Business challenge

Racing hydroplanes and ocean boats at high speeds is dangerous and often difficult to adjudicate. How could SilverHook Powerboats improve racing safety and help officials make more accurate decisions?

Transformation

High-powered speedboats travel at over 150 mph, often through rough waters and strong currents. To keep drivers safe and help officials to judge races accurately, SilverHook built a smart telemetry solution using IBM technology, which equips drivers and officials with the information they need to make split-second decisions on the watercourse.

Nigel Hook
President
SilverHook Powerboats

Results

Boosts driver safety
while helping racers execute winning maneuvers

3x increase in engine longevity
reducing maintenance and operational costs

Provides tools
that can help race adjudicators make accurate, evidence-based judgements

SilverHook Powerboats

Steering speedboat racing into a data-driven future with Internet of Things innovation

Since Michael Silfverberg and Nigel Hook built the fastest, most efficient monohull of all time, SilverHook has become a global name in powerboat racing. As well as breaking world records, the company is exploring a new frontier of ocean speed and safety

"Because IBM Watson IoT can predict potential dangers, we can help boat racers make decisions on the watercourse that will keep them safe and guide them to a winning position."

—Nigel Hook, President, SilverHook Powerboats

Share this

Waves of change

Powerboats and hydroplanes are the fastest machines on water, reaching speeds over 150 mph. Racing these boats safely presents several technical and mechanical challenges, both for competitors and race officials.

Nigel Hook, President of SilverHook, powerboat racer and Guinness World Record holder, explains: "Racing speedboats and hydroplanes is both exhilarating and hazardous. At any moment, a strong wave, change in current or miscalculated maneuver could cause a boat to spin or crash—putting a driver's life in extreme danger. And because powerboats travel so fast, accurately judging races is incredibly difficult too."

Teams and drivers must comply with the strict rules of a race to be able to compete. For instance, in hydroplane tournaments, competitors must first qualify by completing an initial countdown start procedure around the watercourse at speeds no lower than 80 mph. Once qualified, drivers must then stay seven boat lengths apart from their rivals before they try and overtake. If they don't, their wake could cause the boat behind to flip.

Hook continues: "During and after a race, officials monitor overtaking distances with video footage, but this method can be imprecise. Gathering accurate, real-time updates on a boat's speed, revolutions per minute [rpm], position, and engine pressure is equally challenging. Yet this data is very valuable, as it could reveal winning tactics on the course and alert drivers to any potential dangers or mechanical failures."

Frustrated with the inefficiency of relaying information back and forth with his team members via radio, Hook worked with engineers at SilverHook to find a better way. The team recognized that recent developments in Internet of Things (IoT) and machine learning technologies presented an entire ocean of possibility.

Hook says: "We realized that if we could find a way to collect and analyze data in real time, using telematics, we could transform racing as we know it. With timely, reliable information on a boat's position, speed and engine performance, the possibilities would be almost limitless."

Turbocharged analytics

Sparking a sea change in boat racing, SilverHook built t3lemetry, a speedboat monitoring solution powered by IBM Watson IoT technology and hosted in the IBM Cloud. The t3 system relays data from sensors that track a boat's position, speed and engine performance via a mobile network to the Watson IoT platform for near real-time analysis.

Hook says: "We started using IBM Cloud technology when IBM first started developing the IoT solution. Their cloud gave us the flexibility, rich functionality and scalability that we required to develop, test and deploy our solution quickly. Without IBM Cloud technology, we probably wouldn't have been able to get to work on t3lemetry, as we simply didn't have the resources required to build and maintain our own data center."

SilverHook first tested the solution on its award-winning 77 Lucas Oil SilverHook race boat by collecting and analyzing information about the boat's speed, position, and engine rpm and pressure. The SilverHook team then trained their proprietary algorithm to identify patterns in the boat's performance. They then used the algorithm in combination with the Watson IoT platform to monitor the boat's sensors in real time and alert drivers to potential hazards and mechanical issues.

"IBM Watson IoT is such a versatile solution, providing us with rapid, powerful analytics capabilities as well as the ability to integrate with other technologies," says Hook. "For instance, when planning to break the world record for the fastest voyage between Key West and Havana, Cuba we wanted to find a way to translate the text from IBM Watson IoT into audio, as we would be out of range of radio signals from our onshore team during the attempt.

To do this, we connected the IBM Watson IoT solution with a small computer that could read out analytics insights directly to our headsets."

Next, SilverHook plans to test t3lemetry on a fleet of hydroplane boats at one of the biggest hydroplane racing tournaments in the world. In this trial, the company intends to demonstrate that IBM Cloud and Watson IoT solutions can provide insights that will help officials judge races with greater accuracy and fairness.

"At the moment, we only have historical datasets on the behavior of one boat—our 77 Lucas Oil SilverHook," says Hook. "We want to perfect the t3lemetry solution by training it on a much wider pool of data. With more information on the performance of high-powered boats in rough conditions, IBM Watson IoT will be able to predict hazards and likely engine behavior with even greater accuracy.

"We're really looking forward to the insights that IBM Watson IoT will deliver. With access to a range of solutions and excellent technical support from IBM, we believe that we will be able to apply t3lemetry to a wide variety of use cases in the marine tech arena."

"With IBM technology and expertise supporting us each step of the way, we can stay on the winning track and embrace new avenues for further growth and development."

—Nigel Hook, President, SilverHook Powerboats

Record-breaking results

With t3lemetry powered by Watson IoT and IBM Cloud solutions, SilverHook is making high speed boat racing safer and opening up new opportunities to set world records.

Hook explains: "Because IBM Watson IoT can predict potential dangers, we can help boat racers make decisions on the watercourse that will keep them safe and guide them to a winning position. Making speedboat racing safer and more precise will also help to encourage more people to engage with the sport."

Already, Watson IoT technology has helped the SilverHook racing team to make life-saving decisions when they established the Guinness World Record for the fastest journey between Key West Florida and Havana, Cuba.

Hook says: "During the trip, sensors in the IBM Watson IoT chain detected and issued an alert for a pending failure in our port propulsion system. With this insight, we adjusted the hydraulic controls to counter the forces from suddenly losing thrust on the port side, averted the loss of boat from tripping and stayed on course to break the world record."

The company has also been able to reduce maintenance costs dramatically by using insights from the solution to extend the life of the Mercury Racing engines powering the 77 Lucas Oil SilverHook—an improvement that the company plans to share with the hydroplane racing community.

"Because IBM Watson IoT alerts us when an issue is likely to occur, it is much easier for us to manage the stress we're putting on our engines," says Hook. "As a result, we've seen a threefold extension in engine life. With new engines costing approximately USD 155,000, boosting engine life yields a significant cost reduction—money which we can reinvest into developing t3lemetry even further.

"We're really excited to bring t3lemetry to hydroplane racing, based on the success we've had using IBM Watson IoT and IBM Cloud to monitor our own boat. We also feel very positive about the insight and guidance the solution will offer for race officials—helping them to safeguard the integrity of the sport. In the coming months, we are also considering using data from the t3lemetry solution to enhance our visualizations that will give spectators a real-time, detailed view of a race as it happens."

Hook concludes: "Looking ahead, we are also exploring the broader applications of t3lemetry in the marine industry. With IBM technology and expertise supporting us each step of the way, we can stay on the winning track and explore new avenues for further growth and development."

Solution components
- IBM® Cloud™
- IBM Watson IoT™

Take the next step
To learn more about the IBM solutions featured in this story, please contact your IBM representative or IBM Business Partner.

IBM is an established leader in the Internet of Things with more than 6,000 client engagements in 170 countries, a growing ecosystem of over 1,400 partners and more 750 IoT patents which together help to draw actionable insight from billions of connected devices, sensors and systems around the world. For more information on IBM Watson IoT, please visit ibm.com/iot.

IBM®