International Journal of Trend in Scientific Research and Development (IJTSRD)
Volume 9 Issue 5, Sep-Oct 2025 Available Online: www.ijtsrd.com e-ISSN: 2456 – 6470

Wearable Technologies in Sports

Matthew N. O. Sadiku[1], Uwakwe C. Chukwu[2], Janet O. Sadiku[3]

[1]Roy G. Perry College of Engineering, Prairie View A&M University, Prairie View, TX, USA
[2]Department of Engineering Technology, South Carolina State University, Orangeburg, SC, USA
[3]Juliana King University, Houston, TX, USA

ABSTRACT

In recent years, wearable technology has significantly impacted the sports and performance. This technology is becoming indispensable for anyone looking to gain a competitive edge in the sports world. Wearable technologies have become increasingly popular in recent years, as athletes and coaches look for ways to gain a competitive edge. They have become a pivotal tool in sports, revolutionizing how athletes train, compete, and recover. Wearable technology in sports uses electronic devices to track athletes' physical activity, physiological responses, and biomechanical movements to improve performance, optimize training, and prevent injuries. These devices include GPS trackers, heart rate monitors, and motion sensors, among others. The purpose of this paper is to familiarize readers with the various uses of wearables in sports.

KEYWORDS: *wearables, wearable devices, wearable technologies, immersive technologies, sports, athletes, sensors, sports performance.*

How to cite this paper: Matthew N. O. Sadiku | Uwakwe C. Chukwu | Janet O. Sadiku "Wearable Technologies in Sports" Published in International Journal of Trend in Scientific Research and Development (ijtsrd), ISSN: 2456-6470, Volume-9 | Issue-5, October 2025, pp.872-882, URL: www.ijtsrd.com/papers/ijtsrd97606.pdf

IJTSRD97606

INTRODUCTION

Technology has allowed greater user-centered design solutions for various industries, including sports. It is progressively becoming inseparable from the realm of sports. The sports industry stands at the forefront of technological innovation, with wearable sports technology leading a data-driven revolution that is transforming how athletes train, compete, and recover. Wearable sports technology has evolved far beyond simple fitness tracking to become sophisticated performance optimization systems.

Wearable technology in sports refers to electronic devices that athletes wear to collect data on various aspects of their performance and physical condition. These devices collect data such as speed, heart rate, distance covered, and body load, providing insights used by athletes and coaches for real-time decision-making and long-term progress tracking. These advanced devices are changing how athletes train, compete, and recover, providing valuable insights that were once impossible to gather. Advances in technology have allowed individual endurance athletes, sports teams, and physicians to monitor player movements, workloads, and biometric markers in attempts to maximize performance and minimize injury.

The concept of wearable technology (WT) has transformed sports performance analysis by providing athletes, coaches, and sports scientists with real-time, data-driven insights into key physiological, biomechanical, and cognitive metrics. It has been used in various fields such as healthcare, education, sports, entertainment, electronics, textiles, and the defense industry for a long time. Over the past decade, smart wearable devices have revolutionized sports and exercise science, providing athletes, coaches, and scientists with unprecedented insights into performance metrics and physiological states [1]. Both professional and amateur athletes rely on wearable sensors to enhance training efficiency and competition outcomes. Sensors are the core of wearable technology. Without sensors, there is no use for wearables. WT is revolutionizing sports by providing real-time data for athletes to improve training, enabling coaches to tailor strategies, and providing insights for the sports industry. WT devices

have become indispensable assistants for coaches working to enhance sports performance [2].

WHAT IS WEARABLE TECHNOLOGY?

A wearable device is any device that is worn comfortably on the body and enables user interaction. It is typically integrated into the clothing or attached to the body of a person to enhance human performance. It often includes smart devices that can be worn on the body or attached to clothes. Wearable devices have been around for centuries. The first one was introduced in the 1660s by the Qing Dynasty. Since then the popularity of wearables has shifted from royalty to the healthcare industry. Wearable computing is a natural evolution of the smartphone technology that has become so ubiquitous and indispensable in education, business, and medicine. We wear wrist watches to know the time. Perhaps the most crucial bit of wearable tech accessible today is Google Glass. There has been a proliferation of wearables from consumer gadgets to medical devices that are approved by the Food and Drug Administration (FDA).

Wearable devices or systems are usually lightweight, miniature electronic or digital devices that are worn by a user, including clothing, watches, glasses, shoes, and similar items. A wearable computer is computer-powered device that is never-sleeping ever-present network-connected electronic system that can be used at anytime and anywhere and does not in any way disturb the user's interaction with the real world. It should be worn, much as eyeglasses or clothing are worn, and interact with the user [3]. It includes all manner of technology that is on or in the body such as fitness trackers, smartwatches, smart clothing, smart rings, smart glasses, wearable mobile sensors, smart jewelry, and smart ECG (electrocardiogram) monitors.

Wearables are always ready, unrestrictive, not monopolizing of user attention, observable and controllable by the user, attentive to the environment, useful as a communication tool, and personal devices [4]. Wearables are being used across healthcare, insurance, interactive systems, safety critical settings, wearable cameras, baby and pregnancy monitors, entertainment, fitness and sports, emergency responders, and military. Typical wearable devices are shown in Figure 1 [5]. Due to it wide range of applications, international corporations such Google, Apple, and Intel are investing heavily on wearable technology research and development [6]. As with any new technology, one must exercise caution when using a wearable device.

A wearable device essentially consists of two different components: wearable and body sensors. It incorporates sensors, memory, solar cells, and batteries. It stays in contact with the body for extended periods of time. Traditional materials for wearables are mostly metals and semiconductors with relatively poor mechanical flexibility. Modern wearable technologies are characterized by body-worn devices, as smart clothing, e-textiles, and accessories [7]. Wearable devices can be used to collect various data to support a series of innovative applications. Today, wearable devices have numerous applications due to their integration with artificial intelligence. Wearable devices can be attached to shoes, eyeglasses, earrings, clothing, gloves, and wrist watches [8].

WEARABLE TECHNOLOGY IN SPORTS

Sports can be categorized into several broad types, such as aquatic sports (e.g., swimming, water polo), ball sports (e.g., football, basketball, soccer, tennis), racquet sports (e.g., badminton, tennis, table tennis), combat sports (e.g., boxing, judo, wrestling), water sports (e.g., surfing, sailing), winter sports (e.g., skiing, ice skating), and team sports (e.g., baseball, cricket, rugby). Other categories include individual sports (e.g., gymnastics, athletics), motor sports (e.g., motorcycle racing), and extreme sports (e.g., skateboarding, sport climbing). Figure 2 shows the characteristics of sports wearable technology [9].

Wearable technology in sports encompasses a wide range of devices, each designed to capture specific data points that are crucial for enhancing athletic performance and improving training methodologies. From tracking vital signs to monitoring movement patterns, wearable technology is now an essential tool in sports coaching and athlete development. The primary purpose of wearable technology is to provide precise, real-time information that can help athletes and coaches enhance performance, improve training efficiency, and reduce injury risks. Advances in technology have allowed individual endurance athletes, sports teams, and physicians to monitor functional movements, workloads, and biometric markers to maximize performance and minimize injury.

Wearable technology in sports refers to electronic devices worn by athletes that collect and transmit data related to their physical activity, performance, and health. Typically, a wearable tech solution includes a device with a sensor, a cloud, and a user-facing app. The general purpose of wearable technology is to produce data and analyze it while the wearer is performing some kind of action, be it working, jogging, or sleeping. Figure 3 shows a tattooed sportsman with headphones running and listening to music [10].

Wearable technology in sports can be integrated into different training methods to optimize intensity, recovery, and players' technique. Athletes use wearables to monitor training intensity, recovery, athletic performance, and other health-related data. Sports scientists also use motion sensors to study movement patterns, giving teams valuable data to improve performance and reduce injury risks. Sports organizations invest in emerging technologies to stay competitive in the global sports industry.

WEARABLE DEVICES IN SPORTS

The four main categories of wearable technologies are smartwatches, smart clothing, smart glasses, and smart jewelry. Common types of wearable devices used in sports include the following [11]:

- *GPS Trackers:* Global positioning satellite (GPS) has been used to monitor the speed and position of athletes in football, orienteering, cross-country skiing, and field hockey. It has also been used to modify training regimens to improve athlete performance. GPS trackers are widely used in professional sports to monitor athletes' movements on the field. They measure the speed at which an athlete moves and the total distance covered during training sessions and matches. These metrics are crucial for understanding an athlete's stamina, pacing, and overall endurance. GPS devices require signal transmission from multiple GPS satellites orbiting the earth.
- *Heart Rate Monitors:* These are essential for tracking an athlete's cardiovascular performance. These devices measure heart rate in real-time, providing insights into an athlete's exertion levels and recovery rates. They track the athlete's heart rate throughout training and competition. This data helps in assessing cardiovascular fitness, determining exertion levels, and monitoring recovery rates.
- *Motion Sensors:* Motion sensors are used to track an athlete's movements, including acceleration, deceleration, and changes in direction. These devices help in understanding an athlete's agility and responsiveness.
- *Accelerometers:* They measure the rate of change in velocity, providing data on how quickly an athlete can speed up or slow down. This information is particularly useful in sports like football, basketball, and rugby, where explosive speed and quick changes in direction are essential. Accelerometers and motion sensors measure how quickly an athlete can speed up or slow down. Accelerometers and gyroscopes have demonstrated promise in the realm of personal fitness by giving the user access to advanced performance data and the ability to quantifiably alter exercise programs. An additional benefit of accelerometers is the ability to estimate energy expenditure by integrating vertical acceleration over time
- *Wearable Cameras:* Wearable cameras, such as those mounted on helmets or uniforms, provide a first-person perspective of an athlete's performance. These cameras are particularly useful in sports like American football and ice hockey.
- *Smartwatches and Fitness Bands:* These are versatile wearables that track a wide range of metrics, including heart rate, steps taken, calories burned, and sleep patterns. While these devices are often used by amateur athletes, they also provide valuable data for professional training regimens.

Each type of device gives coaches and athletes unique insights that shape how they train and compete. They are all designed to monitor and improve athlete performance, health, and safety. Smart clothing, ingestible and tattooable devices, smart rings, smart glasses, and virtual reality headsets are examples of devices that do not fit neatly into any of the above categories.

APPLICATIONS OF WEARABLE TECHNOLOGY IN SPORTS

Wearable performance devices and sensors are becoming more readily available to the general population and athletic teams. Wearable technology has been extensively studied in relation to improving sports performance. The potential of wearable technology is huge. Here are some ways wearable technology is integrated into professional sports [11]:

- *Soccer:* Professional soccer/football has embraced wearable technology as a tactical necessity. In football, wearable technology is commonly used to monitor player movements, heart rates, and overall workload during training sessions and matches. It helps coaches tailor training programs to individual needs and manage player fatigue effectively. Sensors in shoulder pads track speed and distance, with data shared to analyze player and team performance. Performance wearables can track heart rate, distance traveled, metabolic power, acceleration, and sprints, which can help soccer players to improve their conditioning, efficiency, and speed. In soccer, GPS trackers measure distance covered, sprint counts, and tactical positioning. Coaches use this data to analyze formation strategies and pressing

intensity. For example, football clubs use GPS trackers to monitor players' running patterns and adjust their positions to optimize team performance. Figure 4 shows some soccer players [11].

- *American Football:* In American football, wearables are used to track metrics such as impact forces, speed, and positional data. These devices help coaches analyze player performance and make strategic adjustments. Wearable sensors have been used in American football to monitor concussions by measuring linear and angular head accelerations upon impact. For example, football players can use GPS data to refine their running patterns and enhance their efficiency on the field. In American football, sensors integrated into helmets and mouthguards have detected over 95% of impacts, which is crucial for monitoring and preventing concussions. American football is known to have sensors embedded into their helmets, which monitors the status of head injuries (concussion). Figure 5 shows American football players [11].
- *Ice Hockey:* Wearable technology in ice hockey includes devices that track skating speed, distance, and heart rate. Wearables track skating speed, distance, and heart rate. These metrics help coaches evaluate player conditioning and performance. They are crucial for evaluating player stamina and performance on the ice. Figure 6 shows some ice hockley players [11].
- *Basketball:* In basketball, wearables are used to monitor players' movements, jumps, and physical exertion. Basketball players use accelerometers and motion sensors to track jump counts, acceleration patterns, and fatigue levels. Motion sensors are used to track every move, effort, and required rest period for players. Studies on baseball have shown that wearable sensors can accurately measure elbow torque and shoulder movement, providing data essential for injury prevention. Figure 7 shows some basketball players [11].
- *Rugby:* Rugby players use wearables to measure various performance indicators, including speed, distance, and the intensity of physical collisions. These devices provide valuable data that coaches use to assess player conditioning, optimize training sessions, and reduce the risk of injuries. Figure 8 shows rugby players using wearable technology [11].
- *Swimming:* Swimming is unique because athletes train in water. Wearable tech can be used in swimming to monitor and improve swimmers' performance by providing feedback on posture, motion, speed, heart rate, and other physiological parameters. Swimming presents unique challenges for wearable technology, but innovations include waterproof biometric monitoring. Coaches use data to analyze efficiency and drag profiles, helping swimmers optimize performance in competition.

BENEFITS

Wearable technology offers many benefits for athletes across various sports. The primary benefit of wearable technology in sports is its ability to enhance athlete performance. A major benefit of wearable tech is that it can track performance metrics and give a clear picture of an athlete's workload, recovery, and skills. Athletes across various sports benefit significantly from cutting-edge wearables. These devices provide detailed insights that help in fine-tuning performance, optimizing recovery, and preventing injuries. Other benefits include the following [1,11]:

- *Improved Performance*: The performance of an athlete depends on their technical, tactical, physiological, and psychological/social characteristics. Wearable devices such as GPS trackers and heart rate monitors provide comprehensive data on speed, distance, heart rate, and movement patterns. Analyzing this data allows athletes to pinpoint areas for improvement, optimize their training routines, and ultimately boost their performance. Wearable technology has transformed the way athletes and coaches approach training and performance analysis by providing a wealth of precise, real-time data.
- *Enhanced Coaching:* If you are a coach, you can utilize wearable tech to come up with most advanced training programs and become a top level professional. Coaches gain invaluable insights from wearable technology, enabling more informed decision-making regarding training intensity, player positioning, and game strategies. Real-time data on an athlete's physical condition and performance metrics helps coaches design individualized training programs, resulting in more effective coaching and better athletic outcomes. Wearable sensors provide physicians, coaches, and training staff with a method of monitoring real-time physiologic and movement parameters during training and competitive sports. Wearable technologies can be used to track training intensity, which can help athletes train at the right level and avoid overtraining

- *Informed Decision:* By collecting and analyzing real-time data, coaches and athletes can make informed decisions to improve training regimens, optimize performance, and reduce injury risks. Real-time data on performance indicators helps coaches and athletes tailor training programs and make informed decisions.
- *Reduced Injury:* There are many factors that contribute to whether an athlete is injured, from how stressed they are, both physically and mentally, to the strength, or lack of strength. One of the most significant benefits of wearable technology is its potential to lower injury risks. Wearable technology provides the data necessary to improve performance, enhance coaching, and reduce injury risks, leading to safer and more successful athletic experiences. Devices like heart rate monitors and motion sensors can detect early signs of overtraining, fatigue, and potential injuries. By monitoring workload, biomechanics, and recovery status, wearables can help identify potential issues before they lead to injury. Sleep and recovery are the biggest factors that impact an athlete's performance. Wearable technologies can be used to track sleep quality and other factors that affect recovery.
- *Personalization:* The move towards personalized training programs is crucial for addressing individual athlete needs, and promoting healthier, longer careers. The future prospects of WT within the realm of sports exhibit substantial potential due to advancements in personalization, heightened data density, and the seamless integration of novel sensors. Wearable tech allows for personalized training by gathering individual data that helps coaches tailor training based on biomechanics, fitness, and injury risks. This personalization improves performance by addressing the specific needs of each athlete.

Some benefits of wearables in sports are displayed in Figure 9 [12].

CHALLENGES

In spite of the unprecedented insight wearable technologies provide into athletic performance, they also bring challenges related to data accuracy, interpretation, and ethical considerations. Challenges such as data privacy concerns, accuracy limitations, high costs, and ethical considerations remain significant barriers. Men's sports are funded at twice the rate compared to women's sports, and that financial inequity means there is a lack of resources and technology that can be used for monitoring. Other challenges include the following [2,13,14]:

- *Cost:* Wearable devices are expensive, creating accessibility issues for youth teams, smaller clubs, and developing sports. High-quality wearable devices can be expensive, limiting their accessibility to amateur athletes or teams with limited budgets. Potential solutions include reducing production costs through technological advancements and economies of scale, and developing lower-cost alternatives that still provide valuable insights. As the technology gets better, costs will come down.
- *Privacy Concerns:* Continuous monitoring of physiological data raises concerns about data privacy and the ethical use of the collected information. Establishing robust data protection regulations and ensuring transparency in data usage policies are essential steps in addressing these concerns. Performance data from wearables is personal data. Who owns it, and how should it be used? Athletes will worry about their data being shared without consent, while sports organizations need to have clear policies in place to protect privacy.
- *Ethical Concerns:* Concurrent with the adoption of wearable technologies in sports, ethical considerations assume paramount importance. Ethical principles governing the collection, use, and dissemination of personal data should be meticulously observed to safeguard athletes' privacy, autonomy, and rights.
- *Data Security:* With the increasing sophistication of wearable technology comes greater responsibility for data protection. The deployment of wearable technologies introduces security vulnerabilities concerning users' health and performance data. Unauthorized access, data manipulation, or data loss could compromise data protection, thereby endangering the accuracy, integrity, and confidentiality of the information. Athletes and organizations must consider biometric data encryption standards.
- *Validity:* The accuracy of wearable devices in measuring specific metrics can vary significantly. A potential solution is to develop advanced algorithms that can better interpret data under varying conditions and integrate multi-sensor data to enhance accuracy.
- *Reliability:* Not all devices are created equal, and accuracy can vary greatly. If wearable sensors produce bad data, coaches will make poor decisions based on flawed information. The reliability of data from wearable devices can be influenced by environmental factors and device

placement. GPS accuracy can be compromised in urban areas with tall buildings. Improving sensor technology and incorporating redundant systems can help mitigate these issues.

- *Interpretability:* Wearable devices generate vast amounts of data, which can be challenging to interpret effectively. Athletes and coaches may struggle to make actionable decisions based on complex datasets.
- *Information Overload:* Wearables generate a ton of performance data. Without proper frameworks to interpret the data, coaches and athletes will be overwhelmed. The challenge is to filter out the noise and focus on the actionable insights that actually improve performance.
- *Overreliance:* There is the risk of overreliance on technology. While wearables provide great data, they should complement – not replace – coaching intuition and an athlete's self-awareness. Balancing human expertise with technological insights is key to long-term success.
- *Regulation:* The integration of wearable technologies in sports engenders legal and regulatory complexities. Adherence to various legal regulations is imperative throughout the processes of data collection, processing, and sharing, particularly when handling sensitive information such as health data. Federal regulations do not address the use of biometric technologies in sports. Professional athletes are considered employees, but student-athletes in collegiate sports have no protection from federal and state employment regulations.
- *Battery:* The source of power for wearables comes from batteries. Common types of wearable batteries are alkaline, Nickel metal hybrids, and lithium ion. The size of the battery will affect the size of the sensor used. Evolving battery technologies has helped wearables become the desired consumer items they are today. While designing, it is crucial that the battery can be recharged with minimal changes to the wearable itself. This is because it should not need to be unassembled and must have a way to remove the battery without taking the wearable apart too much.

FUTURE OF WEARABLE TECHNOLOGY IN SPORTS

Wearable devices have become a game-changer across various sports, offering detailed insights that drive better performance and safer training environments. They are valuable instruments for the improvement of sports performance. Wearable tech has become increasingly popular on the field and in the gym in recent years. It has dramatically transformed the sports world, revolutionizing training, performance analysis, and injury prevention. Wearable devices are now part of the daily routines of athletes worldwide.

The future of wearable technology in sports hinges on developing more accurate, sport-specific devices and integrating advanced data analytics and artificial intelligence. Wearable technologies are expected to continue evolving, driven by advancements in sensor technology, data analytics, and artificial intelligence. Key trends include the miniaturization of sensors, integration of multi-sensor platforms, and the use of machine learning algorithms for data interpretation. Sensors and wearable technology will continue to evolve, and future developments may include more sophisticated sensors, greater interoperability between devices and platforms, and AI integration for predictive analytics.

Next-generation wearables refer to highly advanced, often artificial intelligence (AI)-driven, digital devices that athletes wear to monitor, analyze, and optimize their performance. Artificial intelligence will play a crucial role in improving the accuracy and interpretability of data from wearable devices. It will enable predictive analytics for injury prevention, automated play-calling and personalized training. Coaches will make faster and better decisions. The integration of artificial intelligence (AI) and wearable technology will revolutionize the sports landscape, providing real-time data acquisition during training sessions and competitions. AI-powered coaching systems have the potential to revolutionize the way athletes receive guidance and feedback. Wearable devices integrated with VR and AR systems will revolutionize training methodologies [13]. Future wearables will be smaller, lighter, and more integrated into athletic gear. Ultimately, the future of wearable technology in sports is about balance, using data to improve performance while keeping athletes healthy, motivated, and focused on the game [14].

CONCLUSION

Although we are still at an exploratory phase of using wearable technology in sports, wearable devices have gained significant popularity due to their accessibility, affordability, and non-prescription nature. They are transforming the sports industry by providing athletes and coaches with valuable data to improve performance, enhance coaching strategies, and reduce injury risks. They have become an integral part of professional sports leagues around the world.

Wearable technology in sports is now a major factor in how athletes prepare, perform and recover. It

includes electronic devices athletes can wear to collect, analyze and share data about their physical activity, physiological responses and biomechanical movements. By leveraging wearable technology, professional sports leagues and elite athletes can achieve new heights of excellence and maintain a competitive edge in their respective fields. The future of sports lies in the seamless integration of technology and human potential. More information about wearable technology in sports can be found in the books in [15-20].

REFERENCES

[1] S. A. Singh, A. J. Singh, and L. S. Devi, "Revolutionizing sports: The impact of next-generation wearable technology," January-April 2025, https://journals.lww.com/jmso/fulltext/2025/01000/revolutionizing_sports__the_impact_of.3.aspx

[2] A. C. Seçkin, B. Ateş, and M. Seçkin, "Review on wearable technology in sports: Concepts, challenges and opportunities," *Applied Sciences,* vol. 13, no. 18, September 2023.

[3] M. N. O. Sadiku, S. Alam, and S. M. Musa, "Wearable computing," *International Journal of Engineering Researc*h, vol. 6, no. 10, Oct. 2017, pp. 445-447.

[4] M. Kaiiali, "Designing a VM-level vertical scalability service in current cloud platforms: a new hope for wearable computers," *Turkish Journal of Electrical Engineering & Computer Sciences*, vol. 25, 2017, pp. 2555 – 2566.

[5] https://www.researchgate.net/figure/Different-types-of-wearable-technology_fig5_322261039

[6] M. Salahuddin and L. Romeo, "Wearable technology: Are product developers meeting consumer's needs*?" International Journal of Fashion Design, Technology and Education*, vol. 13, no. 1,2020, pp. 58-67.

[7] M. N. O. Sadiku, P. O. Adebo, A. Ajayi-Majebi, and S.M. Musa, "Wearable healthcare technologies," *International Journal of Trend in Research and Development*, vol. 7, no. 3, May-June 2020, pp. 94-97.

[8] M. N. O. Sadiku, O. D. Olaleye, A. Ajayi-Majebi, and S. M. Musa, "Wearable AI: A primer," *International Journal of Trend in Research and Development,* vol. 8, no. 1, Jan.-Feb. 2021, pp. 35-38.

[9] P. Jain, "Sensors drive better safety and performance," September 2024, https://www.cas.org/resources/cas-insights/better-safety-better-performance-how-sensors-change-the-game

[10] "Key types of wearable sports technology in 2025," https://www.folio3.ai/blog/wearable-sports-technology/

[11] "Wearable technology in sports," June 2024, https://www.catapult.com/blog/wearable-technology-in-sports

[12] "How wearable technology is changing the sports industry," March 2023, https://www.cogniteq.com/blog/how-wearable-technology-changing-sports-industry

[13] G. M. Migliaccio, J. Padulo, and L. Russo, "The impact of wearable technologies on marginal gains in sports performance: An integrative overview on advances in sports, exercise, and health," *Applied Sciences,* vol. 14, no. 15, July 2024.

[14] "Wearable technology in sports: A detailed guide for coaches & teams," August 2025, https://gorout.com/wearable-technology-in-sports/

[15] D. A. James and N. Petrone, *Sensors and Wearable Technologies in Sport: Technologies, Trends and Approaches for Implementation.* Springer, 2016.

[16] J. Toner, *Wearable Technology in Elite Sport: A Critical Examination.* Taylor and Francis, 2023.

[17] M. R. Dhinu, *Modern Technologies In: Physical Education And Sports Sciences.* Friends Publications (India), undated.

[18] M. Zieglmeier, *The Potential of Wearable Technology in Amateur Football: A Qualitative Study.* Anchor Academic Publishing, 2017.

[19] D. Memmert (ed.), *Sports Technology: Technologies, Fields of Application, Sports Equipment and Materials for Sport*. Springer, 2024.

[20] J. Lee, K. Wheeler, and D. A. James, *Wearable Sensors in Sport: A Practical Guide to Usage and Implementation.* Springer, 2019.

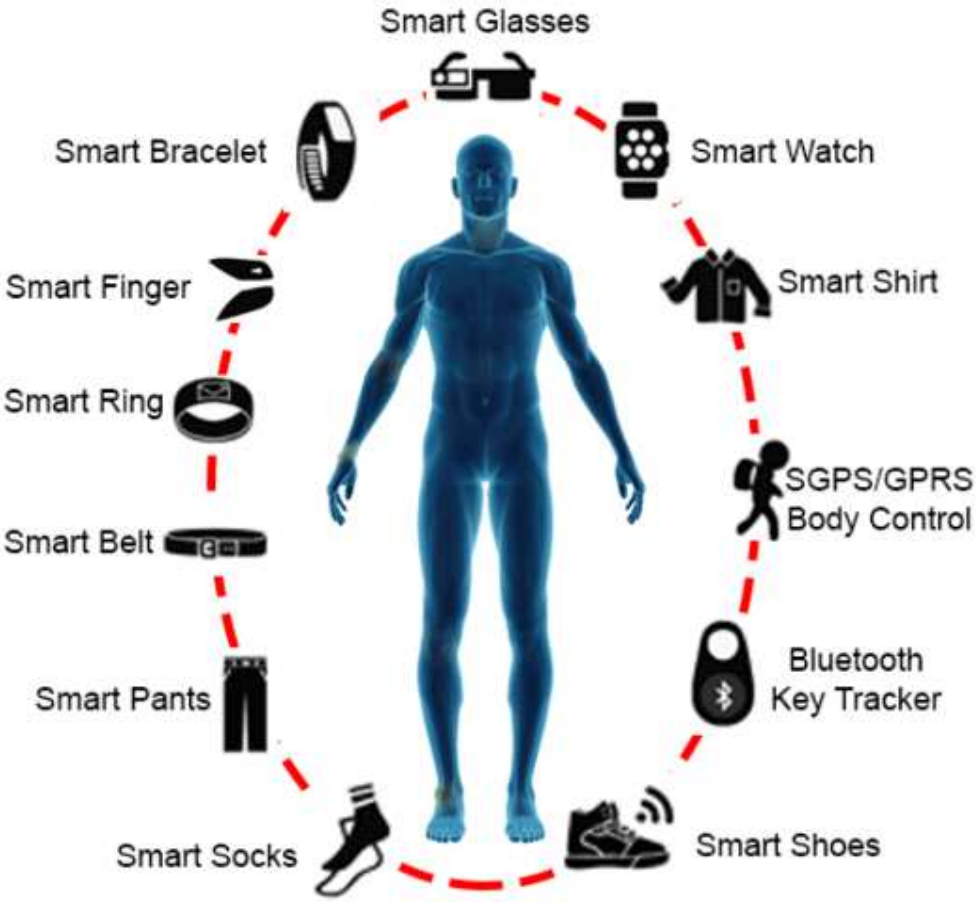

Figure 1 Different types of wearables on human body [5].

Figure 2 Characteristics of sports wearable technology [9].

Figure 3 A sportsman with headphones running and listening to music [10].

Figure 4 Soccer players [11].

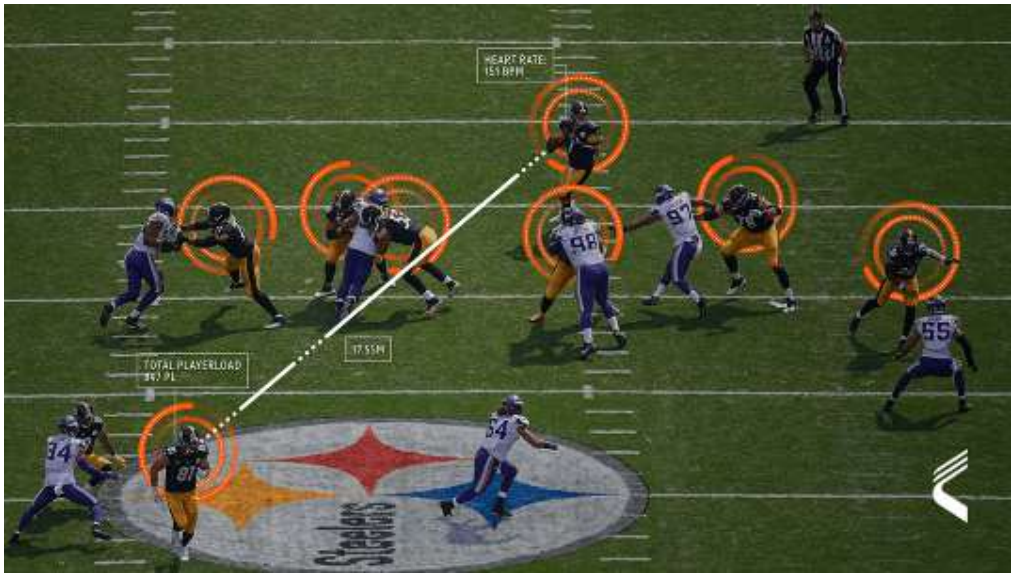

Figure 5 American football players [11].

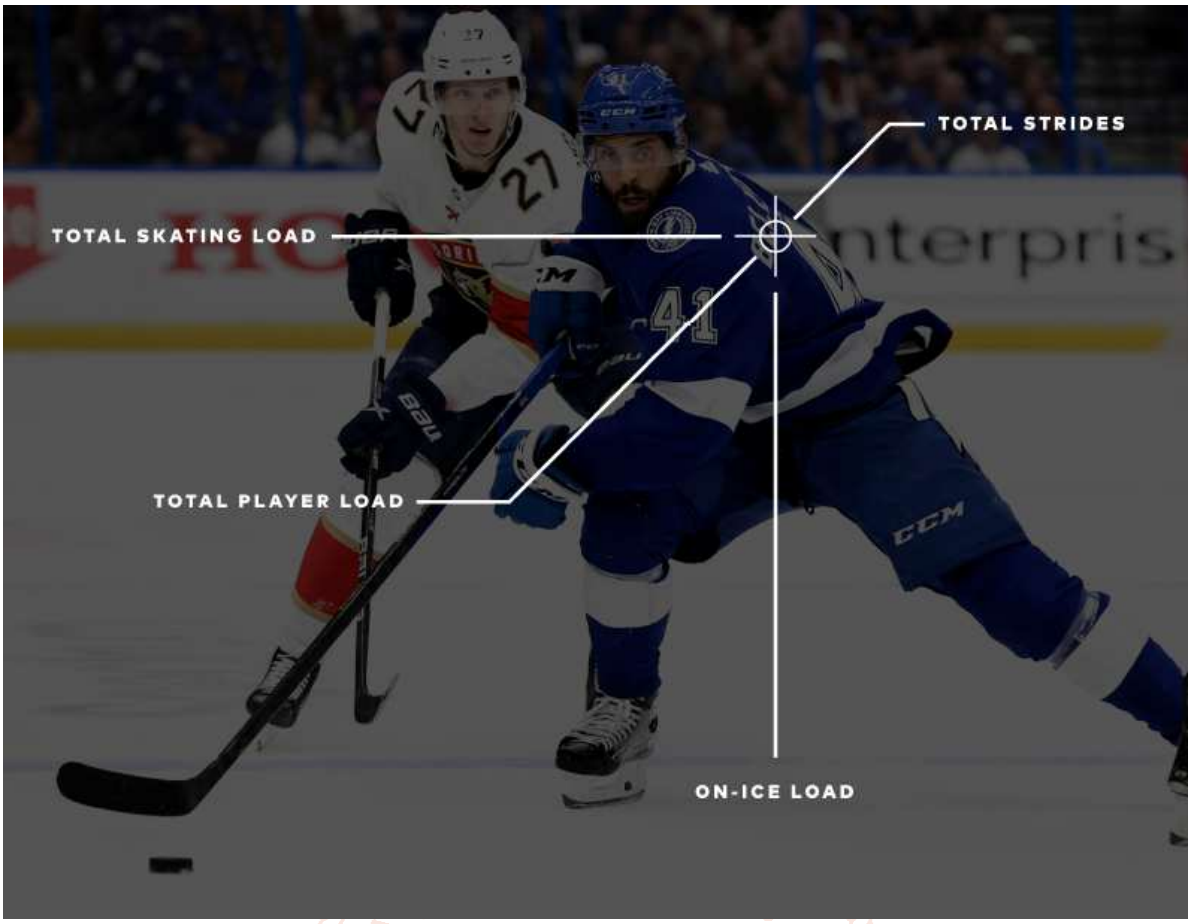

Figure 6 Some ice hockley players [11].

Figure 7 Basketball players [11].

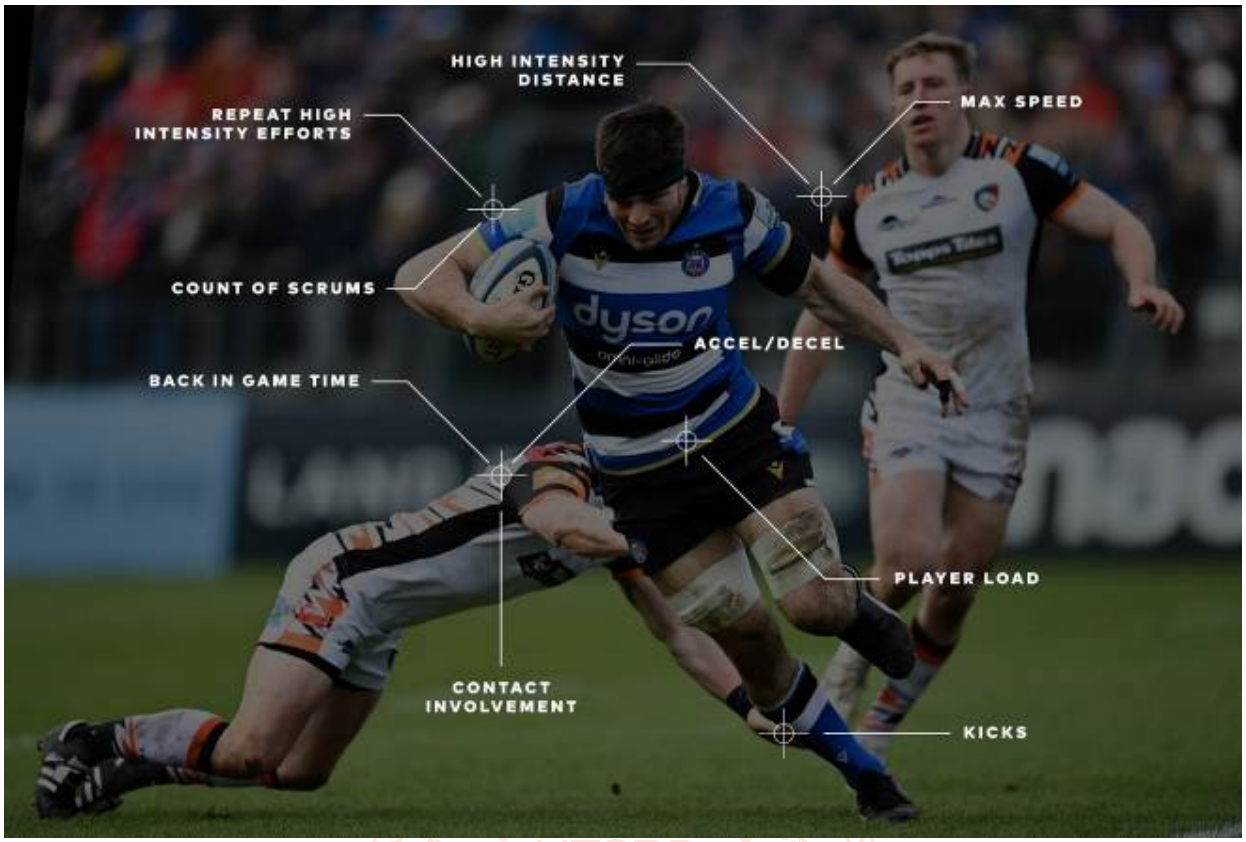

Figure 8 Rugby players using wearable technology [11].

Figure 9 Some benefits of wearables in sports [12].