The Role of Data Analytics in Professional Sports Management

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On my honor as a University Student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments

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The 69-billion-dollar market for professional sports in the United States attracts investors. In moneyball, a term popularized by the 2011 movie of the same name, sports executives apply data analytics to maximize return on investment. Team executives and owners have increasingly looked towards data analytics to improve their chances of success by recruiting undervalued players and making in-game decisions that maximize the likelihood of winning. The Oakland Athletics, often referred to as the “A’s” by fans, have been an organization in Major League Baseball since 1901. In 2002, the A’s were on their fourth straight season without a postseason appearance when general manager Billy Beane began implementing an innovative new style of management which would go on to completely change the landscape of professional sports. In order to understand Billy Beane's innovative thinking, it’s important to understand the landscape of general managing and scouting in the MLB at the time. As anyone who’s watched an MLB broadcast knows, baseball is a game with many statistics and it has been this way for a long time. General statistics such as batting average (the number of hits recorded by the batter divided by total at bats excluding walks and sacrifices) and earned run average (the number of earned runs allowed * 9 divided by the number of innings pitched) have long been used by managers to compare players and make playing decisions. Billy Beane's innovative idea was that more advanced metrics, referred to as sabermetrics, could better gauge a player's value. Instead of the more common batting average, Beane gave more value to a player’s on base percentage. While some managers might give less value to a player who draws walks over one who hits singles to get on first base, Beane didn’t care how players were getting on base as long as it was contributing to team success. Another important metric that Beane used to evaluate players was wins above replacement (WAR). This metric compares a player's output to the performance of a replacement-level player in the form of wins over a season. Beane obsessed over statistics such

as this one which lead him to fill his roster with players who statistically should contribute a large number of wins to the team, even if they didn't seem as valuable based on the more commonly observed stat of batting average.

It is often said that challenges force adaptation, and the challenge faced by Beane that forced him to rethink player analysis was that he was building a team with one of the lowest payrolls in the MLB. Franchises in Major League Baseball bring in and spend vastly different amounts of money on their players, often contributing to the repeated success of certain franchises. The Oakland Athletics were one of the teams who had previously struggled to find success against the star studded rosters of teams with a payroll greater than double theirs. By leveraging market inefficiencies on players who were overlooked for a variety reasons such as age, attitude, or not fitting a traditional skillset, Beane was able to assemble a team that won 103 games and the American League West title, one of the greatest seasons in A's franchise history. This level of success on such a small budget, and without 'star' level players on the team, quickly made waves around the league. Many general managers quickly adopted Beane's approach of leveraging advanced analytics to compare and acquire players. With this, the field of data analytics in sports started receiving millions more in funding. This style of management has paved the way for the success of small market teams across professional sports and showed owners and general managers that money is not the only factor that drives results.

In the National Basketball Association, the Oklahoma City Thunder have used data analytics and long term analysis to form one of the brightest up and coming teams in the league. One aspect that the OKC Thunder were particularly focused on was drafting and developing young players rather than trying to acquire players who were already well established in the league. This came partly out of necessity, as in the NBA there is less difference in pay between

teams but players have more control over what franchises they want to play for. With this ability, the brightest star usually favors teams with an established reputation for success in the biggest markets such as Los Angeles and New York. Entering these big franchises allows them to grow their personal brand with more fans, and therefore gives a competitive disadvantage for teams in smaller cities like the Oklahoma City Thunder.

In order to combat the inability to acquire established stars, the Thunder have gone all in on drafting the most promising players entering the league. With the second overall pick in 2007, the Thunder, then named the SuperSonics, selected Kevin Durant. The league had not seen a player like Kevin Durant before, with the ability to dribble, create his own shots, and shoot 3 pointers all at 6 '11. Based off of these attributes as well as his high scoring efficiency and shooting percentages during his time at the University of Texas, new general manager Sam Presti decided to go all in on Durant as the future face of the team. Durant quickly started to show his promise, and Presti continued his draft success by selecting two future league MVPs, Russell Westbrook and James Harden in 2008 and 2009. Durant, Harden, and Westbrook, referred to as the OKC big three, lead the franchise to a level of success they hadn’t seen in decades as they reached the NBA finals in 2012.

Following the loss to the Miami Heat in 2012, the Thunder were put in a tough situation trying to retain 3 of the league's brightest stars in Oklahoma City. With salary cap limitations and expiring contracts, the Thunder’s management team decided the best long term plan for the franchise would be to trade Harden, breaking up the big three but providing the team long term assets in the form of draft picks for future years, as well as freeing up cap space in hopes of retaining Westbrook and Durant for many years to come. While Westbrook and Durant continued to be successful in the following few seasons, Durant would leave when his contract expired in 2016

and following that Westbrook expressed interest in being traded. The Thunder's management team was able to once again capitalize on the value of their developed star by trading Westbrook to the Rockets in exchange for Chris Paul, first round draft picks, and pickswaps which would allow them to better their draft position in coming years. Knowing that it would take a few years for the team to be successful again after losing their star players, the management team decided to go all in on rebuilding the franchise. The team traded away established talent Paul George for Shai Gilgeous-Alexander who was a promising young guard off of his rookie season as well as more first round draft picks in the future. The trade of Westbrook and Paul George, pretty much all of the talent that the team had at the time, came as a surprise to many as this put the team in a position where finding success in the coming seasons would be nearly impossible. However, now that Shai Gilgeous-Alexander has become one of the faces of the league and the Thunder have obtained many talented first round draft picks, we can see the brilliant management and trust in future projections that led general manager Sam Presti to make the moves he did in 2024.

Obviously acquiring draft picks and selecting players who are projected to be successful is only half of the battle in developing future stars. The Thunder are known for their use of data analytics and sports performance technology to optimize the performance of their players. By following stats such as shooting percentages, movement patterns, and physical stress levels, team staff are able to identify weaknesses and target their training to improve a player's overall skill set. With this information as well as biomechanical analysis, the team has successfully protected their investment in young players by identifying and preventing potential injury risks. The team utilizes personal nutrition and recovery plans in order to ensure each player is both mentally and physically prepared to perform. Finally, team management has placed emphasis on the

importance of having a positive team culture that prioritizes teamwork and strong work ethic for their developing players.

The Thunder have now successfully completed their rebuild, going from 22 and 24 win seasons in 2020 and 2021 to a 57 win season this year (2024). Not only has the team begun to find success, but they are developing some of the most talented and projectable players in the league such as 7 '1 Chet Holmgren, Josh Giddey, and Luguentz Dort. This success should have a lasting impact too, as the Thunder still have first round draft picks as well as pick swaps for upcoming years from their previously mentioned trades. Serving as an example of how beneficial a rebuild can be to the long term success of a franchise, the Thunder have inspired other teams, such as the Brooklyn Nets, to follow a similar path. After failing to find success with former Thunder stars Kevin Durant and James Harden, the Nets decided to follow in the footsteps of the Thunder by trading away their star players in order to acquire future draft picks and younger, less proven players. While some teams are prioritizing the future well being of their franchise, many other teams such as the Los Angeles Lakers and Phoenix Suns are eager to acquire established stars with a ‘win now’ mindset potentially at the cost of the long term success of their team.

The transition to professional sports management decisions driven by data analytics has not come without opposition. Some general managers and other industry professionals still believe that traditional methods of scouting and coaching players are more effective and reliable than the use of data analytics. While there is something to be said for an individual's abilities beyond statistics, those who oppose the use of data analytics have found themselves at a disadvantage compared to those who are implementing the practice. This has led to almost all professional sports teams having built out data analysis teams on their payroll who play a crucial part in analyzing and working with the management teams to make optimal decisions. Another

concern is that treating players as simply data points and not taking into account human emotions and complicated situations players may be going through is ethically wrong. This is part of what makes managing professional sports so interesting, as while the data paints a picture and can lead a team to making optimal decisions, dealing with the emotions that come with professional sports is an important part of being a good manager. This is one of the reasons many of the most successful teams have a strong culture surrounding them such as the Oklahoma City Thunder. Finally, some fans worry that these changes will fundamentally change and ruin the way sports are played. It is true that the influence of data analytics has greatly changed the look of the games, but some leagues are taking action to preserve tradition. In Major League Baseball, new rules have been passed to prevent players from shifting too far out of position, this means that players are forced to play the game in a visually similar manner to how the game has looked for over 100 years. Other leagues such as the NBA have embraced and even benefited in many ways from these changes. As the 3 point shot was found to be a statistically more optimal option compared to the 2 point shot, the number of 3 point attempts skyrocketed around the league in the past 20 years. This change has led to the rise of shooting specialist stars such as Steph Curry and gives kids without the 7 foot stature of an NBA big man hopes that they too can make it to the league.

In order to look towards the future of professional sports management we must acknowledge the increasing role that data analytics will play. Managers will likely implement more artificial intelligence technology to help case by case analysis to make optimal decisions based on large amounts of data. Additionally, there will be a continuation of predictive analytics to optimize training and produce better tallent. This will be a win win for general managers who can protect their players and fans who will get to enjoy an even better product. Not only will

general managers and fans gain from this but also will the players, who will be able to avoid the harmful physical impact that playing professional sports can often have. Lastly owners will likely operate at greater profitability as decision making is increasingly controlled by machines. Hopefully these profits will be reinvested into creating a better product for all parties involved.

The pioneers who utilized data analytics to find success such as the Oakland Athletics transformed the role of general management and the industry of professional sports as a whole. Teams from across different leagues now utilize a staff of data scientists to advise managing decisions, changing the way the organizations approach their acquisition and development of players. The role that data analytics plays today is changing the way sports are played, forcing leagues to adapt, and as this technology is further implemented into the future the product of professional sports will develop with it.

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