Graeme Hackland

CIO, Williams Martini Racing

Having followed the Williams racing team for years as a Mansell fan, watching him race and winning world championships, this is Graeme Hackland's 21st season in Formula One motor racing, and his fourth as CIO of one of the UK's best known F1 teams.

These days whether you're an F1 spectator or team professional, it's highly likely you'll be using or benefiting from AV in one form or another.

Modular complexes used by F1 teams as their working spaces or for guest/client hospitality are constructed and transported to each of the Grand Prix venues by trailer. Once on site they're interconnected to create offices, meeting rooms, and open plan areas all with access to integrated AV systems.

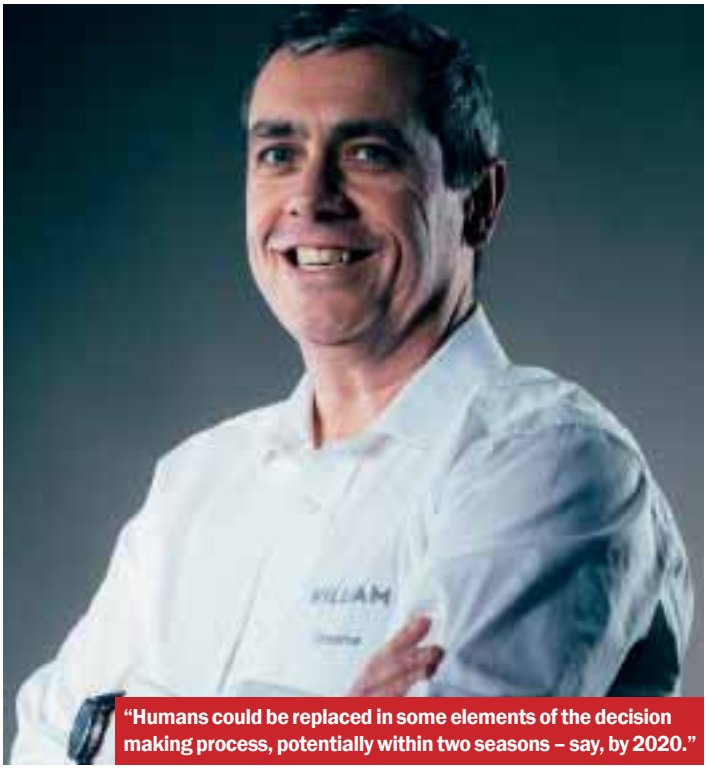
And this is just one part of a wider AV set-up which supports high level simulation, monitoring and distribution with all its assorted elements.

Brought in to drive a digital and information technology transformation programme, this aimiable super technician is looking to take all this to the next level by adopting artificial intelligence and mixed reality to help improve racing performance.

Understanding visual data

"In Sir Frank's (Williams, the team's co-founder's) 41st season I wanted to get him back to the front of the grid so we have been really aggressive in the last few years, focusing on what helps to make the car quicker. Top of the wish list has been making sense out of huge volumes of complex information. We live data, like all the teams, moving it from track to factory in near realtime so the engineers back at base can work on it. Everyone also has access to voice data but video is where we see the huge growth in data now which we use for competitor analysis and analysing our own car with other elements, such as weather and tyres and so on, which we've always been doing," says Hackland.

F1 teams want to import feeds to wherever they are as part of their videowall and control room systems. This is where AV and IT elements are really coming together to create tightly integrated environments. "We try to generate data on both sides so that we don't have to stream it. In the past we'd have taken a video clip and copied the file across a link, but you sometimes suffer long delays doing this. Now we're either streaming it or creating a video on both sides and just sending links to a time slice. So when the driver's in the garage and he's seeing a competitor do a lap, he's seeing that virtually in realtime and it's streaming back to him," says Hackland.



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Artificial Intelligence

In terms of F1's digital transformation process, some F1 teams are experimenting with visual analytics, AI machine learning, and simulation in the design, setup, operations, and strategic components they work on. Hackland also believes AI is going to make a huge impact on F1 operations.

"Although relatively limited in its use, it's an area we're all tracking. In fact you can see a time when the team manager sitting on the pit wall will be working with, or to some degree be replaced by an AI engine. 'Augmented' staff working with machine learning will be given data more quickly than is possible currently to help them make the right decisions. Take Mercedes' calling in of Lewis in Monaco a couple of years ago. The GPS data was six seconds awry, and he ended up third instead of first.

"Humans could be replaced in some elements of the decision making process, potentially within two seasons – say, by 2020," adds Hackland. "Initially we need to make sure we supply better data so we can make the right decision. You've got a maximum of 90 seconds to make a decision, but if you're at the second to last corner or the last corner, and they call the virtual safety car, what are you going to do? There often isn't enough time for a human to react. Much better to get AI into the equation responding much quicker with better, accurate information that's going to lead to much better decision making."

Will this impact AV simulation?

"The combination of AV and analytics turns data into a valuable asset rather than just sitting there as a cold archive. So, yes, I actually think it will because it's going to give you the speed that we don't have right now where we're taking many seconds to make decisions. An AI engine can help you make a decision that much quicker, in sub seconds which is a huge advantage if you can get there before the other team does."

Do you see yourselves using mixed reality?

"Perhaps. Clearly we're working with simulations, but driving simulators are a huge, huge expense, a dedicated facility that you have to build around a Formula 1-only car. We think that in the next few years we'll be using heads-up displays instead of having 10 projectors in a room. It's the next obvious step," says Hackland.

"Also, currently, mechanics at the track take pictures of the car – where it's been damaged, and upload it with other data to a folder which then gets pushed back to the factory which then examines that data, relaying it back and forth. If in realtime, they wore headsets communicating with the designer back at base and the mechanic looking at the car, the designer could see both their CAD drawing on the screen and what the mechanic is seeing.

"The drawing could then be altered straightaway so reduce the process from hours, sometimes days, down to minutes. Usually on a Friday, you see something wrong with the car, correct it, and the next weekend it's fixed. Sometimes we're making parts for the next weekend, so it's a triple header. If something gets damaged in that race, you're going to have to scrap and remake it. Using technology in this way would radically transform this process." ■

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