Data Driven - The Business of Managing Performance
Endurance Sportscar Racing
Sanctioned by
INTERNATIONAL MOTOR SPORTS ASSOCIATION
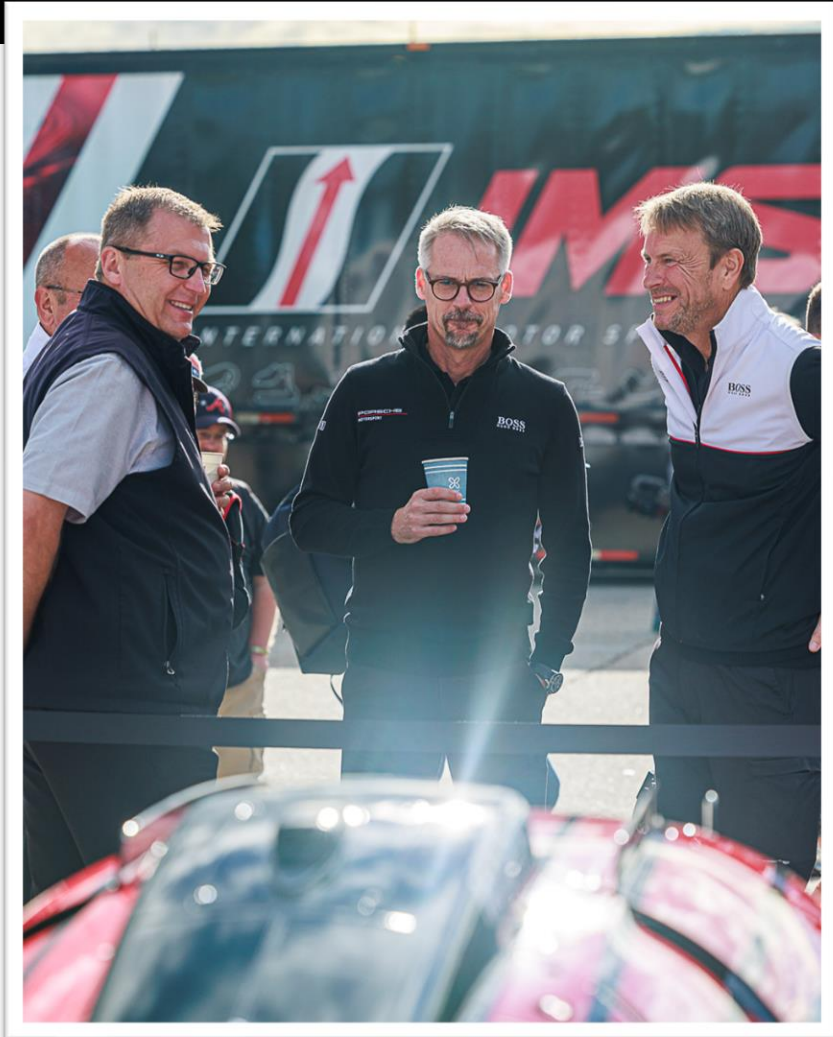
INTERNATIONAL MOTOR SPORTS ASSOCIATION
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IMSA

DATA DRIVEN
The Business of Managing Performance

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> WHEN "**DRIVERS, START YOUR ENGINES!**" SOUNDS ACROSS DAYTONA INTERNATIONAL SPEEDWAY, AND THE GREEN FLAG DROPS AT 14:40 ON JANUARY 28TH; NOT ONLY WILL THIS MOMENT SIGNAL THE START OF NORTH AMERICA'S MOST ICONIC SPORTS CAR RACE, BUT IT'LL ALSO MARK THE CULMINATION OF MANY YEARS OF WORK BY OUR TEAMS, USING ADVANCED TECHNOLOGY TO BRING OUR VISION FOR THE ULTIMATE EXPRESSION OF OEM's CARS TO THE GRID.

Data has become the engine for competitive sports car racing, increasingly pervading the complete lifecycle, from design, through production, to race day performance and the fan experience.

During every lap, many onboard sensors collect ~150 unique measurements to help the technical teams refine aerodynamics, performance, fuel consumption, tire degradation, and handling. The IMSA platform, being a 'balance of performance series, enables the closest competition on the track, so off the track, we must provide ALL our competitors with the right information at the right time and deliver an immersive digital experience for our fans whether at the track or watching remotely.

All aspects of sports car racing are changing rapidly and so is the business of managing performance; how we extract value from vast volumes of data we collate requires IMSA to embark on our own digital transformation, resulting in new partnership opportunities for technology companies.

The IMSA platform represents an industry-changing initiative – driving global convergence in endurance sports car racing and providing IMSA Corporate Partners, automobile manufacturer partners, and other stakeholders with both a technology and sustainability-driven marketing platform.

On the following pages, you'll read about our data journey

John

John Doonan
President, International Motor Sports Association

" SCULPTURED. STYLIZED. SPEED.

Realizing IMSA's vision for the future of Sports Car racing involved bringing automotive manufacturers and chassis designers together with advanced technology providers and partnerships with ACO to create a collation of the willing. Our goal; is to design and build the ultimate sports car for sustainable, competitive, cost-effective endurance racing that entertains our fans.

IMSA's Data Journey began many years ago, extracting maximal potential from technology and data during the design phase of the lifecycle, ensuring equitable aerodynamic performance (Size & Shape), and managing compliance with regulatory controls (Power & Weight) while allowing for flexibility in styling.

This effort, no small undertaking, bought together previously disparate data into a single source (a data lake), allowing all disciplines (Styling, Aerodynamics, Engineering, and Fluid Dynamics to name a few) to have a common view of the forces driving performance while staying compliant with the stipulated regulations.

Advanced cloud technology provides us with the computational power needed to close the gap between digital modeling and physical realities.

Shaping these new GTP cars necessitated investment in talented personnel and new technology to form Data Science and Data Engineering faculties. Decisions are ALL data-driven; our GTP cars are essentially IOT devices with 100's of sensors acquiring data, feeding models, and producing automated maps that are all geared towards shaping performance characteristics.
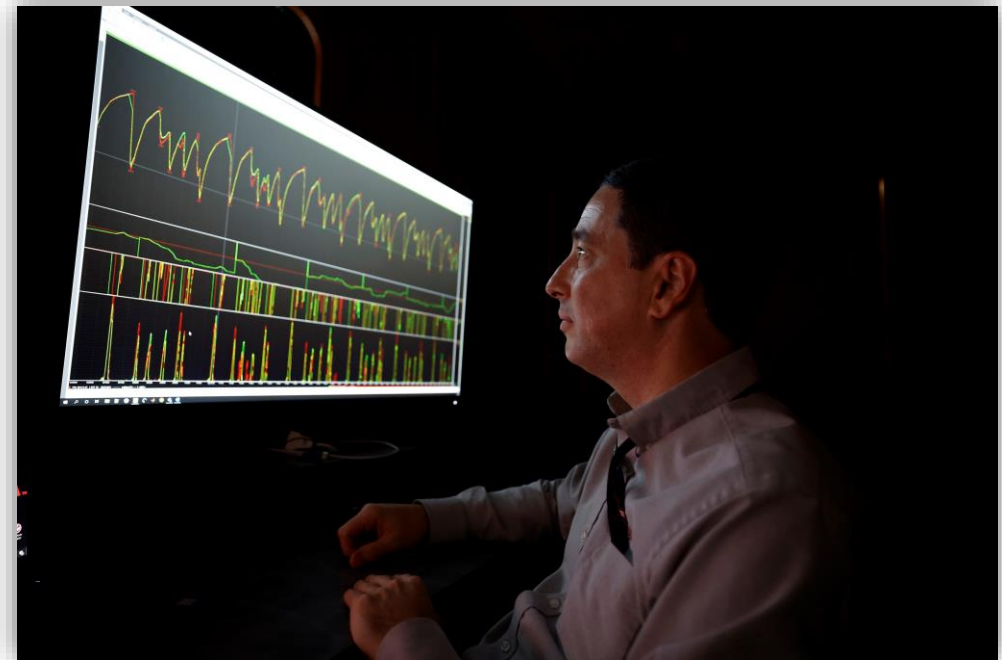
"We strive to ensure every single bit of data captured is utilized by IMSA and all our partners, to manage performance, ensure compliance, and to entertain fans."

Matt Kurdock, Technical Director,

" REAL-TIME DECISION MAKING

During every lap, millions of data points are collated, reasoned over, and insights provided back to the crew and driver in near real-time. It's a sport where 1/100th of a second can mean the difference between success and failure. Currently, our estimate suggests we'll collate approximately 2TB of data during Rolex 24 at Daytona; the amount of data we collect is growing exponentially.

Sensors (IOT devices) are deployed on the car to acquire telemetry (raw data), which is transmitted over cellular to the cloud, and intelligence is applied (AI, ML); the resulting analysis & insights are consumed by engineers on the pit wall.

Our systems are triangulating the data points to create a holistic view of car performance from several traditional sources: Throttle, RPM, MPH, Braking, Acceleration, Gear, Boost, Track, position, and Fuel use. Our digital transformation continues as we look to reason over more and more data points; Hybrid - under power, regenerating, Hybrid battery charge level etc.

Intelligence is not just about interpreting the newly collected data but overlaying historical data (Red Flag impacts, weather patterns) to bring smart insights, predictive analyses, and recommendations to inform the pit wall and then, in turn, the cockpit on key decisions (when to pit or not, when to push, or conserve, etc..).

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"Our data journey goal is the seamless integration of technology—cloud, AI, IoT, and analytics – coming together in dynamic ways to provide deeper insights to designers, engineers, drivers, race control, timing and scoring, and ultimately into the cockpit"

David McSpadden, Senior Director, Systems,

" EXPERIENCE MATTERS

Extracting the power of the vast arrays of IMSA Race data to provide predictive insights & recommendations to our fans - via IMSA Fan Apps and via broadcast overlays - brings them closer to the action, increasing their connection with their favorite teams and drivers.

IMSA System Teams are continually working through how AI and machine learning can be deployed to deliver enhanced real-time insights and predictive analytics to our fans, providing an immersive experience to help them compare lap performance against tire wear and fuel consumption to assess pit stop strategies, all integrated with historical data including weather patterns, the impact of incidents, etc.

Our data velocity has picked up quite substantially in the past few years – the growth is exponential; we are developing new and exciting ways to unlock the entertainment value of all this rich data.

With the introduction of new bio-fuels and tires with a higher percentage of renewable material, new race strategies will emerge, such as the increased drama of double-stinting.

Our fans are well-informed and very knowledgeable; they have growing demands that require new thinking to provide new offerings.

Show me the data!

"Fans are the lifeblood of our sport. By pulling together rich data streams in real time, we can create compelling applications and broadcast overlays, resulting in an immersive experience that gets our fans closer to the action.

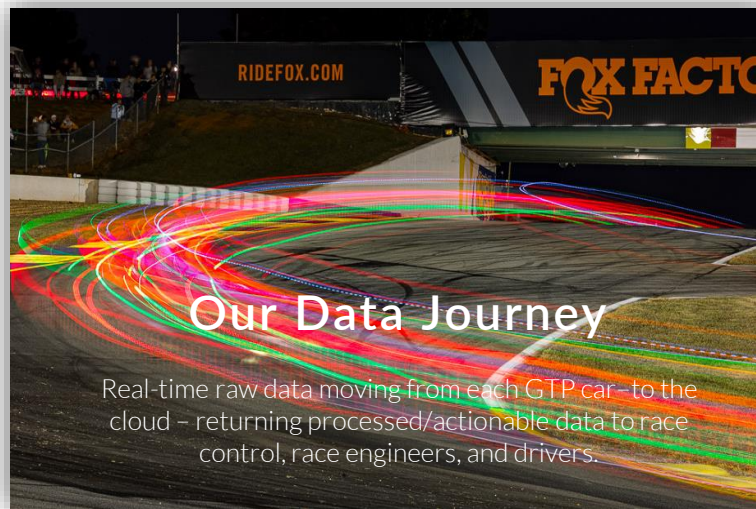**David McSpadden**, Senior Director, Systems,

Sustainable Competition - Driven by Data

North America's First Hybrid-Electrified Race Car
New Technology Leadership

Shaping the Future

Advanced cloud technology provides the computational power needed to bridge the gap between digital modeling (CFD) and physical realities. To accelerate design & build while managing compliance with regulations,

Our Data Journey

Real-time raw data moving from each GTP car—to the cloud – returning processed/actionable data to race control, race engineers, and drivers.

Modern Fan Experience

Enhanced experience, with predictive analytics (strategy for driver changes, fuel n tire stops) delivered to fans viewing on NBC Sports, at-track, via IMSA APP, and IMSA.com streaming

The IMSA platform represents an industry-changing initiative – driving global convergence in endurance sports car racing and providing IMSA Corporate Partners, automobile manufacturer partners, and other stakeholders with both a technology and sustainability-driven marketing platform.

WWW.IMSA.COM

Executive Summary

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All aspects of sports car racing are changing rapidly, and so is the business of managing performance; how we extract value from vast volumes of data we collate has required IMSA to embark on our own digital transformation and has resulted in new partnership opportunities for technology companies.

IMSA is transforming to meet new demands; we operate at the intersection of advanced technology and sustainable competitive racing.

John Doonan
President, International Motor Sports Association