

Baseball by the numbers: one man's journey into the world of analytics

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Obradovic, who sees himself as the Jonah Hill character on the screen, came in at the right time for the Phillies as they were the last team in league to have an analytics department. "Starting late ended up providing us with a paradoxical benefit because we were starting with the latest technologies, like all the startups do so, at that point, we were able to move a lot faster than the teams that were stuck with older equipment."

With dozens of high-speed cameras in each stadium, major league baseball uses a program called Statcast that was introduced in 2015 which measures all sorts of events that take place during a baseball game by tracking the movements of the ball and the players on the field.

The raw data from every game each day is downloaded to all 30 teams the next morning. That may seem simple enough, but last season Statcast recorded 53,380,301 metrics from 1,435,241 pitches and 328,405 balls in play, according to Yahoo Sports. Starting when the ball is

pitched, the cameras will track the spin of the ball, determining its speed, the axis of how it's spinning and curving through space. They also track the batters and where the players are on the field.

As the Principal Engineer of R & D, Obradovic's job is to facilitate the work of the analysts. "I create the technical infrastructure that allows them to ask questions efficiently," Obradovic said. "Statistics have always been an important part of baseball. Everybody could talk about batting average and earned won average. We just have better statistics right now, so we try to tease it out and yet there is also the element of luck. We get about two terabytes of data each game (a terabyte equals 1 trillion bytes in computerese). We have this avalanche of data, and the question is what we do with it. That's where I come in. I create the technical infrastructure that will allow our analysts to get the results they are looking for which allows the smart people to ask the relevant questions in every area of baseball

operations."

With the Phillies playing the Houston Astros in the World Series, a season's worth of data for each team is being used to find tendencies in their opponents as they each developed their game plans.

For example, the Phillies know that during the regular season, the Astros threw the third-highest percentage of four-seam fastballs that averaged at least 18 inches of Induced Vertical Break. Conversely, the Astros know that the Phillies performed well on pitches like that.

The Astros know that the Phillies threw the second-highest percentage of pitches located on the inner half of the plate during the regular season. Conversely, the Astros were the sixth best team on pitches located on the inner half of the plate.

"And that's what I love about this," Obradovic said. "The batter knows that the pitcher likes to throw outside but the pitcher knows that the batter knows this so he may throw a heater inside but he knows the batter may be thinking the same

thing so he may then decide to throw it on the outside corner. It's a real cat and mouse game that never goes away."

This only scratches the surface of what the analysts do. Not only scouting their opponents, they will also work with their coaches on improving an individual player's performance. "For example, with the videos and computer analysis, we were able to determine how a pitcher's motion was different on his good and bad days, something you could not see with the naked eye," Obradovic said. "It's the same with batters who may be in a slump, and often we'll find that all it will take is a minor adjustment for them to get back on track."

They will also work with the trainers in helping to determine the best therapy for each player and the scouts with their evaluations in preparation for trades, free agency, and the draft.

Analytics departments are no longer restricted to the major leagues. "All the stuff that we do is trickling down to the major colleges and even some of the


smaller schools," Obradovic said. "It's just a matter of time until it reaches down to the high schools and the youth sports as well."

Coaching little league in Lamorinda, Obradovich, also plays the numbers game. "We track the number of pitches thrown with a maximum of 55 pitches," Obradovich said. "However, it doesn't take into account the warmup pitches and the throws to first base."

As much as Obradovich enjoys his work, he makes it clear that it's not for everyone.

"Working in computers requires that you have a love of learning because the evolution of technology is a constant thing," Obradovic said. "When I spoke to students at Campolindo about a career in computer or data science, I made it clear that to work in this area, you have to love to learn new things all the time. It's a great career because every six months, there are new things being invented. It's a full-time job to stay on top of things and in my case figuring out how to apply it to a team's performance."


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