

LeeWay Marine & Mixed Reality

A Modern Approach to Marine Services

For centuries, the strong and courageous have taken to the sea in search of adventure. Today, the sea is no longer just a channel for hardy sailors seeking their fortune. For LeeWay Marine, it's the setting for innovation, for using inspired thinking and best-in-class technologies to solve modern problems. This marine services company has taken a new, more sustainable approach to providing technical expertise and support for crews on its vessels, both at sea and in port. LeeWay Marine worked with Kognitiv Spark to roll out a future-ready mixed reality solution on RemoteSpark devices, augmenting its in-person support model and reducing its risk, overhead, downtime, and overall carbon footprint.

Launched in 2016 and based in Dartmouth, Nova Scotia, Canada, LeeWay Marine owns and operates a fleet of four vessels: RV Novus, LeeWay Striker, LeeWay Odyssey, and LeeWay Venture. With crews and vessels to support a wide range of marine operations, it specializes in marine data acquisition services. The company serves ocean subsectors such as hydrographic and geophysical surveys, ocean technologies and research, naval defense, search and rescue, and environmental response.

A Rough Neighborhood in a City at Sea

LeeWay maintains a fleet of four ships in service of its customers. It uses advanced technologies to provide data acquisition solutions and support for complex, large-scale marine projects like mapping the ocean floor for nautical charts, conducting marine mammal surveys, partnering with military organizations for naval training exercises, and working with teams performing scientific research. The company's crews often work hundreds of miles out at sea in rough, unpredictable deep-water scenarios.

The ships' advanced technologies require hands-on support from highly specialized technical experts. Often at sea for months at a time, ships can't afford the downtime and significant cost of returning to port or flying in a technician every time a system needs repairs, troubleshooting, or maintenance. This created a huge

challenge for LeeWay, as the technologies its crews use aboard ship are mission critical for successfully completing the colossal projects customers entrust to them.

LeeWay's leaders liken each ship in the company's fleet to a floating city. If any element of one of these floating cities becomes inoperable, it jeopardizes the project. Explains Jamie Sangster, Chief Executive Officer at LeeWay Marine, "It's a big deal whenever we have to 'break the line,' that is, sail maybe 100 miles back to shore for a repair. We can save an average of \$25,000 a day in revenue by eliminating unplanned downtime for any of our vessels working at sea."

When the Ocean Becomes an Adversary

Technical issues jeopardize more than just time and costs. Running large-scale projects in the middle of the Atlantic Ocean can pose all sorts of risks, from extreme, dangerous weather conditions to health and safety issues for teams working with heavy equipment like cranes and winches. Says Sangster, "The ocean just wants to kill you—at all times. It doesn't matter if you're a mile off the coast or 500 miles out at sea. It just wants to kill you."

As LeeWay set out to explore viable ways to augment its technical consultation approach, COVID-19 hit. Aside from the obvious risks of in-person consultations at that point, the pandemic put even more barriers between the company's fleet and its need for specialized maintenance—including days of delays and a critical shortage of qualified marine technicians.

In the past, LeeWay crews often relied on email, text messaging, and video calls in lieu of in-person technical support when maintenance or repair issues arose. But the company wanted to provide ongoing, more cost-effective technical expertise, training, and support to staff working on vessels both at sea and in dry dock. To achieve this, LeeWay Marine decided to dip its toe into the waters of mixed reality.

Delivering (Extremely) Remote Hands-on Support

LeeWay Marine broke into the US offshore survey market around the same time that Sangster and Greg Veinott, Vice President of Business Operations and Programs at LeeWay Marine, got introduced to the idea of using a mixed reality solution. Recalls Veinott, “We went through a lot of struggles trying to manage the day-to-day vessel operations and defects as they occurred so far away, without the ability to physically be on the vessel or meet the vessel.” Then they learned about the Microsoft Azure-based RemoteSpark mixed reality platform from Kognitiv Spark, a member of the Microsoft Partner Network, and how they could run the software on Microsoft HoloLens 2 devices. He continues, “It was a turning point to say, ‘Aha! We can use this great combination of technology to provide the kind of oversight that we normally would if we were operating our vessels locally.’”

Kognitiv Spark helped implement the combined solution with three HoloLens devices so that LeeWay Marine’s expert consultants and technicians could see what its remote crews see. They can share 3D content, live audio and video, and holographic annotations in a highly secure way to resolve issues quickly and safely. According to Ryan Groom, Chief Technology Officer and Cofounder of Kognitiv Spark, delivering RemoteSpark technology on HoloLens 2 was the obvious choice. “HoloLens provided the only hands-free and tether-free device that offers true 3D mixed-reality capabilities,” he says. “The ability to have a video call with an expert and give the remote worker 2D content in a 3D space with step-by-step animated 3D content for complex tasks was the critical reason we selected HoloLens.”

The industrial-grade solution can operate in remote, low-bandwidth scenarios, making it ideal for use on LeeWay vessels hundreds of miles out at sea. Wearing a HoloLens device gives crew members a hands-free way to work in real time with a technical expert on

diagnostics, repairs, or training. “Having an expert technician immersed in our engine room, guiding us through a repair from 200 miles away, has been absolutely invaluable,” says Sangster. “We can circle something on the screen, and they can easily help us locate a specific technology or share a PDF resource we can use to fix the problem.” Adds Veinott, “In a situation filled with potential safety hazards, somebody headed out to sea with technology like this onboard can instantly unlock a lot of valuable information that could prevent catastrophe or allow them to respond faster.”

Lowering Business Risk, Cost, Downtime, and Environmental Impacts

By augmenting its technical support options with RemoteSpark and HoloLens 2, LeeWay Marine now has faster, easier access to the highly skilled engineers who help resolve issues—from small repairs to problems that can potentially grind operations to a halt. According to Veinott, “Gaining situational awareness quickly really matters, especially at sea. With HoloLens 2 and Kognitiv Spark, we have better insight into our systems and can correct technical issues before they become show-stoppers.” The company has significantly reduced its business risk and now regularly avoids the expense and downtime of breaking the line to return to shore for repairs or waiting for an in-person resource.

No longer flying technicians over from Norway to board its vessels has broader-reaching impacts as well. “We’ve improved our overall carbon footprint,” states Sangster. “When a vessel avoids transiting in to pick up somebody, that probably saves 10,000 to 15,000 liters of marine diesel and tons of carbon exhaust.”

According to Veinott, using the mixed reality solution will also help LeeWay Marine reduce the headcount required at sea. “Having fewer people onboard means our cities can shrink and we use less energy,” he says. “Adopting this technology helps us address a fundamental goal of our business—to determine how to use smaller vessels in a smart way to do the same work that a larger vessel would do but do it more efficiently.”

The Future of Mixed Reality

Sangster and Veinott hope to ride the wave of mixed reality to help their company—and their industry—rise to a new level. “When we look at the future of the marine industry, we see some really cool stuff on the horizon,” says Sangster. “Electrification and digitization of the vessels will play a big role as things evolve, and we’re currently working on some exciting mixed reality projects with the Royal Canadian Navy to take advantage of that. Having a more digital fleet will enable us to level-up the kind of data and analytics we can offer, and we’re really excited about that.”

