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Artificial Intelligence in the Sport Sector

A paper from the SHARE 2.0 initiative

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Artificial Intelligence in the Sport Sector

A paper from the SHARE 2.0 initiative

Directorate-General for Education, Youth, Sport and Culture
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1. Introduction

About SHARE 2.0 and this paper

SHARE 2.0 *is a European Commission initiative to foster dialogue, build capacity and facilitate collaboration among over 450 sport stakeholders in the fields of EU funding, health, innovation and sustainability. It is based around four* ***Communities of Practice (CoPs)*** *which include public authorities, grassroots sport organisations, federations, and policy experts. CoPs are based on a participatory method that allows all members to take an active role.*

To reflect and address the political priorities of the European Commission[1] *and Draghi's report on competitiveness*[2]*,* ***the CoP on Innovation discussed the ongoing and emerging challenges of the European sport sector at the annual SHARE 2.0 conference and published two ideas papers on digitalisation*[3] *and entrepreneurial ecosystems*[4] *in sport.*** *Since then, the Community has identified key topics of interest through a bottom-up approach which formed the basis for the development of this paper.*

Members of the CoP on Innovation Steering Group have identified one topic that deserves particular attention in early 2025: "Artificial Intelligence (AI) in the sport sector". This topic was discussed and analysed during several Steering Group meetings. The outcome of these discussions among key stakeholders of the European sport sector, to a large extent, has informed the outline and contents of this paper.

AI has developed from a technical area mostly dealt with by data scientists, researchers and specialised engineers, into a technology many people now interact with directly – for instance through the use of generative AI models. Developing and adapting AI models into society helps to increase the productivity and competitiveness[5]. The EU AI act of 2024 provides a framework for the

[1] Von der Leyen, U., *Political Guidelines for the next European Commission 2024–2029.* European Commission, Strasbourg, 2024, https://commission.europa.eu/about/commission-2024-2029/president-elect-ursula-von-der-leyen_en

[2] Draghi, M., *The future of European competitiveness Part A | A competitiveness strategy for Europe*, European Commission Directorate-General for Communication, 2024, https://commission.europa.eu/topics/eu-competitiveness/draghi-report_en

[3] European Commission: Directorate-General for Education, Youth, Sport and Culture, *SHARE 2.0 community of practice on innovation – Ideas paper on digitalisation as a source of competitiveness in the sport sector*, Publications Office of the European Union, 2025, https://data.europa.eu/doi/10.2766/1581737

[4] European Commission: Directorate-General for Education, Youth, Sport and Culture, *SHARE 2.0 community of practice on innovation – Ideas paper on creating an entrepreneurial ecosystem for sport sector start- and scale-ups*, Publications Office of the European Union, 2025, https://data.europa.eu/doi/10.2766/4080554

[5] European Commission, 'Shaping Europe's leadership in artificial intelligence with the AI continent action plan' accessed 13 August 2025, https://commission.europa.eu/topics/eu-competitiveness/ai-continent_en

regulation of AI in the EU, which takes a risk-based approach to AI systems depending on how they work, the data they use, and what they are used for[6].

This paper has been edited with the primary objective of helping sport stakeholders to explore the opportunities that AI offers to the sector.

The context for AI in the sport sector

The adoption of AI in sport is in many ways a continuation of the digitalisation efforts that have been underway in the sector for many years. The Fifth EU Work Plan for Sport (2024-2027) set out priorities and strategic objectives for sport across the European Union[7], focussing on how to boost the economic value of sport, improve sustainability, and link physical and mental health[8]. **The EU Work Plan for Sport emphasises the role of innovation and digitalisation as a driver for the economic and sustainable development of the sport sector, but does not directly mention AI.**

The adoption and use of **AI can create substantial benefits across the whole sport sector, with opportunities to optimise performance, administration, and experiences.** Routine tasks that are essential for the operations of all kinds of sport activities such as human resources (HR), financial planning, or communication can be done more quickly with AI tools. AI can also optimise sport performance, injury prevention and communication to produce better results with less user know-how than traditional digital tools, thanks to automated processes.

AI in sport increases access to digital tools for everyone: new tools can produce useful recommendations or outcomes from existing data without the need for specialised expertise, which has been an issue for smaller organisations due to gaps in digital literacy. AI can help grassroots clubs and volunteers by automating routine tasks allowing them to focus more on core sport activities. It can offer more options for training, ultimately making **more people physically active,** which would be a benefit to all of society.

The integration of AI tools into the daily activities of sport organisations does come with significant challenges and reasonable concerns. Successfully implementing AI tools in sport organisations requires investments both in the education of users, as well as in the digital and physical tools and infrastructure. The latter is a particular issue for grassroots clubs with limited

[6] Regulation (Eu) 2024/1689 Of The European Parliament And Of The Council of 13 June 2024 laying down harmonised rules on artificial intelligence and amending Regulations (EC) No 300/2008, (EU) No 167/2013, (EU) No 168/2013, (EU) 2018/858, (EU) 2018/1139 and (EU) 2019/2144 and Directives 2014/90/EU, (EU) 2016/797 and (EU) 2020/1828 Regulation - EU - 2024/1689 - EN - EUR-Lex

[7] Council of the European Union, *Resolution of the Council and of the Representatives of the Governments of the Member States meeting within the Council on the European Union Work Plan for Sport (1 July 2024 – 31 December 2027),* General Secretariat of the Council, 9771/24, 2024, https://data.consilium.europa.eu/doc/document/ST-9771-2024-INIT/en/pdf.

[8] European Commission, 'Adoption of New EU Work Plan for Sport (2024 -2027)', European Commission Website, 23 May 2024, accessed 4 March 2025, https://sport.ec.europa.eu/news/adoption-of-new-eu-work-plan-for-sport-2024-2027

access to funding. Data privacy rules and concerns over the so-called 'black box' nature of AI-assisted decision-making should also be considered carefully. AI models can be based on, for example, health data, video recordings, historical data, etc., and each of these have specific legal and ethical concerns regarding their use. For clubs and private users to have confidence in the way their data is being used and the recommendations which the models generate, transparency and trust in the providers of AI solutions are needed before adoption. Fostering collaboration between stakeholders in the sport sector is a first step in this process, in which SHARE 2.0 can play a part.

The following paper provides background information regarding the role of AI in the sport sector **and offers recommendations on how AI can be approached. The ideas and examples proposed are based on input from the CoP in Innovation and its Steering Group,** and they are addressed to the SHARE 2.0 Community to implement and disseminate.

To continue the conversation on Artificial Intelligence in sport, join SHARE 2.0.

The platform will also give you access to insights and collaborative opportunities on innovation, health and sustainable sport.

2. What is AI in the sport sector?

2.1 Definition of AI

Defining AI is challenging because its meaning can differ greatly depending on the perspective - whether technical, regulatory, or philosophical. This variation reflects AI's wide range of applications and its rapidly changing nature. This paper will use the following definition of AI which offers a functional and application-oriented perspective[9].

"Artificial intelligence (AI) refers to systems that display intelligent behaviour by analysing their environment and taking actions – with some degree of autonomy – to achieve specific goals. AI-based systems can be purely software-based, acting in the virtual world (e.g. voice assistants, image analysis software, search engines, speech and face recognition systems) or AI can be embedded in hardware devices (e.g. advanced robots, autonomous cars, drones or Internet of Things applications)[10]."

There are three elements that are key to the functioning of any AI system[11]:

- **Perceive:** This is the step where an AI gathers information from its environment. AI might use sensors, cameras, or data inputs to collect information. For example, a self-driving car uses cameras and sensors to perceive the road and its surroundings. This could be the case of a smart watch gathering data on the number of steps, calories or the heart rate of its user.
- **Analyse:** After gathering information, the AI processes and makes sense of this data. This could involve interpreting visual inputs, recognising patterns, or understanding context. In brief, it tries to understand what is happening. For instance, after gathering data a smart watch analyses the data to understand how well an athlete is performing (e.g. to identify overtraining).
- **Decide:** In this final step, the AI uses the insights from the analysis to make a decision or take action. This decision is based on the pre-set goals or objectives the AI is programmed to achieve. In the example of the smart watch, the device can now suggest an action to the athlete (e.g. reduce the training load, focus on other exercises, etc.).

[9] Article 3 oif the AI Act defines the AI systems as "*means a machine-based system that is designed to operate with varying levels of autonomy and that may exhibit adaptiveness after deployment, and that, for explicit or implicit objectives, infers, from the input it receives, how to generate outputs such as predictions, content, recommendations, or decisions that can influence physical or virtual environments*". Artificial Intelligence Act

[10] European Commission, *Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions on Artificial Intelligence for Europe*, Brussels, 2018, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:52018DC0237

[11] European Commission, *A definition of Artificial Intelligence: main capabilities and scientific disciplines*, 2018, https://digital-strategy.ec.europa.eu/en/library/definition-artificial-intelligence-main-capabilities-and-scientific-disciplines

On a broader level, the scientific discipline of AI is focused on two broad techniques which underlie the functioning of AI:

- **Reasoning and decision-making** in AI involve techniques that help systems to make sense of observed data and decide on actions. This process starts with modelling knowledge, where the AI transforms raw data into useful information, like turning individual player statistics into a team's performance analysis. Then, it moves to using knowledge by applying set rules and procedures to reason through problems, much like solving a puzzle. This can involve planning actions, scheduling tasks, or searching through solutions to find the best one. The final step is choosing actions, where the AI evaluates the possible solutions and selects the most effective course of action. This entire process is complex and requires the use of a combination of various methods to ensure the AI can make intelligent and efficient decisions.
- **Learning** is a group of techniques which includes machine learning, neural networks, deep learning, decision trees and other learning techniques (see **Annex 1** for definitions). These techniques allow an AI system to *learn* by finding patterns and making predictions in data based on the AI techniques in their system. This enables it to perform tasks which it has not been explicitly programmed to do[12].

2.2 Practical application of AI in the sport sector[13, 14,15]

The potential for the integration of AI systems into software or physical tools that can be used in the sport sector is significant. While each sport has characteristics that make it unique, there are still many common features that make AI solutions capable of addressing challenges across the sector. Additionally, AI systems or models can be customised to meet the specific requirements and needs of each sport.

[12] Brown, S., 'Machine learning, explained', MIT Management Sloan School, 21 April 2021, accessed 13 August 2025, https://mitsloan.mit.edu/ideas-made-to-matter/machine-learning-explained

[13] Peranzo, P., 'How Artificial Intelligence Is Transforming the Sports Industry?', Imaginovation, 1 May 2024, accessed 13 August 2025, https://imaginovation.net/blog/ai-in-sports-industry/

[14] Walch, K., 'How AI Is Revolutionizing Professional Sports', Forbes, 16 August 2024, accessed 13 August 2025, https://www.forbes.com/sites/kathleenwalch/2024/08/16/how-ai-is-revolutionizing-professional-sports/

[15] Bhardvaj, C., 'AI in Sports – How is artificial intelligence redefining the sports industry? Real-world examples', 18 December 2024, accessed 13 August 2025, https://appinventiv.com/blog/ai-in-sports/

Examples of how AI can improve the management and the practice of sport

- **Club management:** Daily management of a sport club involves a range of repetitive administrative tasks such as athlete registrations, membership payments, or communication and these are typically done by volunteers. Many of these can be done automatically or with little supervision from staff or volunteers, freeing up time for other tasks. AI systems that generate messages and send them to the correct people or publish them automatically are already being used by small clubs[16]. In doing so, time and resources can be saved and spent on activities more directly related to the sport.
- **Advertising:** The introduction of AI systems to analyse and target marketing efforts is the next step in the data revolution in advertisement initiated by digital platforms. Using AI tools allows for the acceleration of manual marketing tasks, the monitoring of campaigns in real-time, and quicker and more personalised content targeting across platforms. This can ultimately increase revenue for clubs and allow for more investment in sport[17]. AI is already being used by the German Bundesliga in its advertising of football[18].
- **Development of AI-powered equipment:** Sport equipment is improved using feedback to enhance and upgrade products. AI allows for better monitoring of the use of products which allows precise updates to be made, for example through integrated sensors in golf clubs or running shoes. Tennis rackets designed with the help of AI are already being produced and the integration of sensors into footballs is being used to support AI-powered refereeing[19].
- **Officiating assistance:** For referees, a key challenge is to observe and decide in-game decisions or scores quickly and accurately. AI officiating systems can be used to detect the movements of athletes in real-time and then translate these into guidance for referees on how to score performance, or to identify whether irregular behaviour has occurred. Modifying each system to the specific sport will also allow the AI systems to compare performance against historical data and make decisions more accurate and consistent over time[20].

[16] Clubee, 'Manage your Sports Organization with Artificial Intelligence (AI)', accessed 13 August 2025, https://get.clubee.com/en/sports-management-with-artificial-intelligence-clubee

[17] Widup, J., '10 Applications of AI in Sports Marketing', Pixis, 28 February 2025, accessed 13 August 2025, https://pixis.ai/blog/ai-in-sports-marketing/

[18] Insideworldfootball, 'Bundesliga greenlights Supponor's virtual ad technology for league-wide use', 8 April 2022, accessed 13 August 2025, https://www.insideworldfootball.com/2022/04/08/bundesliga-greenlights-supponors-virtual-ad-technology-league-wide-use/

[19] Marian-Petre Prăjescu and Beatrice Aurelia Abalașe, 'Artificial Intelligence in Tennis. A Social Perspective' Studia Universitatis Babeș-Bolyai Educatio Artis Gymnasticae, accessed 13 August 2025, https://www.researchgate.net/publication/394654324_Artificial_Intelligence_in_Tennis_A_Social_Perspective

[20] Mailard, S., 'How AI is revolutionising sports timing', europastar, May 2024, accessed 13 August 2025, https://www.europastar.com/the-watch-files/swatch-group/1004114384-how-ai-is-revolutionising-sports-timing.html

Examples of AI improving performance in sport

One inherent aspect of sport is competition, and athletes at all levels try to improve their performance. As most sports are reiterations or combinations of relatively similar movements and patterns, AI systems can analyse and predict ways to optimise performance for both individuals and teams.

- **Athlete performance:** AI products can connect smart equipment such as wearable technology or video recordings with AI software. This can then support coaches in tailoring individual training regimes based on the needs of each athlete for their sport and level of practice. These tailored regimes can help to improve techniques, nutrition and fitness and have been used by participants in the Olympics and Paralympics in preparation for the 2024 games[21].
- **Team performance:** Using data collected by wearable technology on individual players and video recordings of team performance, AI models can analyse and deduce a range of valuable information for team performance. This can help coaches to analyse game performance, find patterns and trends, determine individual player contributions, make tactical in-game decisions, and help to predict the future performance of players. Football club Liverpool FC[22] and the handball club SG Flensburg-Handewitt are already using these techniques[23]. This assistance can also improve **scouting**, since AI models can spot patterns that indicate high future performance in athletes.
- **Injury prevention:** Injuries are a common and problematic part of participation in sport. In one emergency department in Ireland, sport injuries accounted for 14% of incoming patients[24]. Using sensors, AI systems can continuously monitor physical performance and fatigue data. Combined with inputs of previous injury history data, AI models can alert athletes to potential injuries and help to modify training and recovery programmes in order to mitigate identified risks. Such methods are currently being used by the medical teams of football clubs such as SSC Napoli[25].

[21] Ho, V., 'How world-class athletes are turning to the power of AI and data', Microsoft, 17 December 2024, accessed 13 August 2025, https://news.microsoft.com/source/features/ai/how-world-class-athletes-are-turning-to-the-power-of-ai-and-data-2/

[22] Electronicspecifier, 'Google DeepMind and Liverpool FC create TacticAI', 25 March 2024, accessed 13 August 2025, https://www.electronicspecifier.com/products/artificial-intelligence/google-deepmind-and-liverpool-fc-create-tacticai/

[23] Faculty of Science, 'Scientists develop AI that can predict goals and make performance measurable', Paderborn University, 29 July 2022, accessed 13 August 2025, https://nw.uni-paderborn.de/en/news-detail/wissenschaftler-entwickeln-ki-die-tore-vorhersagen-kann-und-leistungen-messbar-macht

[24] Reis, F. J. J., Alaiti, R. K., Vallio, C. S., & Hespanhol, L., *Artificial intelligence and Machine Learning approaches in sports: Concepts, applications, challenges, and future perspectives*. Brazilian journal of physical therapy, 28(3), 101083. 2024, https://doi.org/10.1016/j.bjpt.2024.101083

[25] Performance Hub, 'Isokinetic 2023: How AI Became an Ally to Performance and Medical Staff at SSC Napoli', Zone7, 6 June 2023, accessed 13 August 2025, https://zone7.ai/performance/events-webinars/isokinetics-2023-how-ai-became-an-ally-to-performance-and-medical-staff-at-ssc-napoli/

Examples of AI improving fan experiences

- **Sport journalism, highlight creation and commentary:** Communicating what happens at sport events, either through live commentary or after a match, requires fast collection and communication of updates. AI systems can help commentators to quickly access relevant information and statistics[26]. Similarly, these systems can automatically create video highlights and generate appropriate text commentary to publish these online. Variations of all of these techniques are already being used by the sports media company ESPN and by the Associated Press[27].
- **Personalised content or interaction:** AI systems can be integrated into streaming services or other sport platforms to target content to the specific interests of each fan[28]. This would allow platforms to provide automatic live updates which highlight particular aspects of a game or competition that appeal to the specific viewer, e.g. statistical information, coverage in specific languages or personal biographies of athletes if the fan has previously expressed an interest in these. Automatic language translation and customised writing styles are already being used by the German Bundesliga to create commentary for live football events[29].
- **Stadium experience assistance**: A wide range of processes are required to create a seamless, well-functioning and enjoyable stadium experience for fans. Here there is potential for AI systems to help optimise the organisation of traffic flow or crowd management, to assist with stadium navigation, and to personalise offers to fans while they are in the stadium based on their prior interests and purchases[30]. One example of this is the use of AI by the German police for crowd management during the 2024 European Championship in football[31].
- **Virtual worlds through Virtual Reality (VR) headsets:** Developments in the use of VR headsets allow the user to experience an immersive digital world and have promising perspectives for use in sport. They allow a series of applications to be used, including customised training environments, immersive fan experiences, or augmented reality where users see both digital and real things through the headset. Early versions of this are being used to train quarterbacks in American Football by simulating drills without the physical toll of practice[32]. In the future, the perspectives for the use of VR by fans could also be a game changer.

[26] Winslow, G., 'Warner Bros. Discovery Launches Generative AI-Powered Cycling Central Intelligence Platform', TVTech, 5 April 2025, accessed 13 August 2025, https://www.tvtechnology.com/news/warner-bros-discovery-launches-generative-ai-powered-cycling-central-intelligence-platform?utm_source=chatgpt.com

[27] Jones, T., ' Breaking down ESPN's decision to use AI to write some game stories ', Poynter, 6 September 2024, accessed 13 August 2025, https://www.poynter.org/commentary/2024/espn-artificial-intelligence-pll-nwsl-coverage/

[28] FasterCapital, 'Sport artificial intelligence: AI Driven Fan Engagement: Creating Personalized Experiences in Sports', 30 March 2025, accessed 13 August 2025, https://fastercapital.com/content/Sport-artificial-intelligence--AI-Driven-Fan-Engagement--Creating-Personalized-Experiences-in-Sports.html

[29] Abid, M., 'Revolutionizing fan engagement: Bundesliga generative AI-powered live commentary', Amazon Web Services, 9 July 2024, accessed 13 August 2025, https://aws.amazon.com/blogs/media/revolutionizing-fan-engagementcer-bundesliga-generative-ai-powered-live-commentary/

[30] Chicas, J., 'Smart Stadiums: Redefining Fan Experiences in Sports', Applaudo, 24 August 2024, accessed 13 August 2025, https://applaudo.com/en/insights/articles/smart-stadiums-redefining-fan-experiences-in-sports/

2.3 Challenges and considerations limiting the uptake of AI

Integration into existing systems and digital literacy

Because of the sector's historically slow pace of digitalisation, many sport federations and clubs continue to rely on fragmented, outdated digital infrastructures which were not designed to accommodate advanced technologies. As a result, AI tools must be adapted to fit within a patchwork of legacy systems, often lacking interoperability or standardised data formats. This fragmentation hinders the scalability and effectiveness of AI-driven solutions, from performance analytics to fan engagement. To fully realise the potential of AI, the sector must first address foundational issues in digital readiness, system integration, and data governance across national and organisational boundaries.

As the SHARE 2.0 *Ideas Paper on digitalisation as a source of competitiveness in the sport sector* shows, digital skills are often lacking in sport clubs[33]. In addition, younger generations – which tend to be more inclined to adopt new trends and technologies – broadly lack basic digital skills. This leaves smaller actors such as grassroots clubs with the practical challenge of finding individuals who can implement new solutions[34].

Data availability

AI tools use the data they receive to process information and give recommendations or conduct analysis. Most tools require a combination of standard digital devices like computers or phones, specialised sport equipment such as wearables, sensors, or cameras to collect data, and AI software systems to process that data. Collecting and making data available to AI tools can therefore be a challenge for many organisations, because it requires the financial investment to purchase the equipment, the correct installation of the data collection tools, the continuous maintenance and operation of these tools, and the correct processing of the data collected.

[31] George, N., 'Euro 2024: The Pinnacle of Technological Advancements in Football', Zone14, 10 July 2024, accessed 13 August, https://zone14.ai/en/blog/euro-2024-technology-in-football

[32] Ogus, S., 'How Clemson Embraced Virtual Reality And Biometric Data Analysis To Become College Football's Dominant Program', 13 January 2020, accessed 13 August 2025, https://www.forbes.com/sites/simonogus/2020/01/13/how-clemson-embraced-virtual-reality-and-biometric-data-analysis-and-became-college-footballs-dominant-program/

[33] European Commission: Directorate-General for Education, Youth, Sport and Culture, *SHARE 2.0 community of practice on innovation – Ideas paper on digitalisation as a source of competitiveness in the sport sector*, Publications Office of the European Union, 2025, https://data.europa.eu/doi/10.2766/1581737

[34] ICILS study: ICILS 2023 International Report: An international perspective on digital literacy 2023, published 2024, accessed 27. August 2025, ICILS 2023 | IEA.nl

As an example, in order to collect footage of junior league football games to improve team performance, voluntary coaches or administrators need to bring out and set up the equipment for every game or practice session and ensure that it is operating correctly. While this can seem like a minor task, it requires staff to know how to operate the equipment, coordination of the storage and maintenance of the equipment, and the replacement of equipment that breaks or goes missing. Finally, the data gathered needs to be correctly labelled and uploaded to the AI software and the results need to be used correctly, which requires some level of training or digital skills. Collecting and using data consistently over a longer period can therefore pose a significant barrier to the effective use of AI tools[35].

Biases in data and models

The potential benefits of the use of AI in sport are based on AI systems reasoning, learning, and deciding on the optimal path to reach a specified goal, based on available data. Using imbalanced or incorrect data to train the AI models, or in the daily use of the tools, can lead to significant harmful effects and reinforce racist or sexist patterns which might be present in the datasets used by the AI systems[36]. This can happen if the training data is primarily based on data from men or people from a specific ethnic background, which can lead to worse outcomes for people who do not belong to these groups. Similarly, the use of historical data to produce predictions can result in unfair outcomes, especially in sports where the standards for performance are changing. A high degree of transparency and explainability in how decisions are made in the algorithm can make it possible to deduce if the algorithm is fair and unbiased[37], but this places high demands on users, sport federations or regulators to control the AI systems being used.

Data protection

Collecting, processing and storing athletes' data raises major questions related to the protection of this data. As health data are considered as sensitive data, physical, medical and biometric records must be handled with special care under both existing (General Data Protection Regulation, GDPR) and future regulations (AI Act) because misuse, leaks or sharing is especially problematic[38, 39]. For staff

[35] AI models require data to be standardised to be processed (e.g. cleared of non-useful data and correctly labelled)). In addition, to allow AI models to predict outcomes based on past data, data needs to be stored in a safe and secure way. As most sport data is sensitive, open platforms cannot be used for this reason.

[36] Scheuerman, M. K., Pape, M., & Hanna, A., *Auto-essentialization: Gender in automated facial analysis as extended colonial project*, *Big Data & Society*, *8*(2), 2021, https://doi.org/10.1177/20539517211053712

[37] Jae-Hak K., Janghyeon K., Hoseok K., Bo-Young Y., *Ethical implications of artificial intelligence in sport: A systematic scoping review*, Journal of Sport and Health Science, Volume 14, 101047, ISSN 2095-2546, 2025, https://doi.org/10.1016/j.jshs.2025.101047.

[38] Gerrish Legal, 'AI in Sport: The Effect on Athlete Privacy', accessed 13 August 2025, https://www.gerrishlegal.com/blog/ai-in-sport-the-effect-on-athlete-privacy

[39] Jae-Hak K., Janghyeon K., Hoseok K., Bo-Young Y., *Ethical implications of artificial intelligence in sport: A systematic scoping review*, Journal of Sport and Health Science, Volume 14, 101047, ISSN 2095-2546, 2025, https://doi.org/10.1016/j.jshs.2025.101047.

and club volunteers who do not have legal and/or technical expertise, it can be difficult to assess whether AI systems follow data protection regulations. They may not be aware of their obligations, which can lead to hesitation to adopt new AI tools that can boost performance or processes in general. As many of the providers of tools in the AI sport market are also start-ups or scale-ups, similarly they may not have the in-house expertise or the name recognition to reassure clubs or athletes of their compliance with relevant rules and regulations.

Another concern relates to the ownership of data and whether any of the collected data is transferred to third parties. The supply chain of AI models is complex, and it is likely that small companies will not develop the technology in-house but rather licence it from third-party AI providers because of the technical complexity of these models. This will inevitably mean that data will be shared with third parties, which can be located outside of the EU. This triggers extra compliance costs and requirements with regard to international data transfers in accordance with GDPR.

Ethical implications

As football matches or other athletic performances can now generate millions of data points per player which can be assessed by AI, it becomes difficult for athletes to perform without thinking about how their training will be perceived by the algorithm. It can have significant consequences for players' futures, because data could be used as a tool to negotiate contracts for professional athletes. While *good data points* are positive, a *negative trend* can result in a lower salary. For athletes, this raises concerns about control of their data and transparency in how they are being assessed by the AI models and is something which organisations representing athletes are increasingly raising concerns about[40].

Similarly, the collection of data can also have implications for fans who might not realise their data is being processed. The use of facial recognition to avoid hooligans entering events raises concerns about the individual freedom and respect of rights for the many fans who are attending an event without any previous record of breaking rules. To identify hooligans, all individuals in a crowd have their biometric data analysed. While the software is created to identify the faces on their watchlists, 'false positives' where people who do not have a history of antisocial behaviour are flagged, can result in the application of security measures[41].

[40] FIFPro, 'Player Data: Managing technology and Innovation, A Player-Centric Rights Perspective', accessed 13 August 2025, https://fifpro.org/media/ik5harp1/player-data_managing-technology-and-innovation.pdf

[41] Lund, J., 'Danish DPA approves Automated Facial Recognition', EDRi, 19 June 2019, accessed 13 August 2025, https://edri.org/our-work/danish-dpa-approves-automated-facial-recognition/

Sport specificity

While some AI tools can help to improve the fan experience across sports in areas such as club management and marketing, other tools focused on performance or officiating assistance require a high level of customisation to function well for athletes in each sport. This results in increased availability of tools within the most popular sports such as football, while it can be difficult for more niche sports to find tools and software developed specifically for their needs. Similarly, using tools developed for application in other sports can increase the risk of AI-based recommendations delivering less than optimal advice for the individual athlete.

3. AI's impact on grassroots and amateur sport

Sport in Europe has traditionally been organised along the key features and values of the European Sport Model: a pyramid-like hierarchy connecting grassroots participation with elite-level competition[42]. Some financial solidarity between different levels, membership fees and public funds supports the operations of grassroots clubs at the bottom of the pyramid, but they are still largely reliant on voluntary work for both administrative and sport-related activities. In general, grassroots sport is also characterised by strict financial limits and local conditions for sport facilities, which are typically dependent on the priorities and capacities of local governments, and as such can pose significant challenges.

A major survey into what sport clubs in Europe consider to be their main problems highlights the scale of these challenges. It shows the main reasons for concern identified by sport clubs (identified as a big or very big problem): the availability of sport facilities (27.6 %), the recruitment of volunteers at board level (26.9 %), the financial situation of the club (24.2 %), the recruitment of coaches/instructors (24.2 %), and the recruitment/retention of members (21.2 %). On the other hand, the survey shows a contrasting picture with 36.4% of the clubs which responded reporting no issues in accessing sport facilities or experiencing a challenging financial situation (34.2%)[43].

It is difficult to establish what the full potential of AI-powered tools and software will be in the future. However, there are currently AI products on the market or in development that have immense potential to assist clubs in their day-to-day activities. They could alleviate the pressure on volunteers and thereby help with recruitment and retention. AI systems which help to minimise the workload associated with administrative or management tasks allow time and energy to be spent on activities which are directly related to sport, which is typically what motivates volunteers in the first place.

While AI tools can be effective in keeping volunteers active, they can also mitigate the problems associated with having fewer or less experienced volunteers. In grassroots clubs, access to experienced coaching can be limited due to high turnover, limited training or lack of interest in a specific sport in a particular area. **AI coaching tools can help identify gaps and support coaches and players** alike with more information within specialised areas. This can help to improve the availability or performance of sport coaches, thus offering better options for the

[42] European Commission: Directorate-General for Education, Youth, Sport and Culture, Sennett, J., Le Gall, A., Kelly, G., Cottrill, R. et al., *Study on the European sport model – A report to the European Commission*, Publications Office of the European Union, 2022, https://data.europa.eu/doi/10.2766/28433

Seippel, Ø., Breuer, C., Elmose-Østerlund, K., Feiler, S., Perényi, S., Piątkowska, M., & Scheerder, J., *In Troubled Water? European Sports Clubs: Their Problems, Capacities and Opportunities*, Journal of Global Sport Management, 8(1), 203–225, 2020, https://doi.org/10.1080/24704067.2020.1806493

development of athletes[44]. Virtual coaching programmes can also help to find and use drills, exercises or training programmes for each sport with minimal financial or physical barriers. When this can be combined with training data or videos, it can potentially also monitor, adjust and analyse players' training.

The use of AI tools can also help to overcome a lack of funding at the local level. Nearly two-thirds of the grassroots clubs surveyed reported financial difficulties. It is estimated that households provide 56.3% of the total grassroots sport budget, while local and national governments contribute 40%, and sponsorship accounts for only 2.2%[45]. AI tools can provide one potential way of alleviating financial pressure by **helping grassroots clubs to attract additional sponsorship funds**. AI marketing tools can be used to analyse and match the content, type of viewers, and interactions which the clubs have through their online presence, with potential advertisers. In doing so, it can provide evidence of the Return on Investment (ROI), which companies expect before investing in advertising. By integrating AI tools into existing digital platforms, smaller clubs which did not previously have the resources or competences to document their online reach, can reduce the barriers to attracting new revenue streams[46].

On the negative side, grassroots clubs are generally more exposed to **concerns regarding data availability, data protection, sport specificity, and biases in AI systems**, because clubs at this level lack the financial and human resources to adapt the AI products and solutions to their own context. Small, grassroots and voluntary organisations often do not have the capacity to ensure that their data are being processed and stored safely. This can lead to a reluctance to implement AI solutions when considering new digital tools[47]. There are however also potential solutions for grassroots level clubs. They could use the expertise or experiences of some younger or more digitally aware members in the implementation of AI tools, helping to drive change in the organisations.

Amateurs outside of clubs can also benefit from some of the opportunities offered by AI tools, particularly those related to athlete performance and **injury prevention**. While even grassroots clubs offer some degree of coaching and training to their members, **unaffiliated amateur** athletes typically rely on their own research for expertise related to their sport. At the same time, the share of people who perform sport and physical activities at home or in public spaces has increased in recent years, while the share being active in sport clubs has

[44] Sportsfusion, 'Revolutionising Grassroots Player Development With AI', February 2025, accessed 13 August 2025, https://www.sportsfusion.co.uk/revolutionising-grassroots-player-development-with-ai/

[45] Eurostrategies, *Study on the funding of grassroots sports in the EU With a focus on the internal market aspects concerning legislative frameworks and systems of financing*, Publications Office of the European Union, 2011, https://liigume.ee/wp-content/uploads/2025/03/funding-grassroots_sport_eu_2011.pdf

[46] Entyx, 'How AI Is Bridging the Gap Between Grassroots and Professional Sports Sponsorships', Gamers, February 2025, accessed 13 August 2025, https://vocal.media/gamers/how-ai-is-bridging-the-gap-between-grassroots-and-professional-sports-sponsorships

[47] Engso Youth, *THREAT OR OPPORTUNITY? Impact of digital technologies on grassroots sport with the focus on Artificial Intelligence*, Position Paper, April 2022, https://engsoyouth.eu/wp-content/uploads/2022/05/6acfa9_aa27cf69778a45fc8264096270073ef0.pdf

remained stable[48]. For people who exercise without being a member of a club, AI tools offer an opportunity to improve their access to training programmes, health monitoring, and sparring.

Exergaming is another form of sport or physical activity in which AI tools can have a significant impact outside of organised sport[49]. This technology-driven form of physical activity which seeks to gamify activities, can also make use of AI tools both in person and online. For example, the integration of AI-powered VR headsets can create an immersive virtual biking experience, while the use of athlete performance and injury prevention tools can help people to be physically active this way, in the same way that they can within organised sport.

[48] Rask, S., Le Coq, C. and Storm, R. K., *European sport: one or several sporting realities?*, Play The Game, June 2024, https://www.playthegame.org/publications/european-sport-one-or-several-sporting-realities/

[49] Witherspoon, L., *ACSM Information On… Exergaming*, American College of Sports, 2013, https://healthysd.gov/wp-content/uploads/2014/11/exergaming.pdf

Case study: Clubee – an AI-powered club management tool

Clubee is a Luxembourgish digital platform and virtual assistant designed to take over some of the repetitive administrative work that volunteers would otherwise have to do[50]. Decisions are still made by managers or volunteers, but the virtual assistant can execute a broad range of work using AI.

Areas which can be handled through the platform include:

- **Membership management**: The platform allows the organisation, digitalisation and automation of a range of the day-to-day activities of a sport club, such as managing club licences, documenting medical checks, and sending out invoices. The integrated AI tool also analyses developments in the club and suggests tasks or decisions which the user might want to take.
- **Team management**: Clubee allows coaches to simplify the process of scheduling and planning activities. It can send out automatic invitations, reminders or check availability among players, and help assign roles for an upcoming event.
- **Federation management**: Similar to the assistance it can provide at local club level, the platform also offers federations the possibility of automating communication, marketing, finance, consultation and Customer Relationship Management (CRM) functions. For a smaller sport federation, this can free up valuable volunteer resources.
- **Communication**: For grassroots clubs, community engagement is a part of core activities to attract and retain members. By utilising AI, the system can generate and share social media posts or newsletters with minimal human input, or automate external communication processes entirely.
- **Sponsorship**: Through the platform, clubs can manage sponsor databases, automate invitations and newsletters to keep sponsors engaged, and integrate their content into the club's online communication across platforms.

[50] Luxembourg.lu, 'Clubee – an ICT startup story', 7 February 2025, accessed 13 August 2025, https://luxembourg.public.lu/en/invest/your-business-in-luxembourg/startup-ict-clubee.html

4. AI's influence on professional sport

In professional sport, athletes and coaches are always looking for new ways to improve performance, optimise training, and analyse developments. In recent years this has increasingly been done through the adoption of digital tools and data analysis to monitor both practices and competitive performance, and give athletes and coaches the ability to better design training programmes and avoid injuries. AI-powered systems are in many ways a continuation of this development, which offers tremendous potential to generate more data and analyse the data more comprehensively, thereby giving athletes a chance to push the boundaries of their sport. The automated processes and analysis which AI tools deploy also offer the potential for many more people to utilise the benefits of data-driven performance tracking, without the data analysis skills required by current tools.

One area where advanced AI tools are already being used is in **talent scouting**. The process of finding talented young athletes for a specific sport requires access to performance characteristics from a larger cohort of children and young people and can be incredibly time- and resource-consuming. One AI tool which is currently being developed through cooperation between Intel, the International Olympic Committee (IOC), and the National Olympic Committee of Senegal, allows for talent identification through any device with a camera[51]. Through video analysis, the AI software delivers processed statistics to the talent scouts, who can use it to identify potential future athletes across a variety of sports where the children and young people might be naturally inclined to perform well. Overall, the AI tool allows for more children and young people to be screened for potential athletic talents, requiring less staff training, and using tools which are already widely available, giving a chance to children and young people in communities that might otherwise not be reached using traditional scouting methods.

AI tools are also already being deployed to help make **tactical decisions** in games at the highest level. Current AI systems are very good at creating predictive and generative models based on the many hours of available video content and data that is publicly available for many sports. This can then be used to simulate potential outcomes of frequently occurring situations and help coaches to make in-game adjustments based on instantly generated tactical insights from the AI assistants. One collaboration in this area is between Liverpool FC and Google DeepMind on set pieces in football. The AI system's suggestions for tactical setups for set pieces were preferred 90% of the time over tactical setups by human coaches. While these systems are typically initially developed for use by the largest organisations within specific sports, prior digitalisation

[51] Intel, 'Intel-Powered AI Platform Technology Might Spot Next Olympic Hopeful', 29 July 2024, accessed 13 August 2025, https://newsroom.intel.com/artificial-intelligence/intel-powered-ai-platform-technology-might-spot-next-olympic-hopeful

trends show that these new tools will likely spread to smaller professional clubs over time, when proven effective.

For professional sport, the benefits of adopting AI are not only emerging in relation to athletic aspects of the industry. AI systems are also increasingly being used to improve refereeing accuracy and speed. In professional football, Video Assistant Referee technology already extensively uses AI tools. A combination of cameras and sensors track the movements of players and the ball to provide semi-automated offside rulings quicker than human referees are able to, and improve the flow of the game[52]. Similarly, in some of the largest competitions in tennis such as Wimbledon, an AI-powered automated electronic line calling system is replacing line judges to improve accuracy[53]. For professional competitions where the organisational set-up is already extensive, the barriers to implementing AI solutions are smaller. Additionally, the data generated can benefit athletes in many performance-related activities too, by giving them a better understanding of the sequences leading to specific outcomes[54].

Overall, while the opportunities identified for the professional sport sector are often difficult to implement for grassroots clubs, professional clubs can take full advantage of the same administrative and performance-related tools, with fewer financial and training barriers. Combined, this allows for almost all facets of professional sport clubs to utilise some form of AI tools in their daily work.

[52] Strategic Intelligence, 'How AI is working behind the scenes at the European Championship', Verdict, 28 June 2024, accessed 13 August 2025, https://www.verdict.co.uk/ai-technology-in-football/?cf-view&cf-closed

[53] Sky Sports, 'Wimbledon: All England club to replace all 300 line judges after 147 years with electronic system next year', 9 October 2024, accessed 13 August 2025, https://www.skysports.com/tennis/news/32498/13230764/wimbledon-championships-all-england-club-to-replace-all-300-line-judges-after-147-years-with-electronic-system-next-year

[54] Mailard, S., 'How AI is revolutionising sports timing', europastar, May 2024, accessed 13 August 2025, https://www.europastar.com/the-watch-files/swatch-group/1004114384-how-ai-is-revolutionising-sports-timing.html

Case study: AI performance optimisation at SG Flensburg-Handewitt

In cooperation with Paderborn University, the German professional handball club SG Flensburg-Handewitt has developed the AI-powered system 'PIVOT' to optimise in-game performance and tactical decisions. The predictive system is built to measure the likelihood of a goal from a given situation on the field. The system was initially based on video recordings and data from 600 games, but as more games are monitored and fed into the system, its accuracy steadily improves. The model uses data from 180 metrics measured through sensors on the players, in the handball, and from video or other monitoring systems. The system makes use of some of the data already being created in the league and by systematically processing the data using an AI system.

After competitive games, the data are run through this comprehensive predictive AI model, which can help to determine how well certain in-game decisions performed, relative to what could have been achieved in the specific situation. If very few goals are achieved from situations which generally yield more goals, then the coaches and players can identify specific areas for improvement. This allows for a tailored evaluation of each game situation and for the players to practice the areas of their game where there is most room for improvement.

This tool is perceived to be a good supplement to the existing training methods at the club, and not something that removes the human element of the game, as the decisions in-game and the use of the data in practice are still left to the players and coaches.

5. AI's role in fan engagement

When fans experience sport, it is influenced by a range of different interactions which they have with the team or athlete, as well as the whole sport ecosystem around it. The experience is influenced by how a fan watches the sport, their in-stadium experiences, and how they follow commentary or news related to the sport. There is potential for integration of AI models into many of the interactions between clubs, athletes and fans, as everything from direct external communication to data analysis of fan behaviour can be supported by new AI systems.

The way sport is consumed is a mixture of new technological developments and traditional forms of entertainment. The traditional experience of a **live sport event** (e.g. in a stadium) has been complemented with the introduction of live replays on large screens and the provision of game statistics on personal devices during the game. Fans watching an event remotely can enjoy an increasingly immersive experience, enriched with tailored content and made more interactive with social media coverage. Similarly, AI will continue to shape traditional ways of engaging fans inside and outside of stadiums.

New AI systems can also improve **real-time engagement with fans** by clubs or sport organisations, both to keep consumers interested in the sport and to improve the relevance of marketing efforts. One tool, Machina Sports[55], offers continuous analysis of live sport statistics, insights and fan sentiment so that content strategies can be tailored in real-time. The tool can also generate personalised content that delivers high-quality real-time updates. Other features use AI-powered chatbots to answer questions and interact with fans, instantly delivering complex and personalised responses. A range of these AI systems is already being used in Formula 1 where the extensive data, monitoring and video recording can be curated for fans. The systems use AI-powered algorithms to select from across the data and propose highlights, racing data, onboard camera views, and insights from the driver based on the fan's past viewing history[56].

In sport stadiums, AI systems can help to create a safe and successful event for the fans and the organisers. In some stadiums in the United States, to avoid long queues to check tickets, fans upload a picture of their face and the barcode of their ticket to an AI-supported platform, which uses facial recognition AI software to match the person entering the stadium to the ticket holder[57]. Authorities have also started using AI for **crowd management**. Local German police tested the 'Escape Pro' AI software during the 2024 European football championship.

[55] Machina Sports, 'Boost Fan Engagement with Personalized AI', 26 September 2024, accessed 13 August 2025, https://machina.gg/blog/boost-fan-engagement-with-personalized-ai

[56] Mann-Bryans, M., 'How is artificial intelligence changing Formula 1?', Autosport, 1 October 2024, accessed 13 August 2025, https://www.autosport.com/f1/news/how-is-artificial-intelligence-changing-formula-1/10659532/

[57] Kottke, M., ' Digital support for fan experience: How artificial intelligence can help the sports industry', SportFive Magazine, 23 November 2022, accessed 13 August 2025, https://sportfive.com/beyond-the-match/insights/artificial-intelligence-digital-support-for-fan-experience

Escape Pro uses data from existing security cameras to calculate the number of people leaving or entering specific areas, to avoid overcrowding, emergencies, and support emergency evacuation planning[58].

Another area where AI is having a significant impact on sport events is in **ticket sales**, where AI tools are used to predict purchasing behaviour and implement dynamic pricing[59,60]. Professional clubs and organisations can increase their profit on ticket sales by using AI software to power micro-targeting. These systems can better predict exactly when they can get the highest price for a ticket from potential customers based on other data available about the event, prospective purchasers, and the sport ticket market. This use case highlights the ethical duality of AI usage, as it can generate more revenue for the commercial side of sport, and potentially attract more investment in the sport, but for fans it is likely to result in higher prices for tickets or merchandise.

As with AI in other fields, some proposed use cases are still theoretical, but in fan engagement, there are already promising products and technologies in active use. The more the sport sector gains and maintains the attention and engagement of fans, the more it can retain and attract new fans, which draws in new athletes and sustains sport over time as fans try out the sport themselves.

[58] George, N., 'Euro 2024: The Pinnacle of Technological Advancements in Football', Zone14, 10 July 2024, accessed 13 August, https://zone14.ai/en/blog/euro-2024-technology-in-football

[59] Westerbeek, H., *Algorithmic fandom: how generative AI is reshaping sports marketing, fan engagement, and the integrity of sport*. Front. Sports Act. Living 7:1597444., 2025, doi: https://doi.org/10.3389/fspor.2025.1597444

Case study: Real-time fan engagement and commentary at Wimbledon

A long-running cooperation between the major British tennis tournament Wimbledon and IBM has resulted in new digital solutions being continuously developed and deployed at Wimbledon. To remain at the forefront of digital innovation in sport and to improve fan engagement, several AI solutions have been introduced in recent years.

Live Match Chatbot: An interactive AI assistant has been created to answer questions from viewers during live matches. Fans can choose from pre-written prompts or simply ask natural language questions about the game they are watching or about Wimbledon in general. This allows them to quickly access relevant, up-to-date information without having to search across other platforms[61].

Real-time Commentary: By tracking the ball's movement, player positioning, and shot types, data are collected and fed into IBM's AI model which produces live natural language commentary. This model has been trained to use a language and tone specifically suited to tennis at Wimbledon[62].

Live Likelihood to Win: Using AI projections derived from moment-to-moment data, the system provides near-real-time estimates of each player's likelihood of winning after every point. This lets viewers watch the momentum of the match unfold and can make the game easier to follow.

[61] IBM, 'IBM at Wimbledon', accessed 13 August 2025, https://www.ibm.com/sports/wimbledon

[62] Milmo, D. and Hern, A., 'Wimbledon to introduce AI-powered commentary to coverage this year/', 21 June 2023, accessed 13 August 2025, https://www.theguardian.com/sport/2023/jun/21/wimbledon-introduce-ai-powered-commentary-to-coverage-this-year

6. Recommendations for SHARE 2.0 members on how to boost the adoption of AI

6.1 Strengthen AI adoption in grassroots clubs

Grassroots clubs often engage club personnel, athletes and their entourage in their activities. Friends and family of club volunteers and athletes may have experience with AI tools from their education or work. This experience can be used in the context of the specific sport and therefore be of value for local clubs. Reaching out and bringing these 'AI natives' into the adoption process can mitigate the lack of specific local digital expertise, spread the transformation efforts throughout the sport organisations, and help to educate those who use the tools on a daily basis.

- **Create local working groups across clubs and sports to implement AI solutions to harness expertise across generations and domains**[63]. These groups should be allowed significant flexibility to share experience and experiment with new AI tools on a small scale in order to determine which functions can be empowered with AI technology in grassroots clubs. While some financial or organisational resources should support these efforts, AI tools can often be trialled on a small scale without major investments.
- **Establish cooperation with AI solution providers to ensure data protection and transparency in products which federations recommend to clubs.** In doing so, the federations – which local grassroots clubs may be used to receiving advice from – can alleviate concerns about how AI models use data, or bias in the results from AI.
- **Introduce AI training programmes for volunteers and athletes from grassroots clubs.** These should promote ethical and explainable AI usage, train participants in both general use of AI and how to make best use of it within sports, including how to use prompts, creation and usage of AI agents in administration roles, data transfer, and safety practices.

6.2 Improve competitiveness in professional sports with AI

The market for AI tools is dominated by smaller companies and products and can be hard for professional athletes or sport clubs to navigate. To be able to best

[63] Engso Youth, *THREAT OR OPPORTUNITY? Impact of digital technologies on grassroots sport with the focus on Artificial Intelligence*, Position Paper, April 2022, https://engsoyouth.eu/wp-content/uploads/2022/05/6acfa9_aa27cf69778a45fc8264096270073ef0.pdf

guide the adoption of AI tools for their members, sport federations and cross-sport cooperations could seek expertise on which AI tools are available and useful in addressing the challenges that athletes and organisations face. This can alleviate common data or implementation concerns and ensure that clubs use tools suited for their context and specific sport.

- **Create centralised AI knowledge hubs** for administrative, training, and coaching support in sport federations or in cross-sport cooperations. The mission of these hubs should be to find the best ways to implement AI tools within the sport ecosystem of the federation or cross-sport cooperation, by drawing on technical and sport-specific expertise, and to provide access to resources for clubs to experiment with solutions on a trial basis. These can be organised between relevant sport organisations or with the help of national public authorities or relevant research centres.
- **Create a customised shared platform** powered by a large language model (LLM) that is trained on elite coaching insights specific to the sport. This can spread existing knowledge on techniques, fitness, and nutrition to grassroots clubs and practitioners, and help fill knowledge gaps within these areas locally.
- **Clubs should encourage and empower players with self-service AI tools**. This can be done by providing digital toolkits for teams or athletes to use and integrate simple AI-based tools such as skills feedback apps, performance trackers, goal and development dashboards into training cycles. As athletes have an interest in improving their performance, they could be encouraged to evaluate the benefits and drawbacks of the usage of these AI tools.

6.3 Boost fan engagement through AI experiences

To maintain relevance with their fans and keep them engaged, sports have had to continuously adapt to new technology. AI is the latest technological development in this regard, and it is crucial that sport clubs and federations make full use of the possibilities offered by AI tools to attract attention to their sports. Which AI tools each organisation can make use of depends on the needs and technical capabilities of each club.

- **Clubs should map fan engagement methods and assess the potential for AI use for each method.** Understanding how existing methods for fan engagement can be improved by integrating AI tools are a sensible first step for most clubs. Which AI tools are relevant depends on the size of the clubs and their existing infrastructure in areas such as stadiums, marketing, online social media presence, ticket sales, or broadcasting platforms. The aim should be to integrate AI across the entire fan journey.

- **Create public AI governance principles to explain AI usage by clubs to fans.** In cooperation with fan organisations, clubs should seek to develop AI fan policies which make clear when and how AI is used to curate the fan experience. This should assure fans that their data is not being used in any negative way and avoid the spread of misconceptions regarding the implications of AI adoption.

Annex 1: AI concepts

Large Language Models (LLMs)

Large language models are some of the most advanced and accessible natural language processing (NLP) solutions today. This type of AI model has been trained through deep learning algorithms to recognise, generate, translate, and/or summarise vast quantities of written human language and textual data. They can be used to not only assess existing text but also to generate original content based on user prompts[64]. Some examples of LLMs are Mistral, ChatGPT, Gemini or Claude.

Machine learning

Machine learning is a branch of AI focused on enabling computers and machines to imitate the way that humans learn, to perform tasks autonomously, and to improve their performance and accuracy through experience and exposure to more data. Through this the algorithm can perform tasks autonomously[65]. Classical machine learning is dependent on human input to determine categories in the data used to learn. Neural networks are a subcategory of machine learning.

Neural networks

A neural network is a type of machine learning model which makes decisions in a way similar to the functioning of a human brain. This is done by emulating the way biological neurons cooperate to identify phenomena, weigh different available options and draw conclusions. Each neural network has layers and nodes of artificial neurons which are connected to each other, and which can be activated if a certain threshold in a node above has been met[66].

Deep learning

As a part of the sub-field of machine learning below the more general category of neural networks, deep learning allows the use of unlabelled or unstructured data in raw form and can automatically recognise and distinguish between different categories of data. The need for human intervention to label data before incorporating it into the models is minimised, which allows for the use of large amounts of data[67].

[64] European Comission, 'What Is a Large Language Model?', 9 June 2023, accessed 13 August 2025, https://knowledge-centre-translation-interpretation.ec.europa.eu/en/news/what-large-language-model
[65] IBM, "What is machine learning?', accessed 13 August 2025, https://www.ibm.com/think/topics/machine-learning
[66] IBM, "What is a neural network?', accessed 13 August 2025, https://www.ibm.com/think/topics/neural-networks
[67] IBM, "What is machine learning?', accessed 13 August 2025, https://www.ibm.com/think/topics/machine-learning

AI agents

This is a type of autonomous software system which can interact with the environment to which it is connected by collecting and using data to perform self-determined tasks in order to meet predetermined goals set by humans[68]. This is characterised by the ability of the system to determine by itself, based on the data available, which tasks will be optimal to achieve the target it has been set. For this reason, it has more autonomy to solve the identified problems connected to its goal than other systems.

Prompts

This is the text inputted into a generative AI tool, such as Mistral or ChatGPT, to instruct the system on what to do and based upon which it generates a response. Prompts can be formulated as a question, a command or a longer statement which can include the context, specific instructions and preconditions which must be accounted for[69]. The specificity and detail of a prompt has a direct impact on the output that a given generative AI tool will produce. Prompt libraries can be found on the internet to help users to obtain better results.

Database

Any form of digitally organised collection of data for storing, managing and securing information systematically is a database[70]. In the context of AI in sport, the databases are the information which is either collected or generated to be used as input for the many kinds of AI systems.

Inference

Inference is the process that a trained AI model uses to draw conclusions from brand new data. It allows the AI system to detect similar patterns in a new context, even though it has not seen something exactly like that before in the training data[71]. For example, an AI model trained to recognise correct postures in the gym can suggest to an athlete to change the form of a given exercise to reduce the risk of injury, even though it has never seen that specific athlete perform that move before.

[68] Amazon Web Services, 'What are AI Agents?', accessed 13 August 2025, https://aws.amazon.com/what-is/ai-agents/
[69] Harvard University, 'Getting started with prompts for text-based Generative AI tools', 30 August 2023, accessed 13 August 2025, https://www.huit.harvard.edu/news/ai-prompts
[70] Kosinski, M., 'What is a database?', IBM, accessed 13 August 2025, https://www.ibm.com/think/topics/database
[71] Cloudflare, 'AI inference vs. training: What is AI inference?', accessed 13 August 2025, https://www.cloudflare.com/learning/ai/inference-vs-training/

Annex 2: How AI tools can help different sport users

AI tool / User	Unaffiliated amateur	Coach	Grassroots club	Professional club
LLMs	Training plan generation Meal planning Exercise form explanations Injury prevention tips Clarification of sport rules Motivation and goal-setting	Personalised training programme design Performance analysis reports Tactical strategy development Player communication templates and customisation Session planning and scheduling	Social media content creation Training session descriptions Event organisation planning Volunteer coordination messages Sponsorship proposal writing Basic legal document templates	Advanced tactical analysis reports Player development assessments Communications content Contract negotiation preparation Fan engagement strategies Scouting report generation
Wearables	Heart rate monitoring Step counting and distance tracking Sleep quality assessment Calorie burn estimation Basic fitness progress tracking Workout intensity monitoring	Real-time athlete monitoring Training load management Recovery tracking and optimisation Performance metric analysis Injury risk assessment Individualised training zones	Team fitness monitoring Basic performance tracking Training attendance verification Group workout coordination Member engagement tracking Equipment sharing optimisation	Advanced biometric monitoring GPS tracking and positional data Fatigue and stress monitoring Performance benchmarking Injury prevention analytics Return-to-play protocols
Virtual Reality Headsets	Immersive fitness experiences Sport skills tutorials Virtual training environments Technique visualisation Mental training and focus Gamified exercise routines	Tactical scenario simulation Technique refinement training Mental performance coaching Opponent analysis visualisation Skills development drills Pressure situation training	Youth engagement programmes Interactive training sessions Virtual competitions Skills assessment tools Team building activities Referee training simulations	Advanced tactical training Match situation rehearsal Injury rehabilitation programmes Mental conditioning protocols Fan experience enhancement Scouting and recruitment tools

Annex 3: Contributing organisations

The following organisations are part of the Steering Group of the Community of Practice on Innovation and actively contributed to this paper:

- European Aquatics
- European Platform for Sport Innovation (EPSI)
- Institute for Sport Governance, University of Warsaw
- Latvian Football Federation
- Sports + Vitality
- Sport Sciences School of Rio Maior - Polytechnic Institute of Santarém
- Sport Vlaanderen

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