Lesson 3 A Game Changer: Using Data in Sports

The Power of Data in Sports

When the Oakland Athletics, a Major League Baseball team, won 20 games in a row in 2002, the professional sports industry was shocked. The Oakland Athletics were a small team with limited funds, which made it difficult for them to attract elite players. How did they do it? The key to their success was adopting sabermetrics, a statistical model used for making decisions in baseball.

Sabermetrics was created in the late 1970s. It tries to use large amounts of information to discover patterns, trends, and insights that are difficult to find with traditional ways of studying statistics. Normally, coaches and managers prefer players who can hit the ball hard and far, for such players tend to hit more home runs and extra-base hits. Sabermetrics suggests that players' offensive skills can be better measured by the frequency with which they safely reach base. It does not matter whether this is achieved through hits, walks, or hits by pitch.

Sabermetrics had not been widely used until the Athletics adopted it in 2002. With sabermetrics, the Athletics were able to identify underrated players with significant contributions to winning and built a strong team on a small budget. The success of the Athletics prompted other teams to quickly adopt sabermetrics, sparking a movement to utilize data not only in baseball but also in other sports. Thus, sports data analytics emerged as a systematic approach to predict game outcomes.

In soccer, the Liverpool Football Club of the English Premier League is similar to the Oakland Athletics in baseball. In 2010, Liverpool underwent a change in ownership. While data analysis was already prevailing in the Premier League at that time, the new owner of the club, who also owned a baseball team in the United States, aimed to push data analysis in soccer to new heights. So he demanded that the club form a new data team.

The new team included a physicist from Cambridge, a nuclear scientist from Harvard, and a former chess champion. What they had in common was significant expertise in data. The team started to apply data analysis in key areas of club management, including player recruitment, injury prevention, and strategy during the game.

The team analyzed large amounts of data to recruit players who fit the team's style of play. In training, they collected data on players' movement patterns, heart rates, and vital signs by using GPS trackers and sensors to prevent injuries. During games, they used live data to make tactical decisions such as substitutions and formations. The data team was praised for its efforts when the Liverpool Football Club won the league championship for the first time in 30 years in 2020.

The emergence of sports analytics did not go unnoticed by the Korean sports industry. One notable example of success is the Korean women's curling team. Following its debut at the Winter Olympic Games of 2014, the team recognized the need to enhance its sweeping technique. Sweeping melts the ice and makes the stone move faster. If too much ice melts, however, the stone moves too fast and misses the target. On the other hand, if not enough ice melts, the stone stops before reaching the target. The amount of ice melting depends on the sweeping speed and pressure. Applying too much pressure slows down the sweeping speed, and focusing only on speed makes it hard to transfer enough force to the broom. Finding the right balance between speed and pressure is important to melt the right amount of ice.

To identify the most effective technique, the Korean team designed a sweeping measurement device. The device consisted of infrared cameras and sensors attached to the players' bodies, shoes, and brooms. Through the device and motion-capture screens, foot pressure values and other data were obtained for analysis. After monitoring changes in the temperature of the ice surface, the team concluded that speed was more economical than strength for sweeping. The use of data analysis was critical in the team's winning of a silver medal at the 2018 Pyeongchang Winter Olympics.

The successful use of sports analytics was not limited to the curling team. The Korean women's archery team had dominated the sport for decades. However, the team turned to sports analytics to maintain its edge over its rivals in preparation for the 2020 Tokyo Olympics. The team developed a system to monitor players' heart rates by using advanced visual computing technology to convert facial color variations into heart rates. This data was used for psychological training to help players maintain stable heart rates during crucial moments.

The team also created an AI coach that helped adjust shooting form. The team managers requested that the AI coach edit training videos of the players to assist with practical analysis. Players and coaches used the edited videos to analyze the players' usual habits or weaknesses. The active use of data analysis by the Korean women's archery team handed them their ninth Olympic gold medal in a row in Tokyo.

There are still limitations to what data analysis can capture in games. Factors such as team chemistry, which is related to how well people get along, will likely remain difficult to measure. Similarly, predicting player performance in a match cannot be entirely accurate as players are humans and not machines. Still, sports analytics is undeniably elevating the level of play across various sports, and fans are enjoying this development.

3과 Further Reading

Hidden Numbers in Baseball

In baseball, the ball and the bat have hidden numbers that can greatly impact the outcome of a game. A baseball has 108 double stitches, creating raised lines on the ball called seams. The seams help pitchers grip the ball better and transfer more power and spin when throwing it. A spinning ball can change directions in the air because of the air pressure around it. This is called the Magnus effect. The seams make this effect stronger. Pitchers can use this effect to control the ball's direction and speed, creating pitches that are difficult for batters to hit.

While pitchers try to throw challenging pitches by utilizing the ball's seams, batters attempt to make contact with the ball accurately in the hope of hitting a home run. The secret to hitting a home run lies in the baseball bat. The bat's overall length must be fewer than 106.8c m long and the diameter of the thickest part must be fewer than 7 cm. If a player hits the ball about 5-10 cm from the end of the bat, the ball will fly the farthest and give the player the most thrilling and sweetest feeling. That is why this area is called the "sweet spot."