alteryx

McLaren Racing fast-tracks data analytics in the race to accelerate

Making data-driven decisions at tremendous speed

Fifty years ago, Bruce McLaren hand-picked a small group of engineers to design and build racing cars. Today, McLaren Racing has achieved 20 Formula 1 World Championships, 182 Grand Prix victories, and now employs over 800 people. McLaren's successful racing heritage has been driven by a relentless desire to innovate, and they have consistently led the way in the development of groundbreaking technologies by engaging in strategic technology partnerships to improve performance.

With over 20 race weekends in the Formula 1 calendar, each generating **1.5 TB of data**, the ability to collect, process, and act on that data is crucial. The team at McLaren Racing uses the **Alteryx Analytics Automation Platform to accelerate strategic decision-making** both on and off the track.

"IT plays a huge role in how we operate as a standard commercial entity and how we compete," says Dan Keyworth, Director of Business Technology at McLaren Racing. "Everything we do across the three key verticals of design, build, and race is completely data-driven. Taking data parameters from something that is moving at high speed and figuring out how to engineer it to be better or go faster provides a competitive edge. Advanced analytics with Alteryx underpin this."

3 reasons McLaren Racing chose Alteryx:

1

Powerful insight across design, build, and race. The team can track performance at every stage and make fast data-led enhancements.

2

No prior coding knowledge required. Teams across the business can use data to make an impact regardless of coding background.

3

Maintaining a competitive edge under Formula 1 budgetary cost-cap. Advanced analytics enables performance and compliance in a new era of racing.

MCLAREN KEY STATS

Industry: Sports

Department: Cross-Departmental

Region: Global

30M
Trackside analytics support 30M race simulations

300
telemetry sensors on each race car generate 100K data parameters

11.8B
data points consolidated to optimize race performance

Insights that help design, build, and race the car

Design

With 80,000 components on a Formula 1 car and 90% of the car changing over the course of the race season, the ability to analyze effectively across the three verticals of design, build, and race is hugely important.

An average of 30 million race simulations are run to test every scenario of how each race will play out. The data to produce these simulations comes from multiple sources, including high-performance compute, the wind tunnel, computational fluid dynamics (CFD), and even data on the drivers themselves. As Edward Green, Head of Commercial Technology at McLaren Racing explains, "Alteryx allows the fast combination and correlation of those data sets so the teams can focus on what changes they can make that will improve performance iteratively across the course of the season."

Build

In the production phase, data on each car part is generated from the McLaren factory floor or from multiple external suppliers. The data will often be in differing formats, making it a challenge to understand and track costs. Alteryx automates the collection and processing of these varied data sets to accurately track production inventory and performance of parts.

Operating under a cost-cap does restrict the decision to move forward with the production of a part. To help inform build decisions, the McLaren team simulates the part virtually and uses computational fluid dynamics (CFD) to model the air flow through a virtual part on a car. The Formula 1 governing body regulates CFD run-times, so this process must be as efficient as possible. If a part passes through these testing processes, McLaren will produce the part and put that into the wind tunnel phase for more testing. Yet more data is generated, and if the part performs well in testing, the decision will be made to manufacture.

"On a race weekend, the data collected from that part will be combined with the other sensor parameters to test how it performed at scale," says Green. "With Alteryx, we can combine

the physical, virtual, and race world data to create optimal efficiency and build the most performant race-car possible."

Race

At the start of a race weekend, each race car has 300 telemetry sensors on board generating 100,000 parameters of information, including engine levels, fuel capacity, temperature, or even the amount of G-force the drivers will feel going into corners. This data is processed track-side using Alteryx and surfaced in real time to the driver engineers (speaking directly to the driver), and to the pit wall, where the leadership team and race strategy team sit. Allowing this data to flow seamlessly enables near real-time decision-making from a team that continues to challenge for podium positions, as demonstrated by their P1 and P2 finishes the Italian Grand Prix in September 2021.

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McLaren FORMULA 1 TEAM

Dan Keyworth, Director of Business Technology, McLaren Racing, McLaren

The data analysis does not stop at the track. There are 30 people based at the McLaren Racing HQ in Surrey, England, performing more analysis on parts tested in the practice races on the Friday before race day and correlating this with the data that was collected during digital testing of the car. The McLaren team uses aero model correlation with Alteryx to analyze the delta between how a part performed on the track versus how it was expected to perform. Decisions are then made on the level of trackside tuning to get the best performance from a part.

When operating under a stringent cost-cap, every opportunity to control operating costs and streamline efficiencies is crucial. Keyworth is particularly impressed with the predictive

analytics capabilities in Alteryx. "We can use the analytics tools to form a predictive picture on how much attrition we are likely to incur under certain conditions or on certain types of tracks. The insight is then used to decide how many spares to manufacture. Rather than go and manufacture ten, we can build what we are likely to use, which is also important from a sustainability perspective."

Advanced analytics driving a new era of racing

From 2021, all Formula 1 teams are operating under a strict budget cap of $145M enforced by the governing body for world motor sport, the FIA. Such changes tend to either challenge organizations or bring out a competitive edge. For McLaren, the budget cap was an opportunity to assess innovative technologies that would help them control operating costs while driving performance enhancements. Green saw the potential for the Alteryx Platform to consolidate data from multiple disparate sources and enable data-led decision making at scale."My job is to provide IT tools and platforms that make our business more efficient. By implementing a low-code analytics platform, we can free all our business users from the pain of data-wrangling and enable them to focus on outputs that drive our ultimate goal of winning races."

"**What impressed me with Alteryx was the speed of deployment** and the 'bring your own data' upskilling model," says Green. "Instead of sitting in hours of workshops working on dummy data, our teams were able to show up with live scenarios and test the capabilities of the Platform straight away."

The "co-piloting" method of upskilling puts the technology into the hands of users early on and, with the support of the Alteryx solutions engineers, it was easy to identify use cases across the McLaren Racing business functions. The code-friendly interface allowed deployment into the digital transformation team, along with marketing, software and IT, and aerodynamics.

"**Alteryx is changing mindsets around how our people use data to solve problems**. With the implications of the cost-cap, this change is super important," says Green.

Next Stop: Optimizing beyond the grid

The capabilities of Alteryx go beyond the sport of motor racing, and McLaren is also using the Alteryx Platform to enhance efficiencies and strengthen insights operationally in the finance and marketing departments.

Formula 1 fans are renowned for being the most loyal and passionate in the sports industry. The geospatial capabilities in Alteryx provide a deeper layer of understanding to fan data. By correlating fan and lifestyle partner location data, the marketing teams can create new engagement opportunities.

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> Edward Green, Head of Commercial Technology at McLaren Racing, McLaren

"If a lifestyle partner has a location in a city which happens to be near where many of our fans are based, we may decide to hold an event at that facility," explains Keyworth. "It is meaningful to be able to innovate and bring our fans closer to the sport, especially in the wake of a global pandemic."

For their finance teams, the Alteryx Platform is creating deeper alignments with the business from a regulatory and commercial point of view. "We are a standard commercial entity heavily driven by financial and legal processes, and there is a lot of data involved in all of those things," says Keyworth. "Alteryx not only has a large customer base in the financial industry, but a raft of strategic partners who can assist with very specific financial problems. We are excited to see the Alteryx capabilities continue to strengthen alignment and agility across the McLaren Racing organization."