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Numbers Game

Technological tools take player analysis to a whole new level

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Sam Hinkie, Houston Rockets executive vice president of basketball operations, knows the cold calls all too well. The ones that come constantly from various technology firms seeking to sell the club new products designed to provide high-end player performance analysis.

"There's no question we're getting approached a lot. We're talking with a lot of vendors, at least on a weekly basis and often more than that," Hinkie said. "But I'm happy to be a guinea pig. If we want to be on the cutting edge, and we do, these are conversations we need to have. It's core to what we're doing."

The statistical revolution in professional sports, of course, is hardly news. Baseball statistician Bill James first began to popularize sabermetrics in the 1970s, and is now employed by the Boston Red Sox. Michael Lewis' profile of the Oakland A's and their more qualitative approach to roster development, "Moneyball," was a New York Times best-selling book in 2003. Hinkie's boss, Rockets general manager Daryl Morey, co-chairs a high-demand industry conference every spring at the Massachusetts Institute of Technology devoted to sports analytics. And many teams across the four major American pro sports leagues now employ at least one full-time "number cruncher" to perform statistical analysis on current and prospective players.

But thanks to the convergence of several factors, the technological tools to perform that analysis and take it in myriad new directions are becoming increasingly powerful. And fueled in part by newer innovations such as real-time motion tracking, advanced statistical algorithms, and high-definition and highly searchable online video, the number of firms entering or expanding their business presence in player analysis is quickly accelerating. Tablet computers, such as the iPad, and increasing computing power also are contributing to the trend.

Massachusetts-based TruMedia Networks, which over the past several years has carved out a niche in digital media and interactive marketing, recently launched an analytics business under the banner of TruMedia Baseball Analytics, and is now working with the San Diego Padres and one other undisclosed MLB team.

Bloomberg Sports, an outgrowth of the well-known financial news and information company, late last year began a push with MLB Advanced Media to provide MLB teams the same kind of advanced player analysis it performs within the financial markets, and is developing a similar push into football.

Stats, a household name in news and statistical data, is similarly launching a new unit called the Sports Solutions Group to provide analytical products and services for front-office, coaching and scouting personnel. The company has hired John Pollard, a former executive with data visualization firm IdentityMine, to run the unit, and the operation will be linked heavily with Stats' SportVU motion tracking unit.

Sportvision, whose Pitch f/x tracking system developed in partnership with MLBAM helped revolutionize pitching evaluation half a decade ago, is preparing a full rollout across MLB of its Field f/x system that



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Technological tools take player analysis to a whole new level.

will similarly track the movement of baserunners and fielders. The system, first tested at San Francisco's AT&T Park, promises to yield an unprecedented wealth of new information for teams.

StratBridge, a Massachusetts technology firm, is expanding its player analysis business to join a thriving operation in ticket sales analysis, and is now working with more than two dozen NBA, NFL and European soccer teams in evaluating players.

XOS Digital, an early pioneer in computer-based coaching tools, particularly within the collegiate ranks, continues to develop and expand its Play Action Simulator, a product created in partnership with video game publisher EA Sports that turns football video gaming into a living playbook.

Synergy Sports Technology, already a dominant analytical entity within basketball circles, is deepening its ties with the NBA and EA Sports. And dozens of other firms are similarly looking to take their own piece of this growing business.

"The ability to quantify and qualify player performance now presents an absolutely amazing opportunity," Pollard said. "There are things that can be done now instantaneously that used to take days or weeks, which is very exciting.

"I was having a conversation this summer with an executive of an NFL team that I won't name, but he wasn't a technical person. But as we got into some of the motion tracking and things we were doing, we had a conversation about one play that went on for two hours. All the implications and permutations within that play that were now exposed. That was one of many eye-opening moments that made me think we had a really big opportunity on our hands."

Answering deeper questions

With the benefit of emerging technologies such as motion tracking, which operates by treating players and the ball as X and Y coordinates on a mathematical plane, there is now no piece of player performance that can't be sliced and diced and then immediately compared against that player's own history and compensation, and those of other players.

For example, it can now be easily determined what the arm angle and release point was for a pitcher on every pitch that resulted in an extra base hit against a given opponent in a chosen game situation. Or the release angle on every successful three-point shot for a particular basketball player from a certain spot on the floor. Or the exact velocity and trajectory for one soccer player's successful corner kicks against a chosen opponent. And on and on the possibilities go, with teams using the technology both to refine their own players' performances as well as scout opponents for weaknesses.



Sportvision's Pitch f/x system identified a problem in CC Sabathia's throwing motion.

Hank Adams, Sportvision chief executive, likes to cite the example of pitcher CC Sabathia's 2008 season with Cleveland and Milwaukee. Sabathia, then the reigning American League Cy Young Award winner, started the year 3-8 for the Indians and concerns grew as to what might be wrong with the pitcher. Sportvision's Pitch f/x data found that Sabathia's release point had dipped slightly and that his arm angle was lower.

Once corrected, Sabathia returned to his usual, dominant form, particularly after his trade that summer to the Brewers. And during the subsequent winter, he signed a \$161 million free agent contract with the New York Yankees.

"There are many, many stories like this now where the data is making a big impact," Adams said. "And the [Society for American Baseball Research] guys have also really furthered the cause, helping show the

importance of this data to everybody. There's no question we've come to a tipping point in this area."

But within the technological explosion, the prevailing trend within player analysis is a high degree of team customization. Preferences in playing style, roster development and budget management, of course, vary widely by team, market and sport.

So for vendors selling player analysis systems, flexibility is paramount. So, too, is discretion and secrecy, as most teams ferociously guard the details of their player analysis processes, refuse to talk about them publicly, and typically require vendors to sign strict nondisclosure agreements.

"Having cool technology is great and all, but what we're really more interested in, ultimately, is helping

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answer the deeper questions," said Matt Marolda, StratBridge founder and chief executive. "And what are the right questions? What are the things that translate to wins? That's a very important thing. A lot of this is situational, and varies a lot, and everybody is looking for that extra edge. So you're always needing to look around the corner."

Beyond answering those deeper questions and searching for what "Moneyball" called market inefficiencies to exploit, most player analysis systems also focus heavily on data visualization. For many systems, the customized player analysis is directly linked to an array of charts and graphs designed for easy understanding, an overt catering to busy team executives constantly pressed for time. And in many cases, video is directly linked, too. Both the TruMedia and Bloomberg systems, for example, can isolate the outcomes of every 3-2 pitch to a chosen player against a certain pitcher, and immediately display the tagged highlight clips of each one of those pitches.

"Time management is really important to teams, and they all have different needs. So for us, it's really key to provide a lot of different choices on how data is displayed," said Bill Squadron, head of Bloomberg Sports. Twenty-eight of 30 MLB teams have used Bloomberg's "Pro" analysis product this season on a trial basis, and the company is now seeking to convert those into full-time paying clients beginning with the 2011 season.

The iPad revolution

Arguably the most dramatic advance within player analysis has not been within the number crunching itself, but the ability to take the research anywhere and access it through a simple touchscreen. Apple's iPad tablet device, which sold more than 3 million units in just 90 days following its April debut, is now a must-have business tool for dozens of GMs across the major sports leagues.

"The iPad has been huge for us," said Jed Hoyer, Padres general manager. The club's work with TruMedia, which features iPad functionality in its analytics system, derived from Boston, where both Hoyer and TruMedia Chief Executive Rafe Anderson previously worked together for the Red Sox. "You're really not going to carry a laptop into the ballpark, so having the wealth of data right at your fingertips is a huge convenience, certainly while you're on the road."

Anderson said the iPad, and tablet computing in general, was a central part of the business plan when TruMedia began to develop its business strategy for player analytics.

"This marketplace is already really competitive, and it's getting more competitive," Anderson said. "The companies that are going to be successful are the ones that embrace mobile solutions like the iPad, as well as open [application programming interfaces] where teams have the flexibility to bring in their own data as well."

Many of TruMedia's competitors are similarly developing iPad components to their analytics businesses as well. One of Bloomberg's emerging products under development is an iPad application for players that will turn their game study into a fully immersive, interactive experience.

"We're huge believers in the mobile platform and are definitely looking to make our products available on multiple platforms," Squadron said.

Some ballparks, most notably Yankee Stadium, do not allow iPads in the general seating bowl for fear of fan injury. But with a series of Apple rivals feverishly developing their own attempts at an "iPad



This example shows how Stats can break down the Jacksonville Jaguars' running game in third-and-short situations and highlight which side of the line has had the most success.

killer," the tablet frenzy shows no signs of abating.

"We're looking very strongly at the iPad, no doubt," said Randy Eccker, XOS Digital co-founder and executive chairman. "Security has always been a key priority for our coaching clients, and it still is, but portability is becoming even more important."

The business opportunity

For as active as the player analytics space is becoming, there remain inherent limits to what it is and will be. Teams are frequently spending five-figure, and in some cases six-figure, sums each year for analytics systems and products. But there are still only 122 teams across the NFL, MLB, NBA and NHL. NASCAR, colleges and other sports such as soccer add to that total. And international territories, such as MLB camps in the Dominican Republic and Japanese baseball teams, present newer opportunities, too. But there is still a peak in what the scale of this business can become.

As a result, virtually every company operating in the space maintains some other significant component to their business, such as Stats' core business in data distribution and Bloomberg's hefty presence in the financial markets. And as much as possible, vendors will seek to have their analytics work for teams complement their efforts in other areas, such as data distributed to media outlets.

"Could player analysis support itself for a company? Maybe," Adams said. "But this data is often very useful, and as long as it's good storytelling, there's going to be demand in consumer-facing applications. The Pitch f/x data has been out there for the public to see, and the public has definitely helped teams and the industry inform our understanding of it. And you want to have that information, where you can, for the fans. That's certainly where we came from, servicing the media."

And there is the old dynamic, highlighted in "Moneyball," between the new-school team thinking built on statistical analysis and old-school mores built upon traditional scouting. Since "Moneyball," the most successful teams have been able to merge the two schools of thought, and many vendors agree that blending is the proper approach.

"We are qualitative people, but numbers still can't substitute for good eyeball stuff," Marolda said. "There's the old adage that the best scouting combines the numbers, the eye and the ear."