

THE RISE OF ATHLETE-DRIVEN MEDIA

HOW ADVANCES IN HUMAN PERFORMANCE TECHNOLOGIES
CREATE NEW STORYTELLING CONTENT FOR SPORT

Produced by:



sports
innovation
lab

Athlete Data
Leadership Board

ATHLETE DATA & ANALYTICS WILL TRANSFORM SPORTS ARE WE READY?

The emergence of advanced data capture and analytics should excite sports properties. Despite some enduring skepticism, coaches and athletes will benefit from more effective athlete data solutions. They will gain greater insight into how athletes move, respond to external pressure, and recover from strain and injury.

But the benefits of innovative athlete data solutions extend beyond athlete and on-field performance. Sports media companies will also benefit from emerging human performance technology. As the industry learns about the athletes themselves, opportunities will emerge to engage Fluid Fans™ longer, and align them more deeply with the athletes they follow.

The market reality: No one company has figured out the best way to **collect, analyze, and deliver** athlete data.

The early days of any emerging market are messy. New technologies threaten to set new standards and eclipse the "old way of doing things." To move with clarity and confidence, the industry needs a strategic framework to hone in on what athlete data matters and why.

Integrations and partnerships will be key to driving the maturity and evolution of the market. Early experiments with emerging data collection technologies will help determine who wins in the athlete data market and who gets left behind.

ALL ATHLETE DATA SOLUTIONS MUST MASTER “THE NEW STACK”

Athlete data comes in many different forms: there is on-field data, off-field data, and everything in between. To use this data effectively, the industry will need to find technology solutions that master three core areas of athlete data and advanced analytics.

We call this solution the athlete data "stack."

The athlete data "stack" has three components:

1. Collection

Collection technologies combine hardware solutions and software solutions, from wearables and camera systems, that capture how, where, and when an athlete moves on the field of play.



2. Analysis

Collecting the data is only the first step. Interpreting the data requires different expertise and an integrated suite of technologies to understand what data is important and to whom.



3. Delivery

Once the data is analyzed, it is ready to be presented. Technology companies must know who they are designing for when they develop dashboards, media displays, or trigger alerts that notify users when something meaningful is occurring.



Sample of the more than 600 companies in the Quantified Athlete sector

“The PGA Tour is pioneering athlete-centric media for fans, announcing they will broadcast “every shot, of every player, on every hole” at the 2020 Players through its digital OTT channels. So it will be interesting to see how the fans react when they have the option to choose.”

Jeremy Aisenberg
VP of Strategic Initiatives, Ocatgon




HOW THE MARKET WILL EVOLVE

TODAY

Human performance and media solutions co-exist in a world where hardware and software providers struggle to prove the accuracy and speed of their solutions. While some vendors specialize, solutions often combine multiple sensors and data readouts that make it hard for analysts to get insights and context from Os, Is, Xs, and Ys.


TOMORROW

In the future, we expect collection technology will standardize by sport and the emphasis for value creation will shift from collection to analysis and delivery. The early leaders will have years of experience and large data sets. This lead will enable companies to create derivative metrics and novel storytelling opportunities from this data.



“Right now, the industry would benefit most from a state of the union as it pertains to athlete data collection and use.”

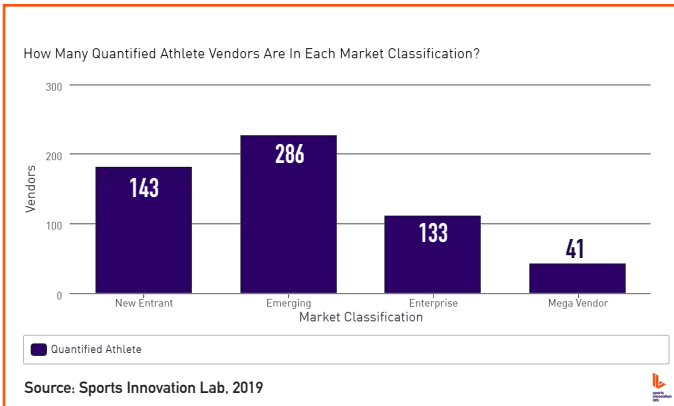
Dr. Brian Moore
CEO, Orreco



[on Teamworks platform] “This past season, we collected all match information for 752 regular-season matches in the Championship and League One through Teamworks. Those reports that would previously have been sorted manually all now live within Teamworks, where we can organize them as needed. In an environment where timing is everything, having that level of transparency is critical.”

Justin Papadakis
Chief Operating Officer, United Soccer League

TRACKING THE MARKET



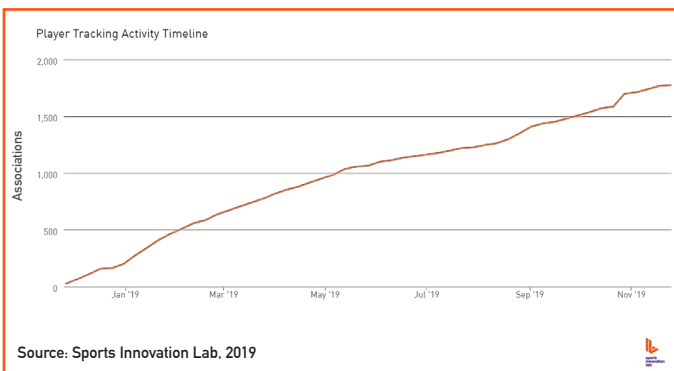
The Sports Innovation Lab's system is tracking more than 600 companies in the Quantified Athlete space. We define this space as any company that specializes in collection and analysis technology. These functions are internal and not fan-facing, therefore delivery technology is not included as it is primarily a fan-facing service. This is why integration and consolidation are critical to this market's success: delivering the data to fans requires expertise outside the traditional Quantified Athlete market, in media and sponsorship. Partnerships will become increasingly important in order to make athlete-driven media possible.

"The most important hurdles anytime athlete data is in question are privacy, access, and control. While we see huge opportunity working with partners like the San Francisco 49ers and the US Ski and Snowboard team, this industry still has not agreed on these three imperatives and there's so much room to grow."

Kate Blanchard
COO, Orig3n



SHIFTING TO ANALYSIS & DELIVERY



This chart shows the cumulative growth of collection technology associations between professional sports and collection technologies. Leagues, teams, and federations are still testing and perfecting their collection solutions. As they master this first area, the emphasis will shift from collection to analysis and delivery.

"A number of these wearable and sensor companies fly pretty loose with their science, and unfortunately, these vendors have really made it hard for the market to tell the good from the bad. We work a lot with the military and the tactical athlete. There's a very strong awareness that this data can inform readiness and aid with recovery. Sports needs the same rigor."

Dr. Leslie Saxon
Executive Director, USC Center for Bobby Computing



SOUNDS EASY ENOUGH IT'S NOT

THE MARKET IS MESSY

Investment confidence is growing in athlete data solutions. Each layer of the athlete data-driven storytelling stack has technology solutions that are backed by venture capitalists and investors who see the promise of unlocking the human performance insights in professional sports. Their investment thesis is a sound one: professional athletes are elite human beings. If we understand their performance better, we can use those insights to expand these businesses from the general population, in health and/or in the military. This is the same promise that is driving larger companies like Alibaba, Amazon, Google, IBM, and Microsoft to enter this market.



“There is still no standard way to collect, manage, and use athlete data. This makes it hard to navigate contracts among vendors, players, and teams. We need some sort of consistency across the industry to push this forward.”

Bobby Basham
Director of Player Development, Chicago Cubs



“The biggest challenge has been getting sports organizations to buy-in on collecting their athletes’ data. It’s even harder to get compliance from the athletes to collect their own data around the clock. The reality is if someone got that level of buy-in, they would own this market.”

Kristen Holmes
VP Performance Optimization, Whoop

DESPITE THE INVESTMENT, RESEARCH, & DEVELOPMENT, THE INDUSTRY IS AT A CROSSROADS

1. Collection technologies still need to win the trust of the market.

After decades of investments in sensors, GPS, RFID, and optical solutions, the industry is still a good distance from having the data standards necessary to collect accurate athlete data. Even the professional leagues that use advanced player tracking solutions admit that each year the systems get better. According to one league official, "the players are not getting faster, the system we use is getting more accurate."

2. Analysis companies serve too many masters.

Professional sports organizations aren't necessarily staffed to evaluate data systems or optimize the use of athlete data. Player tracking systems are often put in place for one function, for coaching purposes, but end up serving another, as we saw with the NHL player tracking test in January 2019. These data collection and analysis systems must be designed with integrations and openness in mind so they can serve specific purposes, and remain agile enough to adapt to the market.

3. Media companies have bigger fish to fry.

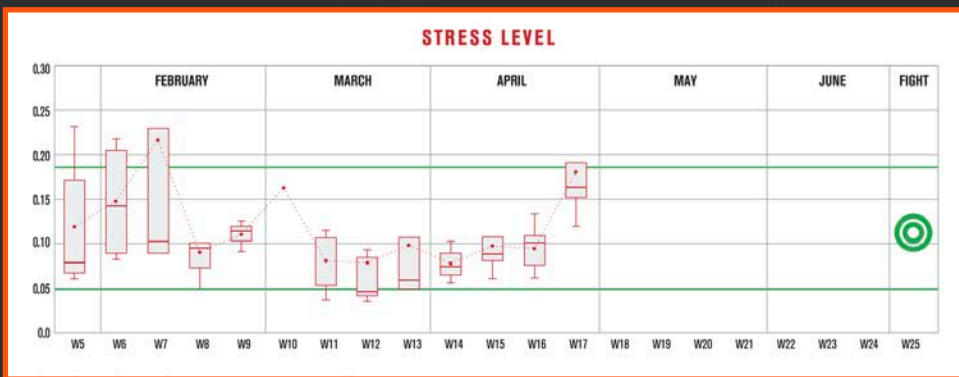
All of this collection, storage and analysis is expensive. The industry has not yet figured out the business model for athlete data and other fires like the changing OTT and broadcast landscape have consumed executive attention. Executives need to make more progress on their media distribution battles before they can begin to figure out the business case for using athlete data.

THE MARKET IS PRIMED FOR A DECISIVE SPLIT

The global player tracking market is projected to be worth more than \$8.8 billion by 2025.¹ While the size of this market is up for debate, as of 2019, all four of the major leagues in North America have tested and used a Player Tracking System in a live sports broadcast. FIFA, the Bundesliga, and other international soccer governing bodies have not only tested individual solutions, but also brought the technology in-house and built customized solutions. Technology giants like Apple, Facebook, and Google have validated the potential of this market and recently introduced new athlete data collection solutions.

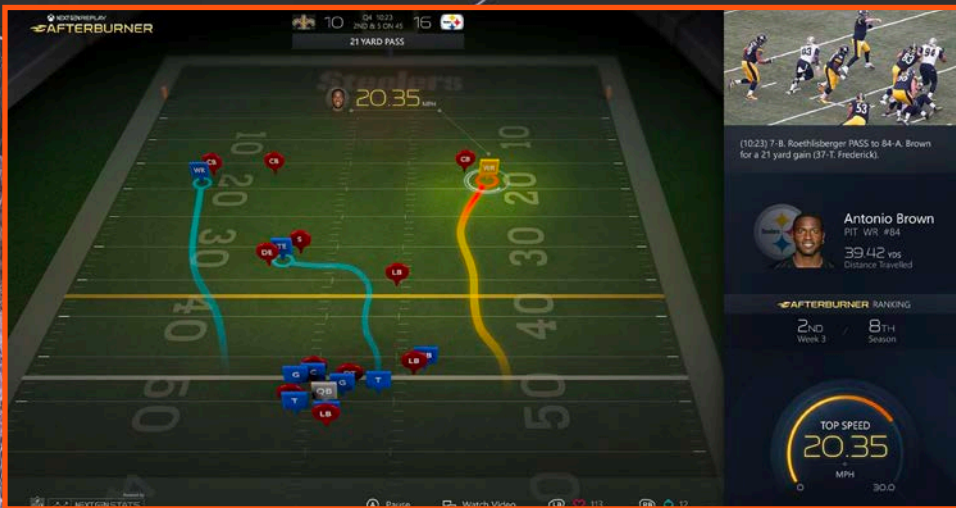
Two distinct markets are emerging in the athlete data space; there is no room left for generalists. Both of these markets will require collection, analysis, and delivery expertise, but suppliers will need to decide which market they're in:

- 1. Human performance.** The human performance market will be a much smaller, science-based market with a few exceptional breakout financial opportunities for companies who bridge the gap from sport performance to health care and warfighter solutions. The Tactical Athlete, that quantifies soldier training and performance, will emerge as an area of great interest, but sales cycles will be long and peer review and academic labs will compete intensely for these grants and budgets.



UFC Performance Institute's "Performance Paradigm": - highlighting the complexity of the sport science aspect of human performance

2. Fan Engagement. Companies that understand how athlete data builds more compelling fan experiences will find significant growth in the coming years, but they must align with large tech and media companies to achieve scale. The immediate opportunities lie with advanced analytics that helps media companies and rights holders justify their rights fees. There's also a rich pool of technology companies like Amazon, Google, IBM, and Microsoft who want to sponsor the development of these consumer-facing solutions.




Advanced Analytics presented via Amazon, and using "Next Gen Stats" powered by AWS

HUMAN PERFORMANCE TECH STILL NEEDS TIME IN THE LAB

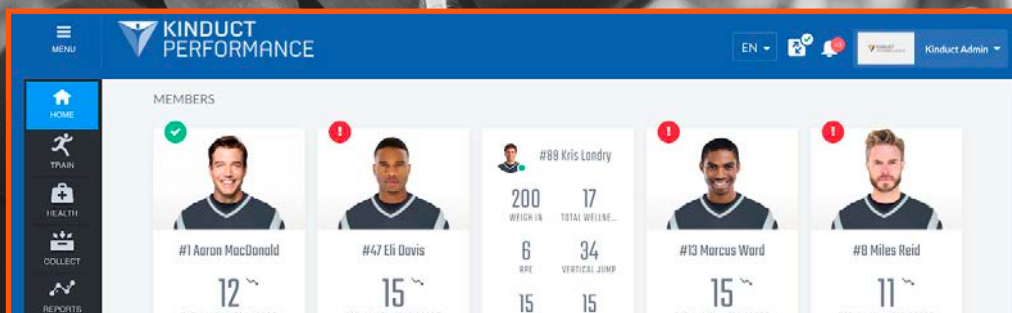
The days of step and calorie counters are gone. The winners in the human performance market will evolve current techniques to distinguish themselves across the stack by demonstrating data rigor and enforcing data standards.

- 1. Human Performance Collection:** The companies who specialize in human performance data collection will be clinically precise in their collection techniques, and will have mastered cross-sport form factor.
- 2. Human Performance Analysis:** The companies who specialize in human performance analysis will run long-term studies to create benchmarks and peer-reviewed analysis before developing algorithms or predicting outcomes.
- 3. Human Performance Delivery:** The companies that choose this path will likely have access to a group of data engineers and data visualization specialists who will customize the delivery of data insights.



[On Kinduct Technologies] “We’re really excited about the MLL as a use case of empowering all the teams to consolidate players with treatment protocols, strength and conditioning practices and at the league level to monitor health and wellness of the sport in a consistent way.”

Colin Keane
Director of Operations, Major League Lacrosse



FAN ENGAGEMENT TECH NEEDS TO FOCUS ON STORYTELLING

For years, sports fans have suffered through technologies that show moving dots on a screen or the live stream of a heart rate. The question: why do fans care? The early adopters of player tracking solutions will tell you, fans care about the stories filled with context and comparisons. For example, the NFL and MLB collect literally hundreds of different live advanced statistics from sensors on the field, players, and cameras. They've distilled these down to a few data points that can be used during broadcasts and discussed by expert commentators. To optimize athlete data-driven storytelling, the industry must master:

- 1. Fan Engagement Collection:** Optical tracking and camera-based systems will prove most effective for fan engagement. These systems are able to track movement and identify key moments in order to provide context for what's happening on the field of play. For now, ignore the heart rate and other biometrics.
- 2. Fan Engagement Analysis:** In the world of athlete data analysis, companies need to start now in order to collect baseline data and make meaningful benchmarks. These companies also need to think about the data transfer time from ingestion to analysis and delivery. These companies will need to optimize networking architectures, leverage edge computing, cloud processing, and tune algorithms.
- 3. Human Performance Delivery:** Companies who focus on fan engagement delivery will introduce and educate the Fluid Fan to the sport. This type of analytics has the ability to demonstrate the elite nature of professional sports, drawing in fans who might not otherwise understand the intricacies of the game. These companies will enable mobile alerts for anomalies and can't miss moments can also be built off this data set and will be in sync with commerce opportunities. They will also feed real-time in-game betting lines, showing the impact of a particular play on the outcome of a game. The faster the data transfer, the longer the bets can stay open, providing the sportsbook operators with tangible ways to increase revenue.

"Player tracking is the foundation that as an industry we need to perfect to make any of the next-generation experience possible, whether it's virtual reality, live sports betting, or augmented reality overlays for in the venue."

Dave Lehanski
SVP, Business Development & Global Partnerships, NHL

FOR THE FLUID FAN™, IT'S ALL ABOUT STORYTELLING

Let's start with the obvious. Sports are about storytelling. It's always been about storytelling. In every great story, audiences are given the information they need to know what has happened, identify the heroes, and foreshadow what could happen next. When fans know the heroes and when they see themselves in the story, new opportunities for fandom arise. For athlete data-driven storytelling to become mainstream, there will need to be consolidation in the technology stack. This story will only come alive with new data sources. Technology providers who specialize in data capture have already begun to partner up and down the technology stack in an effort to provide a full-stack data storytelling solution.



“Fan engagement and technological innovation are at the forefront of everything we do. Using technology to depict exactly how fast, how skilled our game and our players are, enhances the connectivity our fans have with hockey.”

Gary Bettman
Commissioner, NHL

2019 NHL ALL-STAR GAME - SEMIFINAL
CENTRAL 7 PACIFIC 1 1st 1:26 ALL-STAR
WE WANT YOUR FEEDBACK @NHLonNBC #HiTechHockey

PLAYER SPOTLIGHT
PATRICK KANE
SHIFT TIME: 0:44
TOTAL TIME: 3:14
SHIFTS: 4
SPEED (MPH): 13.7 MPH
GAME DISTANCE (FT): 2,936 FT

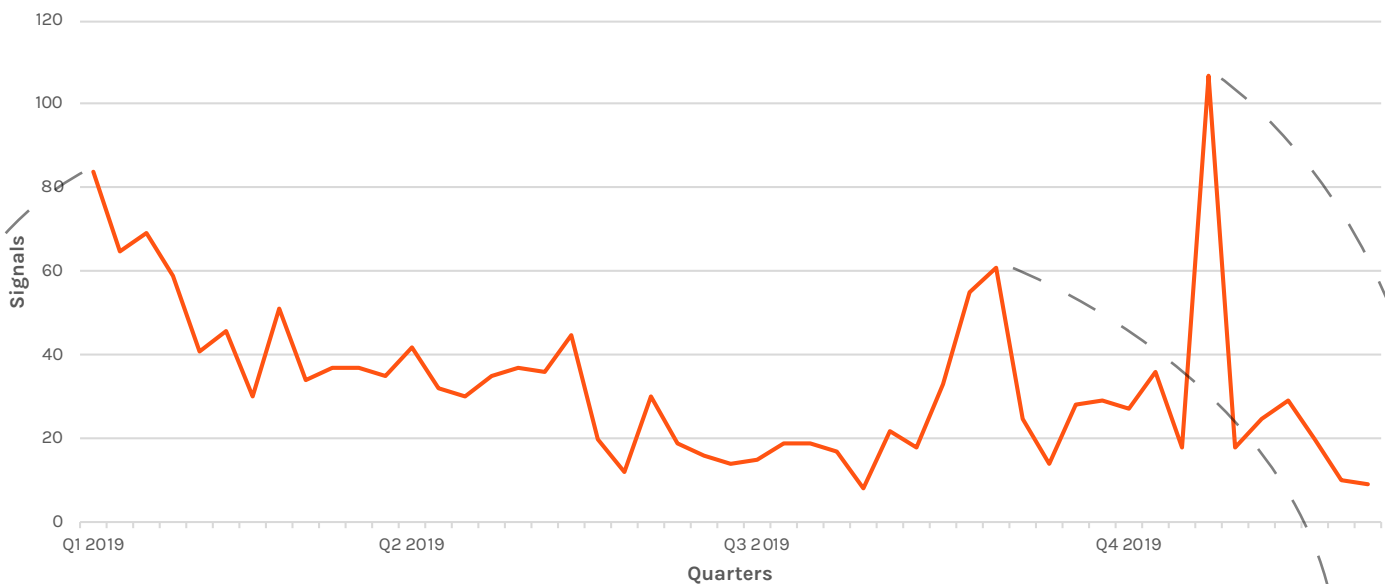
ON THE ICE
CENTRAL: Blake Wheeler (0:44), Patrick Kane (0:44), Miro Heltanen (0:44)
PACIFIC: Brent Burns (0:44), Joe Pavelski (0:44), Johnny Gaudreau (0:44)

WITH OPPORTUNITY COMES URGENCY

The examples of sports media using advanced data analytics are now everywhere. But these solutions have just scratched the surface of what's possible. This data will become a very important driver of industry growth for the following reasons:

1. **Media Rights** - There is mounting pressure to optimize rights fees. Using data to tell stories will help justify the price of these rights.
2. **Sponsorship** - There are new opportunities to capture revenue from technology sponsors, including 5G, cloud computing, artificial intelligence, machine learning, and more. Large technology companies want to demonstrate and communicate their technology chops through the lens of sport.
3. **Legalized Sports Betting** - Gaming and fantasy sports platforms will need differentiated content to win and keep customers. It's a good bet that the platforms with the best live analysis dashboards will win the action of in-game prop bets.

Spikes in "Player Tracking" Business Show an Instable Market Experiencing Growth (2019)³



A. **Alibaba** and **Intel** have announced a partnership to develop an AI-powered 3D athlete tracking technology for the Tokyo 2020 Olympic Games and beyond. This partnership has the potential to apply athlete data for fan engagement with in stream e-commerce opportunities.

B. **Puma** has revealed it's launching its first smart watch partnering with **Fossil**. The new smart watch will come equipped with health features like heart-rate monitoring, while also utilizing Google's operating system and virtual assistant. This may provide a point of entry for Google to enter the wearable market in a low risk way. Polar also made waves this week when it announced that starting in November, FORM Swim Goggles will support its optical heart-rate monitors.

C. **Google** parent company Alphabet acquired **FitBit**. It was their second wearable acquisition of the year. Big tech companies like Google, IBM, Microsoft, and Amazon are in a position to provide analysis on large data sets, but also have consumer facing applications that could be leveraged to monetize athlete data in a direct-to-consumer manner. This makes these companies movement in this market particularly noteworthy.

EARLY STORYTELLING SHOWS POTENTIAL

These business forces have pushed the industry to start piloting different data-rich experiences during live sporting events. We can already enjoy a glimpse of what's possible:

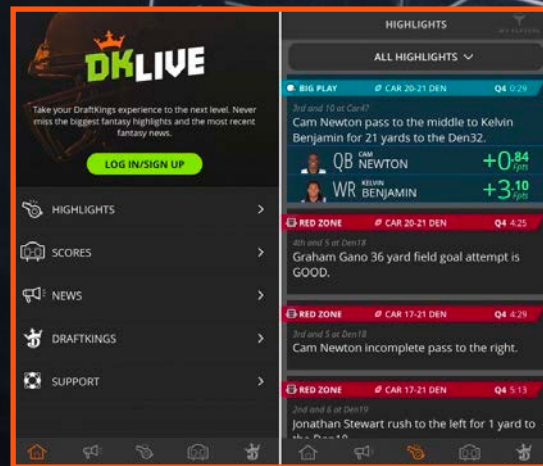
Advanced analytics can help fans feel like an expert in sports.

According to a study by NTT, 34% of participants said that the main reason that they use a second screen when watching sports is to get greater access to data and statistics.²



“Player tracking creates more engagement because it educates people about the sport. The more you understand it the more interesting it becomes.”

Paul Liberman
COO, DraftKings



“We see enormous value to player safety and performance by teaching proper tackling and certifying world-class football coaches. Make no mistake though, this type of data that Atavus ingests and analyzes is an amazing indicator of defensive efficiency and player skill. We think football fans will want this data and it will enhance their appreciation of the game and deepen their engagement.”

Brian Kopp
CEO, Phoenix Sports Partners

Advanced analytics can make media more experiential.

Hawk-Eye's tennis simulator lets fans compare the power of their tennis serves against the world's best on some of the most iconic tennis courts on the circuit. Hawk-Eye has worked with leading tennis sponsors, such as Credit Suisse and Ricoh, to help them engage audiences at the event.

"We felt there was a great opportunity to tell the stories of this wonderful athletic talent and show the moves that set them apart. Our focus also was to put some level of control in the hands of the fans, so they could experience it in their own way versus just a one-way type of experience."

Deborah Curtis
VP of Global Partnerships & Experiential Marketing, American Express



Advanced analytics can make media more social.

Live streaming platforms like Twitch seem to have this figured out. In 2019, the platform announced new features that allow up to four broadcasters to stream together on one screen. With chat features already built-in, this gives Twitch streamers and viewers an added level of social interaction.

"They [sports fans] want to interact with their friends, they want to interact on social media, they want to share highlights, they want to share their opinions. When you add sports betting to that, it's the ultimate interaction. It's the ultimate way to have skin in the game, and it really glues people to that contest in a much different way than ever before."

Scott Butera
President of Interactive Gaming, MGM

Moving Forward with Human Performance and Fan Engagement

A Prescriptive Strategy Developed Exclusively for the Sports Innovation Lab Athlete Data Leadership Board

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New Entrants Will Break this Cycle of Specialization

There is plenty of evidence of market consolidation and massive technology companies are showing strategic interest in human performance data. These companies will make a strong play for the direct-to-consumer market and change the business model around collecting, analyzing, and delivering athlete data.

1. Large companies are accelerating consolidation. Amazon is filing patents and contracts to

performance data will lead to data demand. The more consumers learn about their own bodies, the more they will want to compare their performance with elite athletes. Aspiring basketball players will want to know if their vertical jump is similar to LeBron James, soccer players will want to know if their penalty kick accuracy compares to Messi, and hockey players will want to know if they skate as fast as Kendall Coyne-Schofield. This is not dissimilar to trends we've seen in DIY content (cooking, home improvement), user-generated media production (tiktok, instagram), and

1. Athletes will start sharing their training data to drive merchandise. Athletes know that their brand equates to jersey sales and sponsorship deals. Expect apparel contracts to start including access to off-field biometric data. Expect video game companies to pay a premium for athlete likeness that includes sleep, training, and nutrition data.

The Professional Squash Association (PSA)'s agreement (from 2018): the league will record and provide athlete biometric data collected by cameras and sensors from Sports Data Labs to create a new revenue stream. All parties involved - the PSA, the league, and the athletes will

These pages were produced exclusively for the members of the 2019 Athlete Data Leadership Board.

Sports Innovation Lab facilitates Leadership Boards across the following topic areas:

Smart Venue

Immersive Media

Next-Gen Sponsorship

Athlete-Driven Media

**To learn more about our Leadership Board program, contact us at:
info@sportsilab.com**

3. Athlete data will be incorporated more deeply into fitness equipment displays. Instead of thirty-second endorsement commercials, athletes will be hired to incorporate their training data into Peloton-style training courses, video workout series, and youth sport digital platforms like Hudl. All of this data will help fans understand what world-class performance looks like, from sleep and recovery to nutrition and hydration. As equipment companies and gyms sign exclusive deals, fans will look for products and services that unlock creative new workouts. Lifefitness, Gold's Gym, Orange Theory, will do more than measure the biometrics of the class; they will license official elite athlete data to provide a unique training experience.

Case Study: Peloton and Apple use athlete data to create unique training experiences.

impressive "player and ball tracking vanity metrics". Athletes will use filters and short-form videos to share training programs, annotate nutrition and meal photos.

Case Study: Playr: compare your training and stats to the pros who wear Catapult devices.

Near future: Athletes will compare "vanity metrics benchmarking" - doing the same thing consistently for a few years to show progress and improvement of speed, accuracy, power, and endurance. They'll look to back that up with playful cross-sport trash-talking.

Soon after: As fans react, follow, and eventually pay to subscribe to athlete driven media, these expect these vanity metrics to be enriched or augmented with off-field information. The subscription model will be used to track sleep, nutrition, and recovery

without this data will be left on the sidelines. Find partners willing to develop these data sets with you so you share the risk and the costs of any hardware deployments.

2. Don't fight too hard over data ownership and empower athletes. While this sounds counterintuitive, legal and privacy battles can dramatically slow progress in this space. Find business arrangements that align business incentives. For better or worse, these partnerships matter a lot to both parties. The NHL is now relying heavily on SMT to deliver player and puck tracking solutions. The NFL is linked to Zebra Technologies, and STATSport will be vital to U.S. soccer player tracking. Most major professional sports leagues now develop social collateral specifically for athletes to share and post on publicly after workouts.

Case Study: Peloton and Apple use athlete data to create unique training experiences.

DON'T WAIT TO INNOVATE

For human performance specialists, the best solutions are only just emerging from university labs, and the various stakeholders are still negotiating around ownership and use of the data. For sports media, monetization of human performance data is still largely unproven, and there is no clear business model for this data yet. Early adopters are split on the value this data provides for athlete health and wellness. This is less an indication of product readiness, and more an indication the industry still doesn't agree on what data to collect and use. The lack of clarity on use, access, and potential upside keeps athlete and team compliance low.

Even though the business model for human performance data is elusive, properties can't afford to wait. They must start now in order to understand which collection tools are best for their needs, familiarize their organizations with this data, and build a data set that can be used in the future when goals are more clear.

It is impossible to build algorithms without large datasets. These kinds of algorithms will ultimately power platforms that identify injury risk and correct imbalances for human performance stakeholders. Different algorithms built on similar data sets will power new media and fan engagement opportunities for media stakeholders.

Organizations without athlete data will likely pay a high price to access third-party data in the future.

Experimentation is never easy. Many stakeholders, each with differing goals, must collaborate to build the new stack. As partners come together, they should look to experiment in lower-risk environments. Developmental leagues, in all-star games, and in minor league games, will be the sandbox leaders use to perfect their solutions and build a lead in this emerging industry.

ABOUT THIS REPORT

To develop this research, Sports Innovation Lab and its Athlete Data Leadership Board spent 2019 reviewing market behavior, evaluating vendors, and conducting interviews with market experts.

The Board met every three months to review market analysis created by Sports Innovation Lab's proprietary data, discuss and identify trends, and to share best practices.

In addition to the work of the Leadership Board, the Sports Innovation Lab also conducted interviews with experts from across the sports industry.

This report represents the knowledge collected and shared by the board members, and the responses from additional interviews in conjunction with extant research into the field of athlete data conducted by the Sports Innovation Lab.

2019 Athlete Data Leadership Board Members:

USC - Dr. Leslie Saxon, Executive Director of the Center for Body Computing, Co-Chair

Atavus - Brian Kopp, Executive Chairman

Chicago Cubs - Bobby Basham, Director Player Development

DraftKings - Paul Liberman, Co-Founder & COO

Kinduct Technologies - Travis McDonough, CEO

MGM - Scott Butera, President of Interactive Gaming

NFL - Jay Reid, Senior Director, Football Operations Technology Strategy

NHL - Dave Lehanski, SVP, Business Development & Global Partnerships

Octagon - Jeremy Aisenberg, VP, Strategic Initiatives

Orreco - Dr. Brian Moore, Co-Founder & CEO

Orig3n - Kate Blanchard, COO

Teamworks - Rachel Classi, VP Marketing

UFC - Lawrence Epstein, COO

Whoop - Will Ahmed, Founder & CEO

Additional Interviews:

Beyond Sports

Booz Allen

ChyronHego

Figur8

Immersiv.io

Korey Stringer Institute

ShotTracker

Sparta Science

Sportradar

Sports Data Labs

Vizrt

¹"Insights into Sports Performance Tracking's Emergence in the Player Tracking Market." BULLPEN. 2019.

²Balderston, Michael. "AI Boosts Viewer Engagement For Sports Broadcasts, Per NTT." TV Technology. 2019.



Sports Innovation Lab empowers sports brands to create breakthrough fan experiences through technology.

Sports Innovation Lab is leading a sports research revolution. We exist to educate our clients on the technological possibilities for their brand and how to ultimately drive value to the end consumer: the Fluid Fan™. We inspire brands to create bold fan experiences through data-driven technology insights and industry-leading research.

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