



Houston Astros

Challenge

Fulfill a long-shot prophecy. When in 2014 Sports Illustrated projected an Astros victory in the 2017 World Series, few believed the worst team in the American League was up to the task.

Analytics for the win

How the losingest team in baseball found a competitive edge with analytics and rode it four years later all the way to the World Series

Though many in 2014 saw the Sports Illustrated projection that the last-place Houston Astros would win the 2017 World Series as further than a long shot, the Astros' front office was confident in what was at the time an unconventional strategy. That strategy hinged on the work of former NASA engineer turned sabermetrician Sig Mejdal, who first walked into the offices at Minute Maid Park in 2012.

If you're going to try to build a championship team from scratch, "you want to figure out how to take advantage of what's discoverable and acquirable," says Mejdal, then the Astros' Director of Decision Sciences. Now Special Assistant to the GM, Mejdal describes his remit as improving the processes by which the Astros' decision makers – scouts, coaches, even players – apply the findings of the team's analytics group. "Analytics permeates the entire [Astros] organization," Mejdal says, "the decision to draft a particular player, the instructions he gets in player development, the decision to promote him, how he attacks a specific pitcher, where he stands on defense – analytics is a part of all of that. It's impossible to separate analytics from what we do."

Analytics, no longer a novelty, is now 'table stakes' in baseball

Baseball has always been a game in which stats mattered. But Mejdal says that as the means of collecting information have gotten better and better, data has become truly ubiquitous. For example, new technologies like radar devices can now measure the release point, speed, movement, spin and location of every pitch – and record the same for batted balls. When combined with traditional scoring methods, these technologies provide teams with a vast number of data points.

In fact, every major league team in America now has at least one quantitative analyst – someone like Mejdal working behind the scenes to interrogate the numbers. Whereas in the beginning of his career in sabermetrics, nuggets of statistical insight in any amount were enough to give an analytically savvy team the edge over a data-naïve competitor, quantitative analytics in baseball today is just "table stakes," Mejdal explains. "When there were only four analysts in baseball, it was easy to stay ahead of the curve – the inefficiencies were giant. But now, like in any mature industry, the inefficiencies become smaller and harder to come by," he says. Take all this readily available data and throw in capable sabermetrics programs at every front office around the country; what you get is as competitive a playing field as baseball has always been. But that doesn't mean there's not a competitive edge to be found.

The Astros gain a competitive edge through teamwork

When analytics is an arms race, as Mejdal describes it, the competitive advantage comes increasingly less from data access – or even the kinds of statistical insights you can glean from the data. Rather, teams that are most successful in their analytics programs are those that, like the Astros, have built a culture where individuals across all parts of the organization work together to take advantage of the data they're given.

"I don't think what we are discovering is too different from what others have already or soon will discover," Mejdal says. "Where I think we (the



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Sig Mejdal, Special Assistant to the GM



Astros) do very well is in taking advantage of the findings. From the GM to the manager to the coaches to the scouts to the players – they all are embracing analytics and the efforts to do something a bit better. It’s incessant.”

This harmony within the organization is what makes the Astros great. For one, the growth of decision sciences in the Astros’ front office hasn’t detracted from the team’s reliance on expert valuations and the opinions of scouts and coaches; in other words, the art of baseball has not been eclipsed by the science. And coaches and players have been eager to experiment with the insights they receive from analysts. Being the first to discover a pattern may still be a challenge but, Mejdal says, “also important in the formula is having a culture in which you’re prepared to take advantage of the findings once you discover them. And that’s what our GM, Jeff Luhnow, has been so good at creating.”

When the scientific method is the strategy

“Analysts have come into baseball, and what they’re bringing in is a process to test hypotheses in a structured way,” Mejdal explains; the scientific method is the strategy. And sabermetricians are positioned to apply that method – with the help of new technology and statistical tools – to investigate the merits of conventional baseball wisdom. Having come into sports analytics in the field’s early days, Mejdal had to build that toolkit for himself. “At the time, we had R and XL Stat,” Mejdal recalls. So it came as a surprise when Mejdal got a call one day inviting him to speak at a conference hosted by statistical software company JMP. “I had not used JMP, I did not own JMP, and then when I got to the conference I could see the passion these users had with this software program and I couldn’t believe it. That got me curious to try JMP, because frankly I didn’t care for another off-the-shelf software program that I needed to learn.

But then when I took a look I was just wowed with the product. ... That combination of intuitiveness, capability and speed is hard to find.”

In baseball, Mejdal says, data exploration is not only useful – it’s mandatory. Analysts may not know exactly what they’re looking for until they see a pattern in the data to investigate further. “Before you jump in with a specific statistical technique, it’s a best practice to look at your data, explore it, visualize it and get a general understanding as best as you can of what you’re working with. It helps you decide which statistical technique to use,” he advises. “And [when it comes to data exploration,] I haven’t seen anything that could compare with JMP Graph Builder. Just that ease of use, the flexibility, the capabilities. If you want to encourage data exploration, JMP is so inviting.”

Visualization in JMP® facilitates important communications

Data visualization helps the end user too; in baseball, the front office’s data insights are only as useful as the players and coaches make them. “We need to connect to the [on-field end users]. We’re asking them to some degree to change their behavior. In my experience, that doesn’t just come with saying ‘Hey, I did some analysis. Here’s a number. Use it.’ Instead, the more you illustrate what’s behind [the stats], connect an anecdote to it, the better off you’ll be.”

As they say, a picture is worth a thousand words; similarly, graphics help on-field experts understand and operationalize data insights. “The more you can remove [coaches and players] from the black box of analysis and toward an understanding – a visualization of what’s going on – the better.” Mejdal explains. “It’s wonderfully satisfying to have played a role in acquiring a player and then seeing him years later succeed,” Mejdal says.

Solution

An analytically minded front office working in tandem with astute scouting talent to discover practical insights; a forward-thinking coaching staff prepared to embrace data in on-field decision making.

Results

The Houston Astros went from losing more than 100 games for three years in a row to being crowned World Series champions, proving that analytics, no longer a novelty, is now “table stakes” in baseball.

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