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Improving Team Performance via Digital Technology Adoption

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Abstract

In an era characterized by rapid advancements in digital technology, its integration across various industries to enhance user experiences and streamline operations has become ubiquitous. Notably, athletes are also reaping the benefits of digital technologies that monitor and amplify their performances. This paper delves into the domain of the National Basketball Association (NBA), a trailblazer in leveraging digital tools to refine player skills and team efficacy. Focusing on the Golden State Warriors (GSW), the study scrutinizes their adoption of cutting-edge digital technologies, such as Sports VU, Catapult, and Dashboard, for player development. While GSW's progressive initiatives have yielded favorable outcomes, the essay advocates for the incorporation of additional tools like 3D Athlete Tracking to glean insightful statistics and ShotTracker to enhance shooting precision. This analysis underscores the potent potential of digital technology in honing athlete capabilities and fostering overall team success.

Keywords: digital technology, athlete development, Golden State Warriors, performance enhancement, 3D athlete tracking, ShotTracker

1. Introduction

As digital technology advances, it is being employed in a variety of industries to improve user experience and transform business operations (Deloitte, 2020). Athletes are also being trained using digital technologies which monitor and enhance their performances (Liebermann et al., 2002). As the world's best basketball league, the NBA already has numerous teams that use digital technology in team training to improve player skills and team performance (Rathborn, 2020; Obbie, 2021). Paper will analyse how Golden State Warriors (GSW) uses digital technology and other existing state-of-the-art digital tools to enhance player development. It will also make recommendations to Warriors on adopting more digital technology.

2. An Overview of the Digital Technologies Utilised Currently

GSW employs some digital technologies for player improvement, especially in the area of player development. The NBA sees athlete health and fitness as a crucial area of growth, and player monitoring is a key tool for tracking this data. Teams can successfully monitor and

manage player health and performance by utilising a tracking system (Portch, 2019).

2.1 SportVU

GSW firstly used digital technology in team training in 2010, and it was the first team in the NBA to install SportVU to view and analyse every dribble and pass a player makes (Beardsley et al., 2017), as well as the player's speed, the distance between teammates, and the miles run throughout a game (Stats Perform, 2019). In 2013, the Warriors began to experience an increase in their numbers after learning how to exploit this data. Their winning percentage climbed from 57% in 2013 to 89% in 2016 (Collins, 2016). It demonstrates how coaches can better understand each player's weaknesses and strengths and build plans based on this information.

2.2 Catapult

GSW started employing Catapult in 2015 (Berger, 2015), where players wear small monitors from Catapult Sports that can track their movements during practise, monitor pressure on their knees and ankles and determine if they are moving at their usual healthy level. It allows real-time monitoring of acceleration, directional changes, heart rate, and the forces exerted on the knees and ankles by measuring minute motions simultaneously (Catapult, 2021). Coaches can use Catapult's data instead of their senses to determine exactly where an athlete is in terms of loading. It can assist coaches in better sequencing players and their playing time to maximise wins while minimising player injuries. In 2015, it also assisted the Warriors in winning the championship.

2.3 Player Dashboard

The GSW and Oracle announced the debut of the Warriors Player Dashboard in 2021 by the Warriors, which would aggregate and compare near real-time data to better the team's player development (NBA, 2021). Players who generally practise bottom corner threes but shoot from the top of the goal in games can benefit from the dashboard, which will help them comprehend inconsistencies between players in practice and games. This data can assist players and coaches in fine-tuning their strategies to win more games. The performance of the Warriors in the new season has been better than that in the last season, and they have entered the finals for the first time since 2019 (Ganguli & Cacciola, 2022).

3. Overview of the State-of-the-Art Technologies

Despite being the first team in the NBA to use technology to boost player performance and continue to update it, the Golden State Warriors are still missing out on some state-of-the-art technologies.

3.1 3D Athlete Tracking Technology

3D Athlete Technology (3DAT) is the first AI-powered 3D athlete tracking technology created in collaboration with Intel and Alibaba (Alizila, 2019). It blends computer vision with AI deep learning algorithms to build a 3D grid that allows coaches and trainers to extract complex real-time biomechanical data from multiple standard cameras without the need for athletes to wear special sensors or suits (Intel®, 2022). Intel® 3DAT extracts whole-body skeletal and object key points by using a proprietary deep learning algorithm, then extrapolates 3D motion from a single camera by estimating the depth of each skeletal point. At the Tokyo Olympics, this technology has already been employed in athletics (Faisal, 2021). Coaches will be able to analyse athletes' movements and make more targeted alterations to increase performance with the data acquired, which is far more visible than digital data or 2D footage.

3.2 ShotTracker

ShotTracker is a sensor-based system that collects statistics and analyses the performance of the entire team in real-time (ShotTracker, 2022). The Phoenix Suns of the NBA is now using this technology to analyse player data (Newcomb, 2020). ShotTracker records everything, including who has possession of the ball, whether the ball is in or missed, and who gets a rebound or an assist. Coaches and players can access the data and analysis reports created in real-time via the app. With this data, coaches can develop offenses to take advantage of players to make efficient decisions (Stephen, 2018). Players may now access their data via the app at any moment, making it easy to check their objective data. Players can make changes now that they have a better understanding of their performance.

3.3 Sleeping Tracker

Emfit QS is a non-wearable all-night sleep tracker that collects and analyses sleep metrics to recommend relevant measures to improve sleep quality (EMFIT, 2021). It is unique in that it

features technology that monitors heart rate variability (HRV) throughout the night, and the high and low fluctuations in HRV can be utilised to evaluate if overtraining is occurring and the level of recovery of the athlete's body (Aubert et al., 2003). Overtraining is a severe problem, particularly for professional athletes. Human intuition is not very reliable in determining the ideal training intensity, but heart rate variability data (HRV) can be. With this knowledge, athletes may adjust the intensity of their training to meet their bodies' true needs, avoiding overtraining and pushing themselves to their limitations. Furthermore, sleep deprivation might raise the risk of injury in athletes, lowering movement accuracy and speed. It can also cause slower reaction times and poor decision-making (Science, 2015). Sleep monitoring allows athletes to examine the quality of their sleep to reduce the risk of injury.

4. Recommendations

According to the above discussion, they still do not utilise any state-of-the-art technologies. As a result, GSW must implement new digital technologies to improve the performance of their players.

4.1 3D Athlete Tracking Technology

Traditional video displays lack binocular depth signals while 3D video displays integrate them to produce a more realistic representation of content (Miles et al., 2012). For that reason, 3DAT can provide a more detailed and visual image and information than regular video. Additionally, the technology employs artificial intelligence to model three-dimensional human movement (Intel®, 2022). Purdue players are learning how to modify their posture and technique to become faster, as well as more efficient runners by receiving feedback from the 3DAT system (Ching, 2022). GSW currently does not utilise any tracking technology capable of rendering an athlete's movements in 3D space. Therefore, GSW could use this technology to model players and analyse their motions, enabling trainers to adjust their shooting and dribbling techniques. This can help the player's shooting movement, which in turn can enhance the player's shooting percentage and performance.

4.2 ShotTracker

In basketball games, one of the most crucial criteria in winning is the accuracy and shooting percentage of the players' shots. Therefore, data analysis focusing on shots is quite essential. Secondly, the ShotTracker has its specialised software that not only allows coaches to examine real-time player statistics, but also generates an automatic analysis of the best line-ups, player comparisons, and so on. It boosts the convenience because players may use the app to view and change their data at any time and from any location. In addition, ShotTracker has partnered with Catapult, which is being used by the Warriors in 2019, to combine their data tracking capabilities for college and professional basketball teams (Catapult, 2019). Heishman et al. (2020) used a combination of these two technologies for basketball training. Using this technology will enable Warriors coaches and players to view their shooting data more swiftly and conveniently, thus making timely adjustments to improve their shooting quality and improve player performance in the meantime.

5. Conclusion

paper examined how GSW uses digital technology and other existing state-of-the-art digital technology to improve player development. It makes suggestions for GSW based on existing technologies. Since 2010, GSW has steadily implemented Sports VU, Catapult, and Dashboard into their training to enhance player development, and their results have continued to improve. At this time, other technologies in the sports sector, such as 3D athlete tracking, ShotTracker, and Sleeping Tracking, are not used by GSW. I would advise GSW to implement 3D Athlete Tracking to visualise stats and Shot tracker technology to enhance shooting quality.

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