
NTT
800m
12 million
The world's largest connected stadium
Revolutionizing experiences and building connections with data at the core

Foreword

The ability to adapt and change has been at the heart of our seven-year partnership with Amaury Sport Organisation (A.S.O.). We're helping to constantly innovate the Tour de France, an event millions of passionate fans from around the world eagerly anticipate. Each year the stakes increase as we create new ways to reach and engage more people in new and exciting ways.

This year sees the creation of the world's largest connected stadium, a concept unique to the Tour de France. Spanning a highly dynamic environment, we're bringing together over 3,000 km of people, processes and technology through a network fabric.

That is connecting edge devices and things, connecting edge to the cloud and then into and across different clouds. This creates millions of data points, which are then collected and brought to life through stunning, insightful visualizations across a range of platforms. Through constant innovation, we're helping to power a smarter Tour de France, enabling A.S.O. to build deeper connections with fans in new and exciting ways.

Peter Gray,
Senior Vice President,
Advanced Technology Group,
Sport at NTT Ltd.

Spanning a highly dynamic environment, we're bringing together over 3,000km people, processes and technology through a network fabric.

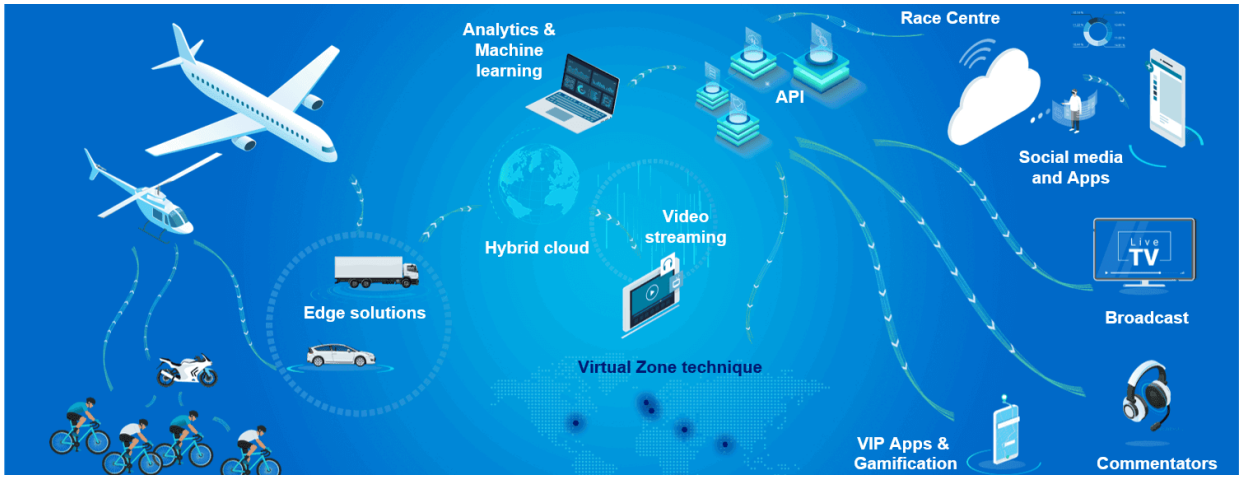

From the first ever Grand Départ in Montgeron

Data at the core, enabled by cloud

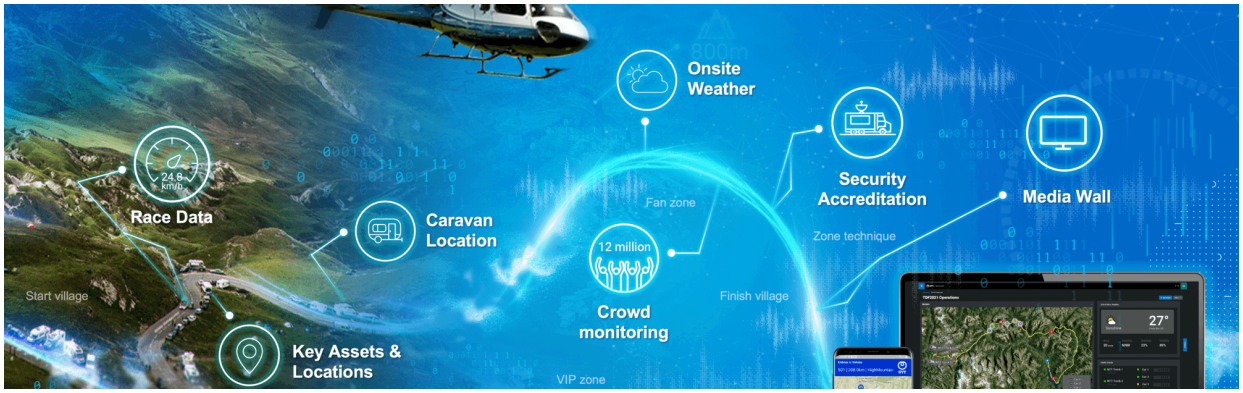
With such a unique proposition, A.S.O.'s technology requirements drive us to continually innovate the Tour de France. But importantly taking the lessons learned from our vast experience across many clients and sectors. Whether it's creating the world's largest connected stadium, or implementing digital transformation projects across an array of business functions, success is determined by achieving fundamental outcomes.

The digitization of the Tour de France initially began in 2015 by capturing data from the cyclists to provide real-time updates. Now, that process has moved on considerably to digitizing the entire event to create the world's largest connected stadium. It's effectively a digital twin of the Tour de France, enabled through IoT, Edge Compute, Managed Network and Cloud Services and NTT Smart Platform. No easy feat when you consider the complexity of the race.

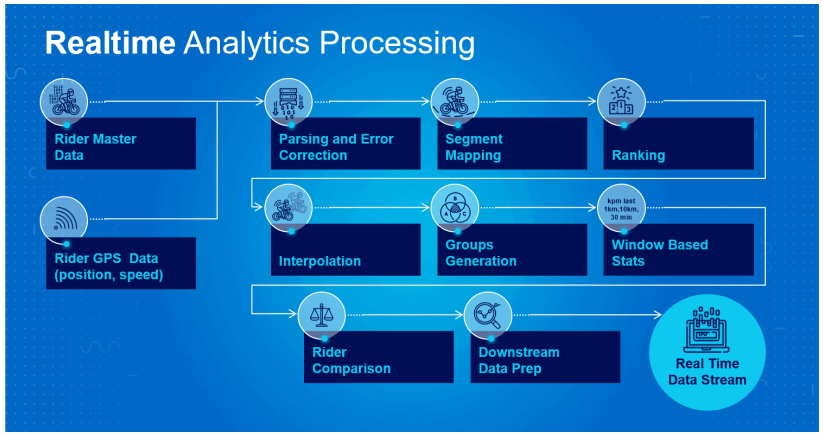
Think of your own organization and the ability to securely capture data, across the assets it holds, many of which are static - buildings, workstations, equipment and so on. Now consider how in the age of distributed working, you need to think about how and where your people work from, along with the various endpoints outside your traditional perimeter.



From sensor to screen – the data journey behind the fan experience



Creating a digital twin of the world's largest stadium to support event operations and future fan services

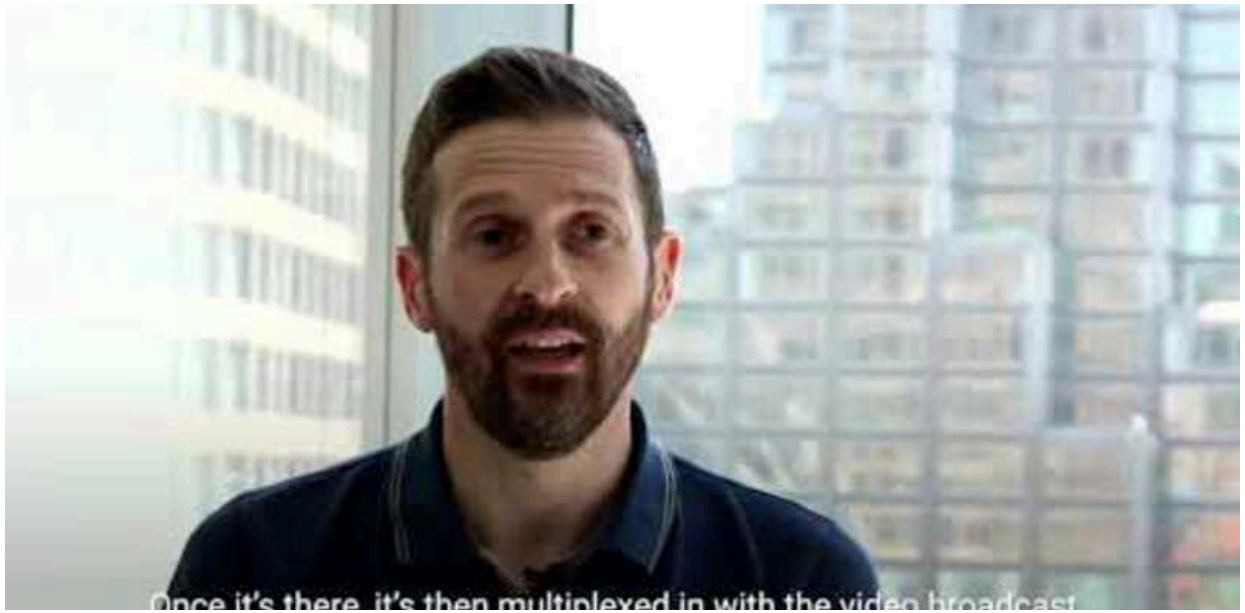


Real-time analytics processing

Globally distributed workforce

Now consider moving this entire operation to a different location every day, securely – and while the world is watching. This is what A.S.O. manages each day the Tour de France is in progress; a unique proposition that connects 3,400km of people, operations and assets. It's a highly dynamic and changing environment that requires access to real-time information to ensure a continuous and smooth operation, resulting in delighted fans and more informed broadcast channels.

In creating the event's digital twin, we're using a broad range of IoT sensors, integrated into a common platform and mapped against a geo-location model of the stage.



In creating the event's digital twin, we're using a broad range of IoT sensors, integrated into a common platform and mapped against a geo-location model of the stage. This enables real-time visibility of key locations and assets, as well as monitoring of crowd density or congestion, COVID-19 contact tracing, and real time updates of caravan and race arrival times.

In addition, we use analytical processing at the edge to provide real time race data back to the official race vehicles.

In addition, we use analytical processing at the edge to provide real time race data back to the official race vehicles. This delivers a live overview of the race situation, even where mobile connectivity is not available, if for example the route happens to be traveling through a remote area or higher elevation, such as a mountain stage. The complexity of the environment only adds to the challenges A.S.O. has to manage each day and why creating a digital twin of the event will help ensure the continuity and resilience of the race.

Much as you would build a holistic view of your own organization and its various components, the Tour de France through our partnership with A.S.O. is very much on a journey towards building a real time view of the entire event as it progresses. This is presented through an operations dashboard and event applications for people working on the event to access, no matter where they are.

Edge to the cloud

Cloud facilitates the demand to be better connected, no matter where the race is staged and no matter where computing, applications and users reside. We enable A.S.O. to connect within the cloud by providing a truly hybrid environment of physical and virtual servers, containers and serverless functions for different workloads. This is all monitored using our NTT Services Portal, and automated Infrastructure as Code deployment. In 2021 we're further enhancing this through the implementation of an AIOps platform, ensuring far deeper insight into the health of the infrastructure and platform - all in real-time.

Creating a digital twin of the race also means more 'things' become connected (devices, vehicles, tablets and phones) as well as more applications and platforms accessing services hosted in the cloud (public, private or hybrid).

Our Managed Network Services provide a software defined network to ensure everything stays connected. While the Tour de France platforms are monitored by our Managed Security Services. This provides real time threat detection and management, while security audits and penetration testing ensure the security of our applications.

In making operational information available, we're able to help A.S.O. simplify their operations in what is a very complex environment. Providing a highly dynamic view of all the events assets, locations and monitoring capabilities also helps form the basis for future fan services, which will ultimately be embedded into the mobile app for future editions. Whatever the goals, for A.S.O., data will be at the core. That's understanding where it lies, how to gather it and then how to use it effectively to create better experiences, be it across fans, the media and cycling teams.

Many of us appreciate how challenging it can be to have a holistic view of a static entity. Building the infrastructure for a continuously moving operation where dynamic decision-making is critical, is an entirely different ball game. Or should that be an entirely different race?!

Learn more

TECH INFOGRAPHIC

TOUR DE FRANCE VIRTUAL SPORTS STUDIO

TECH WHITE PAPER


NTT
8.2
million
Transform through
innovation

A recurring theme for many organizations as they sought to navigate their way through the pandemic was how to ensure their customers' needs and requirements were met.

Yet equally as, if not more important, was how to reach new audiences and exploit technology to reach new audiences and open up new revenue streams in light of the ongoing restrictions.

It's no different for A.S.O. – who own and design top international sporting events around the world. They must continually innovate their organization and bring about opportunities as part of delivering the world's largest connected stadium. Technology is vital in being able to help A.S.O. tackle the challenges brought on by the pandemic. Organizational and technological innovation needs to be accelerated with the same speed that fans and employees expect from their mobile and cloud-based applications.

Technology is vital in being able to help A.S.O. tackle the challenges brought on by the pandemic.

We're helping to elevate the role technology plays across the organization, building flexibility into systems and architectures and using platforms, reusable components and APIs to ensure bold strategic initiatives are possible and will support what needs to be a highly agile business.

Implementing proactive strategies also enables adaptability. It's about understanding how to triangulate new technologies, market changes and organizational capabilities and then facilitate the right conversations to bring about fast, effective change in response to fan needs. We enable this for A.S.O. through our ability to digitize the entire Tour de France event; a critical requirement given the volatile nature of change that occurs within the race.

> **"The world has changed significantly recently, meaning organizations have been forced to adopt proactive strategies to anticipate disruption."**

In providing event insights, rich analytics and intelligent digital solutions we enable quicker, more informed decisions to be made. For example, as happens in business across the globe, changes occur without warning, which in A.S.O.'s case could be mid-race. Our ability to provide real-time information around severe weather means information gets into the hands of those who need it. This ensures the safety and integrity of the Tour de France and ultimately enables a more seamless experience for those at the event.That integrity is paramount as part of making the Tour de France is COVID-19 safe. Senior leaders across global organizations are considering how to bring back their people into a safe work environment. It's a challenge we solved at NTT as part of moving to a digital workplace model where everything is virtualized and global.

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Our own workforce uses wayfinding technology to guide them via the safest, most efficient route to a pre-booked desk. At the Tour de France, we've deployed crowd monitoring applications for organizers to monitor the volume of fans in any given location. But more importantly, so fans can enjoy live sport safely.

The world has changed significantly recently, meaning organizations have been forced to adopt proactive strategies to anticipate disruption. There is no steady state for the foreseeable future. For A.S.O and the Tour de France this is also true, which means transforming the business of cycling through innovation to adapt and grow with change.

Learn more

- BUSINESS OUTCOMES THOUGHT LEADERSHIP
- BUSINESS INFOGRAPHIC
- TOUR DE FRANCE VIRTUAL SPORTS STUDIO

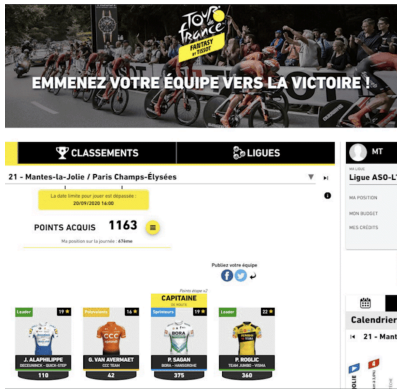
Dynamic, richer fan experiences

> **Since 2015, we've brought a whole host of digital enhancements to the event to create the best 'connected fan' experiences.**

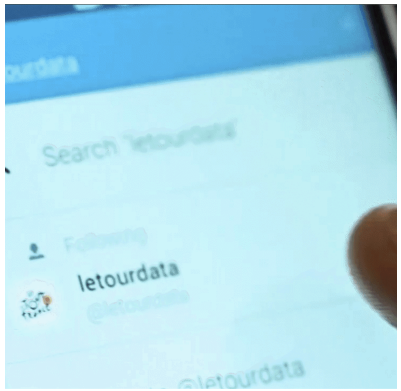
Our partnership with A.S.O. is helping the Tour de France shape the future of fan engagement. It's a unique proposition. A constantly shifting event across what is effectively 3,400km of 'connected' people, places and things, all coming together to form the world's largest connected stadium. As much as organizations want to provide deeper, richer experiences for both customers and employees, so too does A.S.O., as part of delivering the Tour de France to millions of fans around the world and at the race.

Since 2015, we've brought a whole host of digital enhancements to the event to create the best 'connected fan' experiences. This year is no different. New insights, new ways of visualizing data and new predictions have been created and are accessible, delivering a data-driven experience across any device, wherever you are in the world.

As part of scaling the Tour de France to reach audiences and open up new revenue streams, we've helped A.S.O. develop a whole host of platforms to engage with multiple audiences, in multiple ways. This includes: Race Center, the official live tracking site; LeTourData, data-driven storytelling and insight into the race; Media wall, deep data and consolidated insights from multiple sources at the edge, presented in a visually stunning way; 3D Tracker, an AR app that provides 3D views of the stages; Fantasy Game, which integrates data insights and machine learning to enhance the gamification of the Tour de France; as well as broadcast and social media.



Fantasy Game



Race Center

Media Wall

3D Race Tracker

LeTourData

In a world that demands increased immediacy, speed and decision-making, enhanced visualizations and graphics of the race are a priority and delivered via NTT Disruption for television, social media and the NTT Media Wall. Leveraging their analytical, creative and design skills takes our visualizations to the next level and creates more engaging fan experiences.

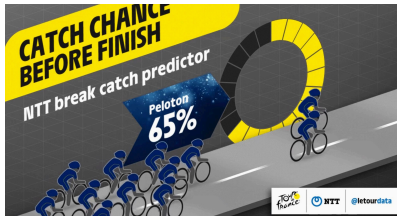
Similar to how global organizations thrive on rich insights to make better decisions, we're continuing to innovate LeTourData for those that truly love to get into the depths of cycling analysis and predictions. This near-live, data-led storytelling social channel provides further insights into the athletes and the race, with stories published on broadcast and social media to enhance the viewing experience.

Additionally, the NTT Media Wall provides real-time, dynamic content and data insights throughout the race, all delivered through the unique NTT Services Portal. When it's not producing data about the Tour de France, the Services Portal is where our clients access and engage with data about their NTT services and solutions. Much like cycling data, it gives them a near real-time view of the status and performance of those services and enables them to make better decisions, just as A.S.O. can about the race.

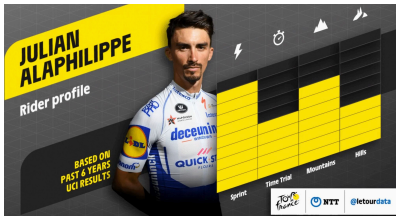
Working through our customer experience business, we've helped design and architect the technology platform to enable the Tour de France Club, as well as making our augmented reality (AR) app exclusively available to Tour de France Club members. This exclusive club provides access to enhanced features and content as part of a global community.

While data is a vital component of fan engagement, it's how we connect data to people to create human experiences that will indicate the success and continued innovation of the Tour de France.

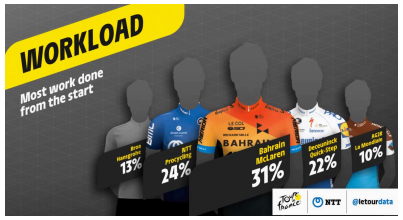
Stage favourites



Break-catch predictions



Rider profiles 2.0



Workload analysis

Time-trial analysis

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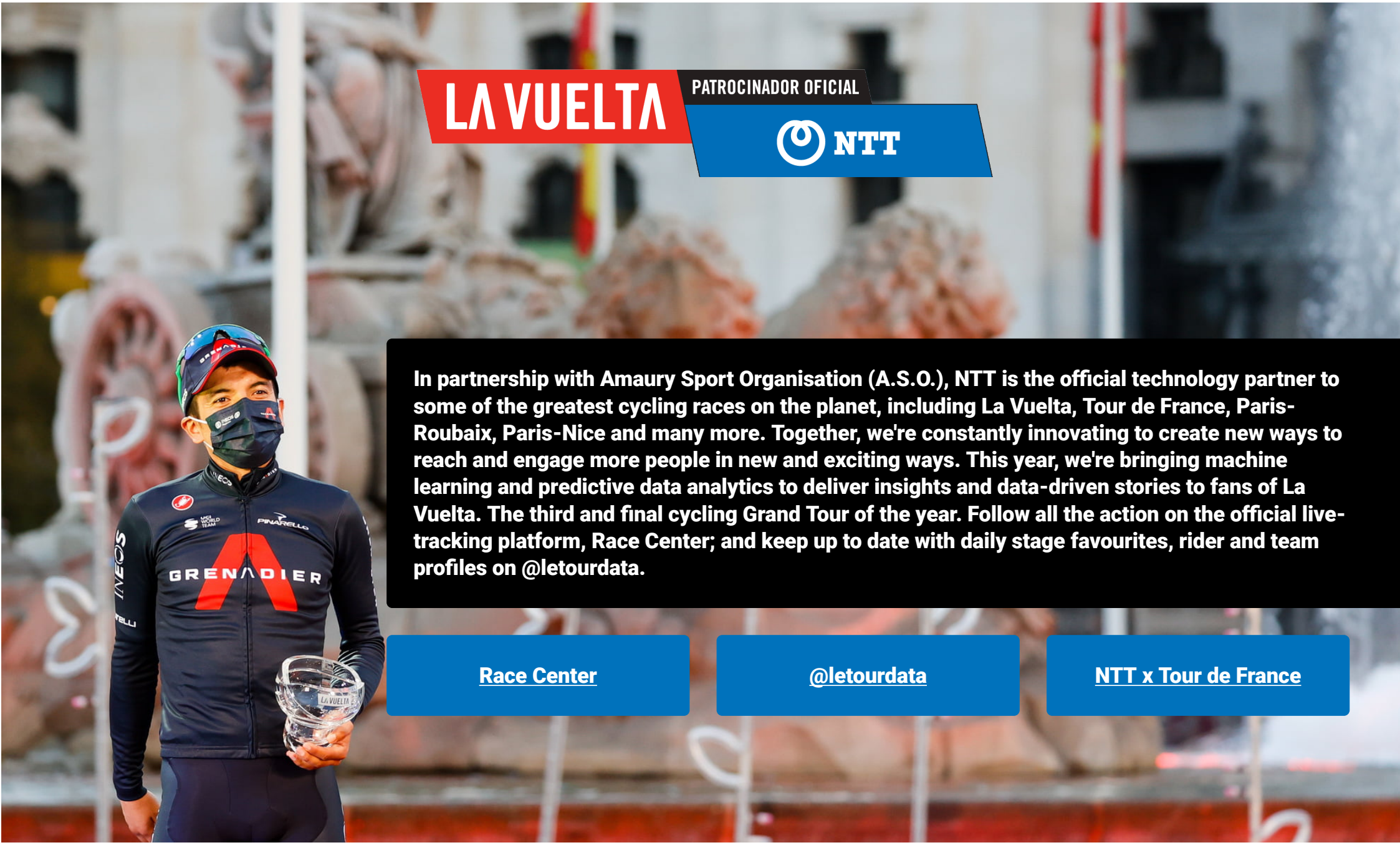
CYCLING FAN INFOGRAPHIC

TOUR DE FRANCE VIRTUAL SPORTS STUDIO


NTT
La Vuelta
Machine learning, predictive analytics and
fan engagement at the final Grand Tour
JUMBO VISMA
Carrefour
INEOS GRENADIER
LA VUELTA 20
MADRID



In partnership with Amaury Sport Organisation (A.S.O.), NTT is the official technology partner to some of the greatest cycling races on the planet, including La Vuelta, Tour de France, Paris-Roubaix, Paris-Nice and many more. Together, we're constantly innovating to create new ways to reach and engage more people in new and exciting ways. This year, we're bringing machine learning and predictive data analytics to deliver insights and data-driven stories to fans of La Vuelta. The third and final cycling Grand Tour of the year. Follow all the action on the official live-tracking platform, Race Center; and keep up to date with daily stage favourites, rider and team profiles on @letourdata.

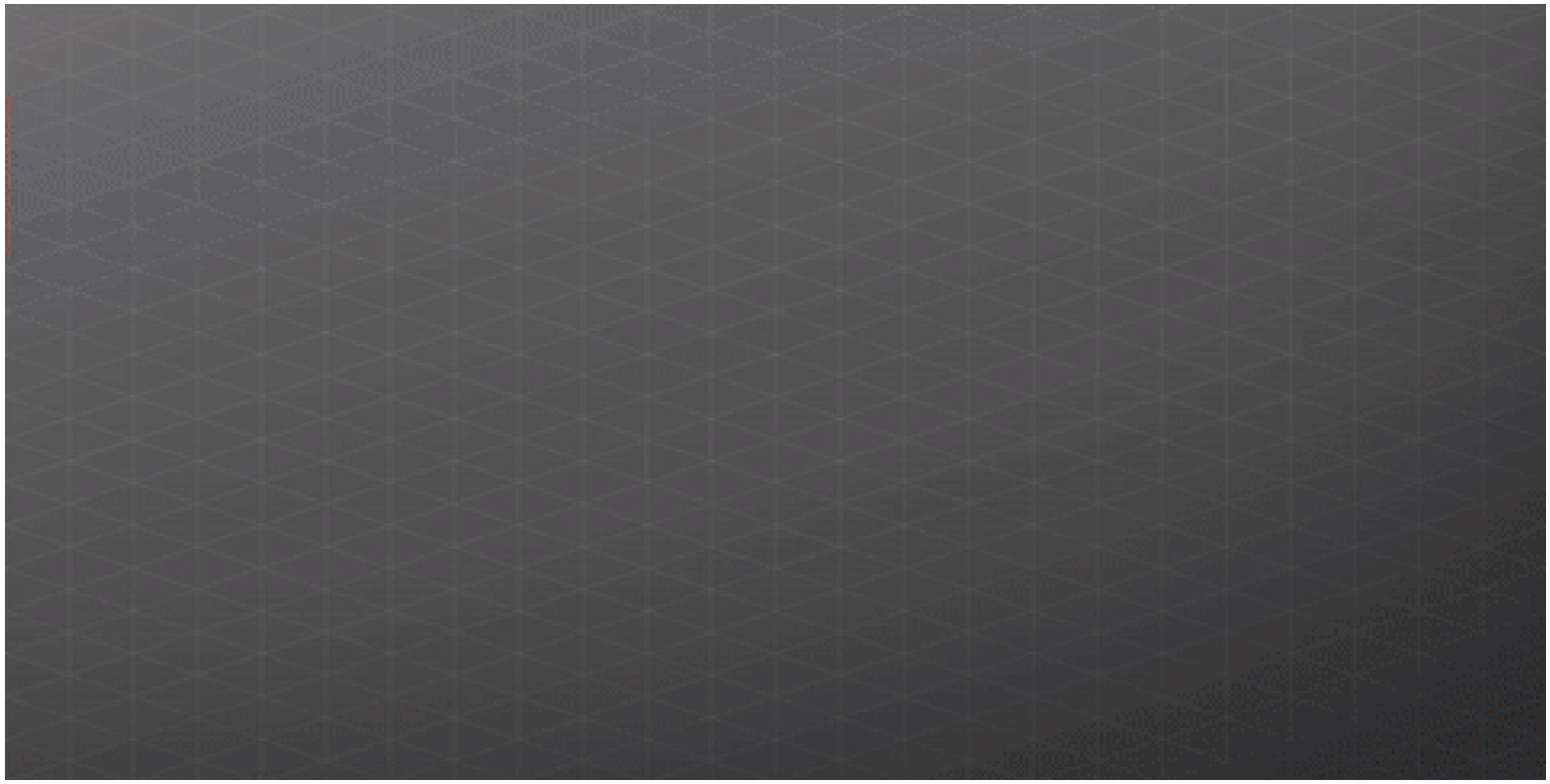
Race Center

@letourdata

NTT x Tour de France

Machine learning to predict race and stage favourites

Building on our core analytics platform and algorithms, we use a combination of telemetry data, race results, rider data, course information and conditions data to predict race outcomes. Our #NTTPredictor can determine which riders are likely to do well on a given stage based on their profile, results and the nature of the day's route.



Who will win La Vuelta in 2021?

- Adam Yates
- Primož Roglič
- Egan Bernal
- Someone else

SEE RESULTS —

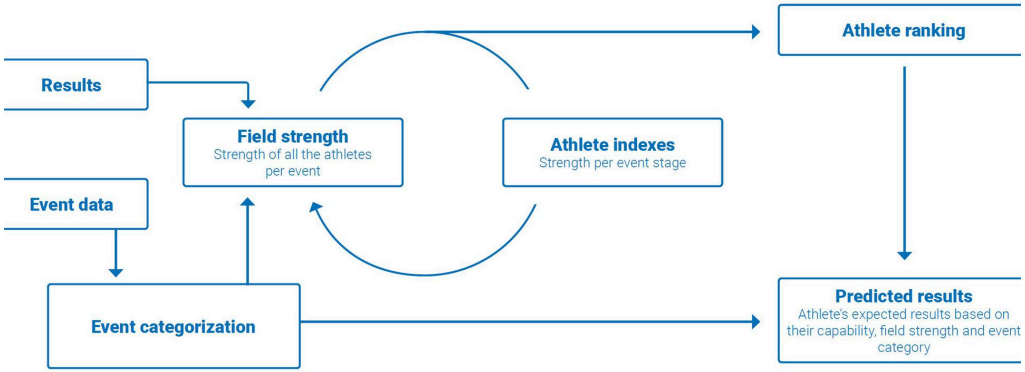
LEARN MORE IN OUR TECHNICAL — WHITEPAPER

Data analytics for rider and team profiles

Top contenders

Top teams

Using advanced data analytics we're able to give fans a data-driven view of all 186 riders in the peloton. We've created an athlete ranking system that focuses on results and form. This model takes into account the type of event as well as the other riders in the race and is run in Python modules in our data processing pipeline.



Athlete analytics to determine strengths, weaknesses, and the profiles of riders and teams

LEARN MORE IN OUR TOUR DE FRANCE EBOOK

Tour de France Femmes avec Zwift

World's greatest women cyclists and data analytics. iNTTerconnected.

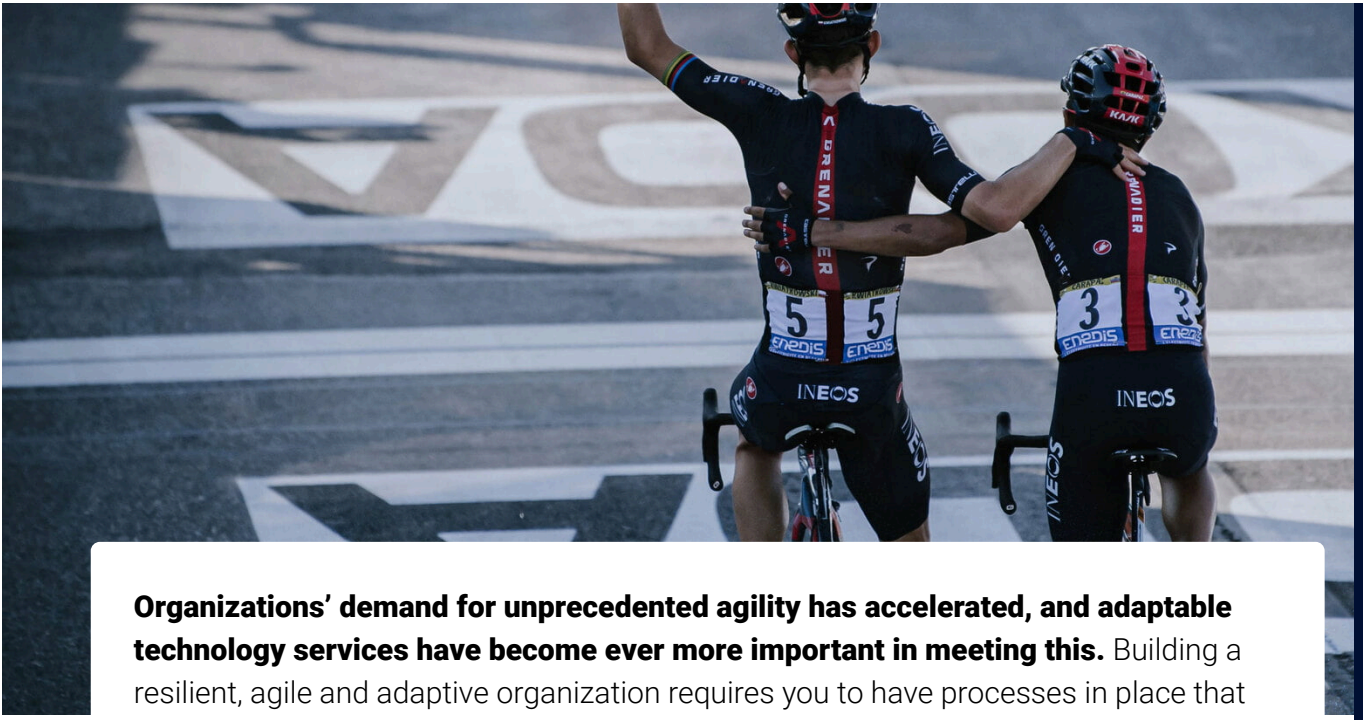
The inaugural Tour de France Femmes avec Zwift will start on the Champs-Élysées on 24th July, prior to the conclusion of the men's race. The race will feature 22 teams of six riders and will conclude on 31st July 2022. The event adopts the same codes, values, and symbols as the men's race; helping to encourage diversity and equality within the sport.

As the event's official technology partner, we will work with A.S.O. to implement a technology roadmap to provide a rich digital experience for fans. This will include Race Center, which brings together social media, and commentary and LeTourData, which will provide fans with data-driven insights and AI predictions across Twitter, Instagram, and TV broadcast to bring them closer to the action. And, together, we'll build a technology roadmap that'll bring never before seen innovation to the sport to truly uplift the profiles of the teams and athletes that make up the women's pro peloton.

"We're incredibly proud to be part of this historic event and to be supporting A.S.O in championing inclusivity and grassroots cycling. The launch of this race will have a significant impact on diversity in cycling and will go a long way in encouraging more women to get involved with the sport. Our technology will help to lift the profile of the women's race and bring its passionate fans closer to the action. We celebrate this step towards a more inclusive and diverse sport."

Marilyn Chaplin, Chief Human Resources and Sustainability Officer

Assessment tool



Organizations' demand for unprecedented agility has accelerated, and adaptable technology services have become ever more important in meeting this. Building a resilient, agile and adaptive organization requires you to have processes in place that enable your business to pivot and scale to take advantage of new opportunities. Does your service provider offer you the critical capabilities necessary to enable you to remain relevant and competitive?

Understand more about potential blockers

TAKE OUR SHORT ASSESSMENT NOW

SIGN UP TO OUR PARTNERSHIP NEWSLETTERS

to keep up to speed on all our sports and other partnerships. Together with our partners in sport, education, communities and the environment, we make great connections that change the world.

Partnering for Good

- Tour de France
- ZWIFT
- Qhubeka
- Major League Baseball
- Connected Conservation
- NTT INDYCAR SERIES
- The Open
- Global Goals
- Red Bull Basement
- A.S.O.

About NTT

NTT Ltd. is a leading, global technology services company. We're here to enable the connected future. Through the work we do with our clients and in our communities, we find ways that technology can make a positive impact.

We call it technology for good. To help our clients achieve their digital transformation goals, we use our global capabilities, expertise; and full-stack technology services delivered through our integrated services platform. As their long-term strategic partner, we help them enhance customer and employee experience, transform their cloud strategy, modernize their networks and strengthen their cybersecurity. And across their transformation priorities, we automate their business processes and IT, drawing insights and analytics from their core business data.

Together we do great things. We're proud to be part of the global holding company under NTT, called NTT Incorporated (Inc.) Jun Sawada, current President and Chief Executive Officer (CEO) for NTT, is also the CEO of NTT Inc.

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Thank you for reading

about our digital transformation of the Tour de France

Find out more at hello.global.ntt