

Business Finland Healthy Travel Project

Appendix

Case study 1:

The Healthy Travel project solves urgent safety issues and charts the cruise industry's future beyond the pandemic

The [multidisciplinary Healthy Travel project](#), initiated by Business Finland in Autumn 2020, has brought together researchers with cruise companies, shipyards and subcontractors to improve health and safety on cruise ships and in terminal buildings.

“Our initial focus was on how to ensure a safe cruise experience in the middle of the pandemic. We then explored ways to attract more passengers to the ships,” says project manager **Jonas Spohr**, a lecturer from the Laboratory of Industrial Management, Åbo Akademi University.

During the project, researchers in Cell Biology and Industrial Management at Åbo Akademi created models to analyze passenger flows on vessels of different sizes and developed processes and procedures to minimize infection risks. Finnish diagnostics companies have developed different types of testing systems to cost-effectively prevent infected passengers from boarding the ships.

“We also produced a questionnaire to understand customers’ experiences and opinions regarding the safety measures implemented by the cruise lines in response to the pandemic, as well as their views on a range of other possible measures, including the use of technology to monitor passenger movements on a ship,” says Spohr.

The Healthy Travel project has also provided an opportunity to consider the long-term future of the whole cruise industry, including the diverse range of large and small businesses that serve the industry. In order to support the companies’ strategic decision-making processes, the project has collected data on cruise industry developments and shared its findings from the customer questionnaires.

“Most people involved in the project share that view that the sector is likely to change, even without the impact of the coronavirus. The pandemic will pass at some point, and the ships will be much safer than before, so we also need to understand the bigger trends shaping the future of the industry,” Spohr explains. Companies in the industry, especially sub-contractors, now have a window of opportunity to help the cruise liners to adapt to the future. Creating new technical, digital, and sustainable solutions or ideas to improve passengers’ cruise experience will likely generate more business.

“The big questions are concerned with: who are the customers of the future, and what will they value in the cruise experience? What is the impact of global trends like sustainability on the cruise industry, and how can all companies, including the subcontractors, be part of supporting these changes?”

Case study 2:

Coughing Finnish robot is ready to join the global battle against pandemics

Breathing, coughing and sneezing with scientific consistency and precision, a new robot head created in Finland produces small particles in the air, mimicking the aerosols and droplets that spread coronavirus when people interact. The robot prototype has been developed and preliminarily tested by researchers from [Tampere University](#), [VTT Technology Research Centre of Finland](#), and the [Finnish Institute for Health and Welfare](#) as part of the AIRCO research project funded by Business Finland.

“The droplets coughed by the robot can be supplemented with surrogate viruses to discover how the viruses travel in any given space,” explains **Topi Rönkkö**, Associate Professor of Aerosol Physics at Tampere University. “Used with the right measuring technology, the robot can be a useful tool in the design and planning of all kinds of indoor spaces, including ships and terminals.”

The robot can also measure how effectively masks, ventilation and air filtration and purification solutions prevent the spread of SARS-CoV-2 and other viruses, and verify the accuracy of computer simulations. Scientific measurements and reliable data are the keys to developing different methods to prevent the spread of COVID-19 and other diseases.

In the next stage of the research, the AIRCO project will combine its resources with two other projects funded by Business Finland involving about 50 Finnish companies and research institutions across a diverse range of industries and expertise.

“The robot will be used for further experimental research in the development and verification of the models that deepen our understanding of how aerosols spread in indoor environments,” says Rönkkö. “We will combine business-driven research with the best scientific information available to create solutions for the current challenges facing our societies and economies and to prepare for future pandemics.”

Business Finland sees excellent export potential for scientifically-proven Finnish solutions that can prevent the spread of epidemics and pandemics worldwide, including improved health and safety on all maritime vessels and in terminal buildings, dining areas and elevators.

Case study 3:

ALMACO partners with Genano to set new standards for indoor air quality on cruise ships

Scientific research showing that the COVID-19 virus spreads mainly through aerosols and particles has focused attention on indoor air quality as a crucial factor for minimizing infections among passengers and crew on cruise ships and other vessels. In response, Finnish companies [ALMACO](#) and [Genano](#) are partnering to provide the marine and offshore industry with advanced air decontamination technology that removes airborne impurities of all sizes, including microbes and the novel coronavirus.

Founded in 1998, ALMACO serves the marine and offshore industries with turnkey solutions for interior accommodation, catering, laundry, public and technical areas. The company has a long track record of newbuild and modernization projects for the world's leading shipyards and cruise lines.

"Finland is a forerunner in air purification and Genano is the most trusted actor in this field, with more than 20 years' experience in the most demanding settings, such as hospital operating theatres. ALMACO's extensive networks across the maritime industry enable Genano to bring its unique electric filtration technology to this market," says **Erik Schobesberger**, VP Modernization & Newbuilding Support, ALMACO.

Genano's patented electrical filtration technology removes even the smallest microbes. It effectively protects against the COVID-19 virus and also decontaminates indoor air from bacteria, mould spores, ozone, pollen, odours and harmful gases.

"We recommend Genano's proven technology to our customers because it is cost-effective, flexible and can be conveniently deployed on existing vessels. Compared to disposable HEPA filter systems, Genano's air purification devices do not clog up and are easier to maintain. With health precautions now at the core of the cruise experience, we are confident that Genano's solutions will set the standard for indoor air quality in the maritime industry of the future."

Case study 4:

KONE's data-driven research boosts safety and improves people and material flows on cruise ships

KONE, [a global leader for marine elevators and escalators](#), has conducted intensive research in partnership with several cruise line companies during the past three years. The aim has been to enhance the cruise experience by developing new solutions for the people and material flows on the ships while improving health and safety on board and in the terminals. The research has involved collecting data with sensors installed on the ships, timing activities, and interviews with passengers and crew members.

"We have collected a great deal of data that supports the companies' decision-making. Any changes on cruise ships must be fact-based and commercially viable solutions because the investments required are so large," says **Timo Pakarinen**, managing director for *KONE's marine business*.

KONE has used 3D simulation modelling of people's movements on a ship during embarkation/disembarkation and the sea day. This made it possible to run different test scenarios on how elevators and escalators work, depending on the number and types of passengers. Modelling includes different distributions of various walking speed groups, as well as restricted mobility users to match predicted passenger profiles. The end solution will help tackle challenges such as crowded elevator lobbies or other passenger flow bottlenecks.

The COVID pandemic has made KONE's research even more timely, as passengers have become very aware of the risks of infection in enclosed spaces.

"We have also carried out airflow research with VTT Technical Research Centre of Finland to make the elevator cars safer through cleaner air and better ventilation. The goal is peace of mind for the users by minimizing the health risks in our elevators," Pakarinen explains.

In addition to developing new solutions on existing cruise ships, KONE is also a supplier in several ongoing newbuild cruise liner projects. The full extent of KONE's research-based innovations will be revealed when these new ships are launched in the coming years.

"KONE's early involvement means that the shipowner gets the full value of our optimization service, because that's when the big decisions about the ship are made. This ensures that the ship will have exactly the right number of elevators in the right places to ensure optimal passenger flow experiences with investments in elevator equipment," says Pakarinen. "We see each strategic partnership as a means to facilitate innovation and identify efficiencies."

Case study 5:

Hypercell's tracking technology and IoT solution enhances people flows and safety

[Hypercell's IoT platform](#) uses Bluetooth signal sensors to collect data on people volumes, dwell times and flows in indoor and outdoor locations. The collected data is anonymous and GDPR compliant.

"Our platform combines the hardware and software needed for a complete IoT solution that has proved its value across a range of industries. We see great potential in the maritime industry in terms of enhancing people flows and safety onboard and in terminals as well as helping to make shipyards safer," says **Sami Vepsäläinen**, Chief Operations Officer at Hypercell.

Installed on a cruise ship, Hypercell's sensors can monitor passenger flows and trigger notifications to take action if areas become over-crowded, thereby increasing infection risks during a pandemic. Safety concerns can be further alleviated by the creation of named tags for all passengers or employees.

"On a cruise ship, the tagging feature can be added to each cabin card, enabling the faster evacuation of passengers in an emergency. At a shipyard, named tags could save workers' lives in the case of a fire. Our technology could quickly locate the tagged employees working on the different decks of a large vessel and guide their evacuation via the safest routes," Vepsäläinen explains.

Several cities are using Hypercell's IoT platform to optimize people and traffic flows as they move towards a digital and more environmentally friendly future. Shopping centres and other retail venues optimize their layouts and sales efforts based on the real-life data and movement patterns delivered by the platform. A live demonstration of Hypercell's solution, showing the volumes of people around Helsinki's city centre, can be viewed here:

<https://www.heatmap.fi/helsinki/>

"Big cruise companies and terminal operators could also utilize the data straight from our interface and bring it into their own systems. It is also possible to add a wide range of other sensors to the Hyperunit sensors to gather more information about the maritime environment under observation," says Vepsäläinen.