-545. <https://doi.org/10.3390/businesses2040033>
- Pilaniwala P, 2023. How NFT is changing videogames and sports industry: A review. International Journal for Research in Applied Science and Engineering Technology 11(3): 404-415. <https://doi.org/10.22214/ijraset.2023.49426>
- PMC, 2024. Blockchain in sports events management: A theoretical framework for DAO implementation. PMC, NCBI.
- PR Newswire, 2020. Digital technology is driving tennis' experience beyond the 'golden era'. PR Newswire.
- Principe V, Ribeiro T, López-Carril S, 2025. Transformative blockchain technological approaches to sports events. Frontiers in Sports and Active Living 7. <https://doi.org/10.3389/fspor.2025.1547137>
- Razi Q, Devrani A, Abhyankar H, Chalapathi G, Hassija V, Guizani M, 2024. Non-fungible tokens (NFTs)—Survey of current applications, evolution, and future directions. IEEE Open Journal of the Communications Society 5: 2765-2791. <https://doi.org/10.1109/OJCOMS.2023.3343926>
- Sibanda K, Ndayizigamiye P, Twinomurizi H, 2024. Non-fungible tokens (NFTs) in healthcare: A thematic analysis and research agenda. Frontiers in Digital Health 6. <https://doi.org/10.3389/fdgth.2024.1377531>

- Solntsev I, Алексеева А, Сузов Я, 2022. New financial tools in sport: NFTs and fan tokens. *Journal of Corporate Finance Research* 16(2): 107-119. <https://doi.org/10.17323/j.jcfr.2073-0438.16.2.2022.107-119>
- Sports Business Journal, 2026. Australian Open not allowing wearable technology for players. *Sports Business Journal*. Retrieved from <https://www.sportsbusinessjournal.com/Articles/2026/01/27/australian-open-not-allowing-wearable-technology-for-players/>
- Sports Technology Blog, 2020. An overview of smart tennis courts 2020. *Sports Technology Blog*.
- Tennis.com, 2024. Game changer: SportAI uses cutting-edge artificial intelligence to improve performance. *Tennis.com*. Retrieved from <https://www.tennis.com/baseline/articles/game-changer-sportai-uses-cutting-edge-artificial-intelligence-to-improve-performance>
- The Guardian, 2025. Almost 10,000 images of tennis balls plunge up to 90% in value as Australian Open appears to ditch NFTs. *The Guardian*. Retrieved from <https://www.theguardian.com/sport/2025/jan/14/almost-10000-images-of-tennis-balls-plunge-up-to-90-in-value-as-australian-open-appears-to-ditch-nfts>
- Wendy M, 2022. Health datasets as assets: Blockchain-based valuation and transaction methods. *Blockchain in Healthcare Today*. Retrieved from <https://doi.org/10.30953/bhty.v5.185>
- Zarifis A, Cheng X, 2022. The business models of NFTs and fan tokens and how they build trust. *Journal of Electronic Business and Digital Economics* 1(1/2): 138-151. Retrieved from <https://doi.org/10.1108/JEBDE-07-2022-0021>
- Мирошниченко А, Birch К, 2024. Constructing digital assets through blockchain technologies? Unpacking the techno-economic configuration of non-fungible tokens. *Social Studies of Science* 55(4): 631-651. <https://doi.org/10.1177/03063127241286447>