

# Whitepaper on servitization in the maritime industry



Industry insight





# The Servitization Revolution Comes to Shipping

There is a new concept that is rapidly gaining traction in the world of business. It is called “servitization.” It describes a transformative process in which manufacturing companies shift from a product-centric orientation to an integrated product-services focus. While many companies around the world are adopting servitization strategies, it has so far not been widely accepted in the international maritime industry. This is changing.

Danelec Marine, a Danish marine electronics manufacturer, is one of the first maritime suppliers to embrace servitization. The company is pioneering a comprehensive servitization strategy that permeates all aspects of its business, including product architecture, standardization of processes, quality control, worldwide distribution, after-sale service and repair, spare parts management and customer interface. This White Paper examines how Danelec Marine engineered this transformation and the implications for the maritime industry.

## What is servitization?

Business schools define servitization as “the innovation of a company’s capabilities and processes to better create mutual value through a shift from selling products to selling product-service systems.” This is not a completely new concept. In its most elementary form, it is what happens when your mobile network carrier sells you a phone or tablet bundled with a monthly service plan. That is servitization. When an HVAC contractor sells you a maintenance agreement or an alarm company installs a system in your home with a monitoring service, that is also servitization.



Companies today are broadening the concept in creative ways as a tool to strengthen customer relationships, add value and reduce cost of ownership across the full product lifespan, while gaining competitive edge and creating recurring streams of revenues and profits.

Rolls Royce, for example, is often cited as a servitization pioneer. Instead of selling aircraft jet engines, Rolls Royce now sells “power by the hour.” The customer buys power, not engines. Rolls Royce guarantees the engines will work and provides technical support and service as part of the transaction. Likewise, Alstom, a manufacturer of diesel engines for railroads, provides a guaranteed level of performance. If an Alstom-powered train is late due to an engine failure, Alstom incurs penalties of nearly a thousand dollars per minute for the delay.

Consider also the example of Microsoft. In the past the software giant sold its MS Office suite as a “product,” with a one-time purchase price for the license. The latest version, Office 365, is being marketed as a “collaborative cloud-based service” in which customers pay for access to the software on a monthly or yearly subscription basis. This makes it easier for Microsoft to introduce upgrades and new features and ensures that all users are standardized on the same version, simplifying service calls and troubleshooting problems. It also ensures a recurring revenue stream from the product.

From these definitions and examples, it is easy to see that servitization embraces a wide range of possibilities – from extended warranty programs to complete solutions like availability contracting, performance contracting and managed services.





## Maritime Manufacturers Slow to Adopt Servitization

While the servitization concept, often going hand in hand with cloud technology and the Internet of Things, is being implemented across many industry sectors, it has been slow to penetrate the international maritime industry for a variety of reasons. Most manufacturers of shipboard systems today still follow a traditional “silo” approach in which the product development, engineering, manufacturing, marketing and sales functions are separated from the service department.

Adopting a servitization strategy for products on commercial ships sailing global routes across 24 time zones presents unique challenges. Ships spend most of their time at sea, and commercial pressures mandate fast turnaround in port with a minimum of downtime. Thus, when an item of equipment needs to be repaired or upgraded, it is critically important to have the service team readily available at the port of call with technicians fully trained and equipped with the necessary parts to repair the equipment without holding up the ship’s sailing schedule. It would be prohibitively expensive for marine manufacturers to have their own factory technicians in hundreds of ports around the world, since the number of seagoing vessels is relatively small when compared with other industrial sectors, and there would not be a sufficient volume of business to keep them productively employed. So manufacturers normally contract with third-party service representatives who must be trained and certified on their products. They must also maintain depots of spare parts where they can rapidly be deployed as needed. In most cases, it is impractical to remove the system from the ship, so normally repairs have to be made while the ship is in port, or in some cases the service technicians may ride the ship to the next port and make repairs at sea.



*The innovation of a company’s capabilities and processes to better create mutual value through a shift from selling products to selling product-service systems.*



## Creating a Servitized Maritime Manufacturing Company

Danelec Marine is one of the first marine manufacturers to undertake a comprehensive servitization strategy. The company, based in Denmark, is a leading manufacturer of Voyage Data Recorders (VDRs). Similar to an aircraft's Flight Data Recorder (sometimes referred to as the "black box"), a ship's VDR records data from on-board systems and sensors as well as voice recordings from the bridge and radio communications for playback by accident investigators in the event of an incident.

VDRs are required by international convention on virtually all ocean-going cargo ships. Like many items of mandatory ship equipment, the VDR is often treated as a commodity. Shipowners tend to purchase the least expensive minimally compliant product. In operation, it is "out of sight, out of mind." It functions in the background, silently capturing and storing data and audio recordings for retrieval later. VDRs are required to be inspected and tested at least annually. Because the VDR is a critical safety system, if it is not functioning correctly, the ship may

be detained in port and not be allowed to sail until it is repaired and passes the Annual Performance Test.

Danelec Marine was one of the first companies to develop and bring to market ship VDRs in the 1990s, when the initial carriage requirement was adopted by the International Maritime Organization (IMO). Building on 20 years of experience with application specific product design for maritime use, Danelec Marine launched its Electronic Chart Display and Information System (ECDIS) product category in 2010, applying the same design principles known from the VDR platform. Today more than 6,000 ships are fitted with Danelec Marine equipment.

As an agile organization, Danelec Marine constantly strives to find new ways to provide the most efficient product and service solutions to the maritime industry in terms of safety, optimization and total cost of ownership.





Safety first



Optimization of operations



Total cost of ownership

# We provide the most efficient products and service solutions to the maritime industry

When the IMO implemented a new upgraded VDR standard, which came into effect in 2014, Danelec Marine's management team seized the opportunity to radically redesign their VDR product and more importantly to transform the company and its business through an integrated servitization strategy. This process took place on several different levels:

1. Designing serviceability into the product
2. Upgrading and establishing quality controls and standardized procedures across the service network
3. Using cloud technology to create a fully connected highly automated global service network
4. Redefining the role of VDR from a static product to an integrated product-service system



## **SOLID** Product design

### **Dependable operation**

*Equipment that is built to be at sea*

– Our products are based on an application-specific design to ensure extreme reliability. Fewer components mean fewer points of failure, resulting in the highest MTBF in the industry.

### **Future proof**

*Never obsolete, always supported*

– We guarantee serviceability of our products during their lifetime for a minimum of 10 years. Since our products are developed in-house, we have full control over all components.



## **SAFE** Service & support

### **Immediate support anywhere**

*There is always a service tech near your ship*

– Our extensive global network of service centers carry spare parts and provide service repairs 24/7 with 500+ factory-certified technicians in 50+ countries.

### **World class service**

*Consistent, efficient and transparent*

– Our eService platform™ automates and streamlines traditional manual processes, bringing unprecedented levels of consistency and efficiency to shipboard service.



## **SIMPLE** Operation & maintenance

### **Information at your fingertips**

*Capture shipboard data and put it to use*

– Our range of remote management solutions enable instant and cost-optimized management from shore to ship, so that you can harness the power of big data for informed decisions and more efficient asset management.

### **Maximize uptime**

*Rest assured your ship sails on schedule*

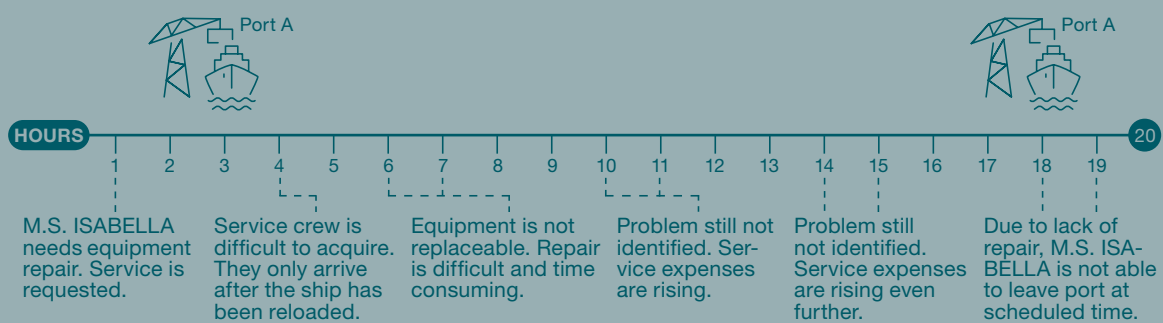
– Our exclusive SWAP technology™ enables fast and easy replacement of equipment in case of failure, without reinstalling software or reconfiguring the system.

# 1. Designing for Serviceability

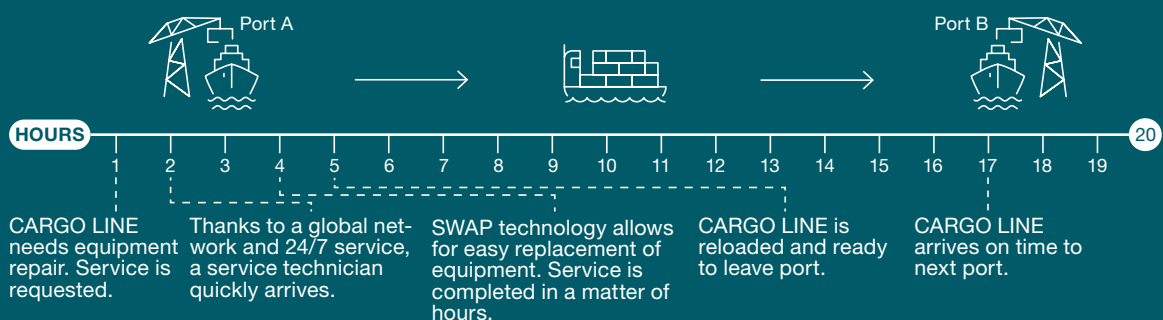
The first step in Danelec Marine's transformation was a total redesign of the VDR product with an eye toward greater reliability (fewer failures and less downtime) and easier serviceability. The company's new VDR has a purpose-built Linux-based computer rather than an off-the-shelf PC, with fewer parts and less electronics for better reliability. Since Danelec designs and manufactures its own products, the company guarantees that they can be serviced for a minimum of ten years after the end of life of the product line. In addition, with the next-generation VDR product Danelec pioneered a revolutionary new approach to shipboard service with its proprietary SWAP technology (Software Advanced Protection), in which all of the VDR's system programming and configurations are contained on a hot-swappable memory card that plugs into the front of the unit.

To fully understand the importance of the SWAP technology, consider a typical service scenario. A ship's VDR fails while at sea. The ship's master notifies the shipping agent at the next port that a service call is needed. Arrangements are made with the VDR manufacturer to have the local representative visit the ship as soon as it arrives. The technicians, armed with service manuals, go aboard the ship and begin troubleshooting the problem. They discover that a component has failed, and a new circuit board must be installed, but they do not have it in stock locally. They arrange to have it shipped by air express, and return to the ship a day or two later to install the new board, reinstall software programs and perform numerous tests to ensure it is performing to specifications. Meanwhile the ship is not allowed to leave port because the VDR is a critical safety system. The ship manager incurs tens of thousands of dollars in fees and losses from the in-port delay.

## REPAIR ON BOARD



## MOVE REPAIR TO SHORE



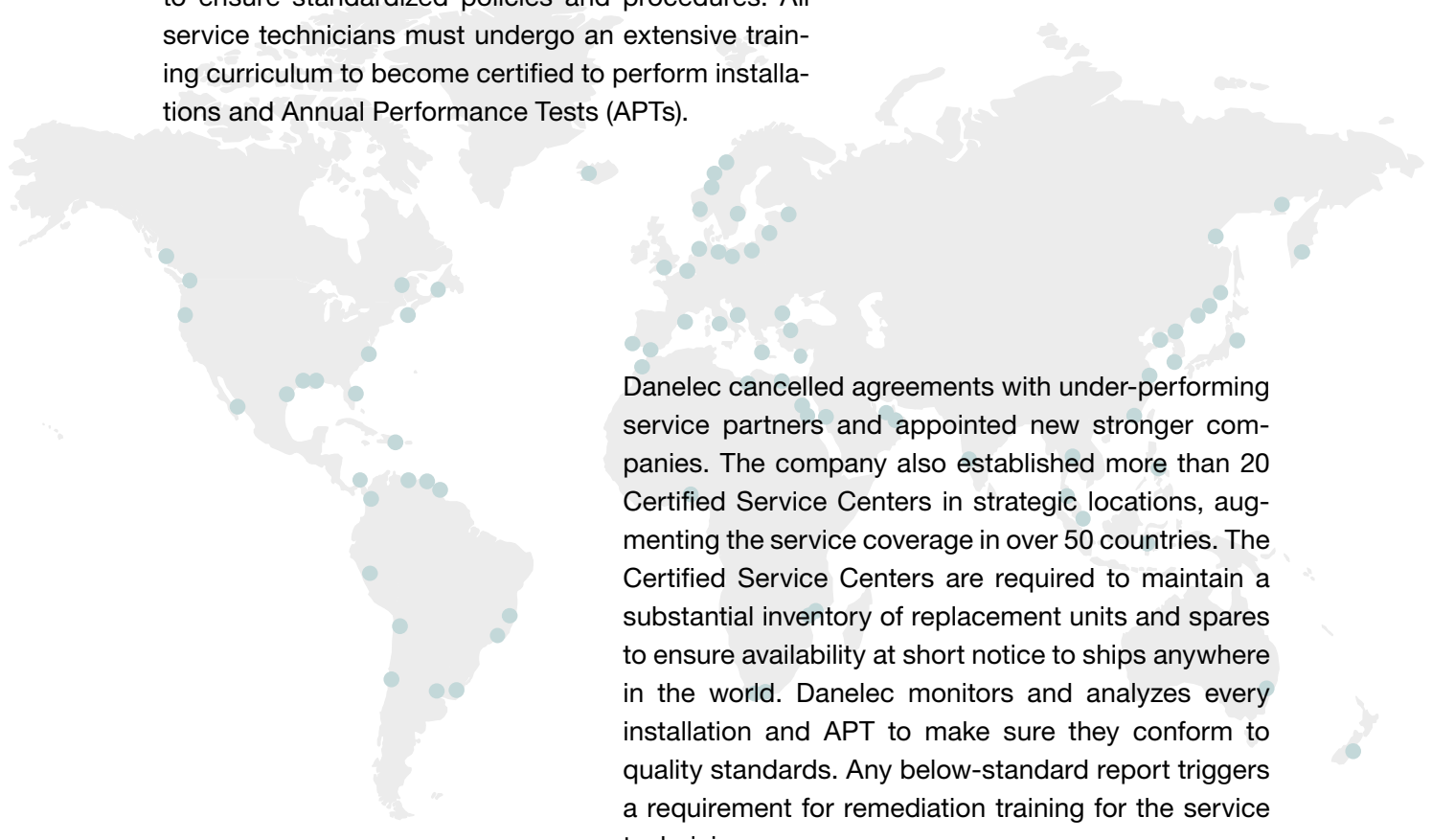


Now consider the servitized scenario with SWAP technology. The service technician arrives at the ship bringing with him a replacement VDR processing unit. He extracts the memory card from its front panel slot, disconnects and removes the old unit, slides the replacement unit into the rack and re-inserts the memory card from the old VDR into the slot on the front of the new one. There is no need for reprogramming or software uploads. The VDR is immediately fully functional as soon as it is switched on. The faulty unit can then be taken ashore for repair in a Danelec-certified repair facility and if possible put back into inventory. The service call is completed in a matter of hours instead of days. The ship sails on schedule.



## 2. Upgrading the Service Network

At the same time, Danelec took measures to strengthen its worldwide service network, establishing the industry's most rigorous standards for service partners to ensure standardized policies and procedures. All service technicians must undergo an extensive training curriculum to become certified to perform installations and Annual Performance Tests (APTs).



Danelec cancelled agreements with under-performing service partners and appointed new stronger companies. The company also established more than 20 Certified Service Centers in strategic locations, augmenting the service coverage in over 50 countries. The Certified Service Centers are required to maintain a substantial inventory of replacement units and spares to ensure availability at short notice to ships anywhere in the world. Danelec monitors and analyzes every installation and APT to make sure they conform to quality standards. Any below-standard report triggers a requirement for remediation training for the service technician.

### 3. Automating the Service Process

The third phase of Danelec's servitization transformation was the launch of the Danelec eService platform, an initiative aimed at automating and streamlining shipboard service for its products around the world.

Danelec eService is an internet cloud-based solution designed to provide seamless integration of the ship service process by connecting the equipment manufacturer, the local service company and the shipmanager to ensure fast, efficient and high-quality service for ships anywhere in the world.

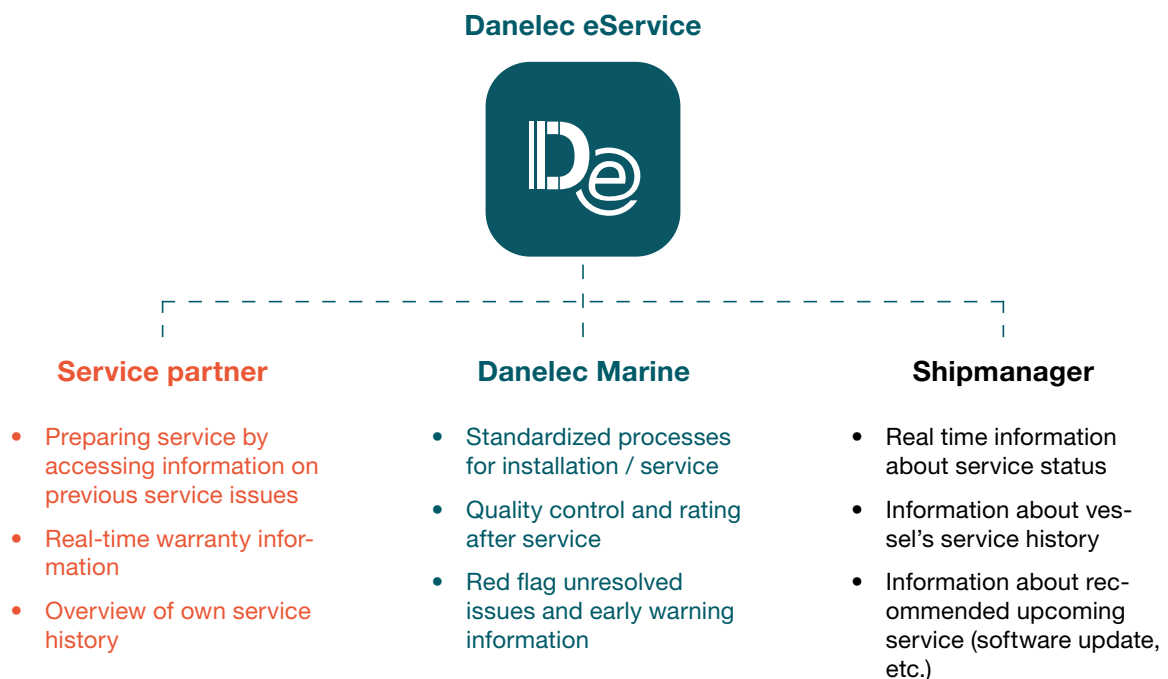
The eService platform uses a cloud-based portal to automate many of the traditional manual processes involved in planning and executing a service call. When a request for service is received from a shipmanager, the service company logs onto Danelec eService and retrieves information about previous service issues. The service company plans the service call and pre-alerts the shipmanager with potential issues to be addressed, assuring that service technicians are fully prepared with the proper tools and parts, minimizing their time aboard the ship. At the end of the service call, the technician uses the Danelec eService tool to perform an automated error check procedure, to verify product performance before leaving the ship. The tool also extracts a data sample from the VDR.

Once ashore, the service technician connects to the Internet and sends the data sample to Danelec. The Danelec technical team reviews the data as part of the quality control procedure and rates the quality of the service job. If the vessel has had more than one service call recently regarding the same issue, it initiates a "red flag" warning, and the Danelec team develops a plan for solving the issue and monitoring for repeat occurrences. Reports are automatically generated to the service company's and shipmanager's eService accounts.



The eService platform and Danelec’s rigorous in-house quality procedures bring unprecedented levels of consistency and efficiency to shipboard service. For the manufacturer, it ensures standardized procedures are followed in installing the system, performing Annual Performance Tests (APTs) and servicing. It also provides consistent quality control, rates the work performed by the service technicians and “red

flags” any unresolved issues or early warning signs of potential points of failure. For the service company, it helps prepare for the service call by accessing information on previous service issues, real-time warranty information and an overview of the service history. For the shipmanager, Danelec eService yields information about the service status of the equipment, the ship’s service history and recommendations for upcoming service.

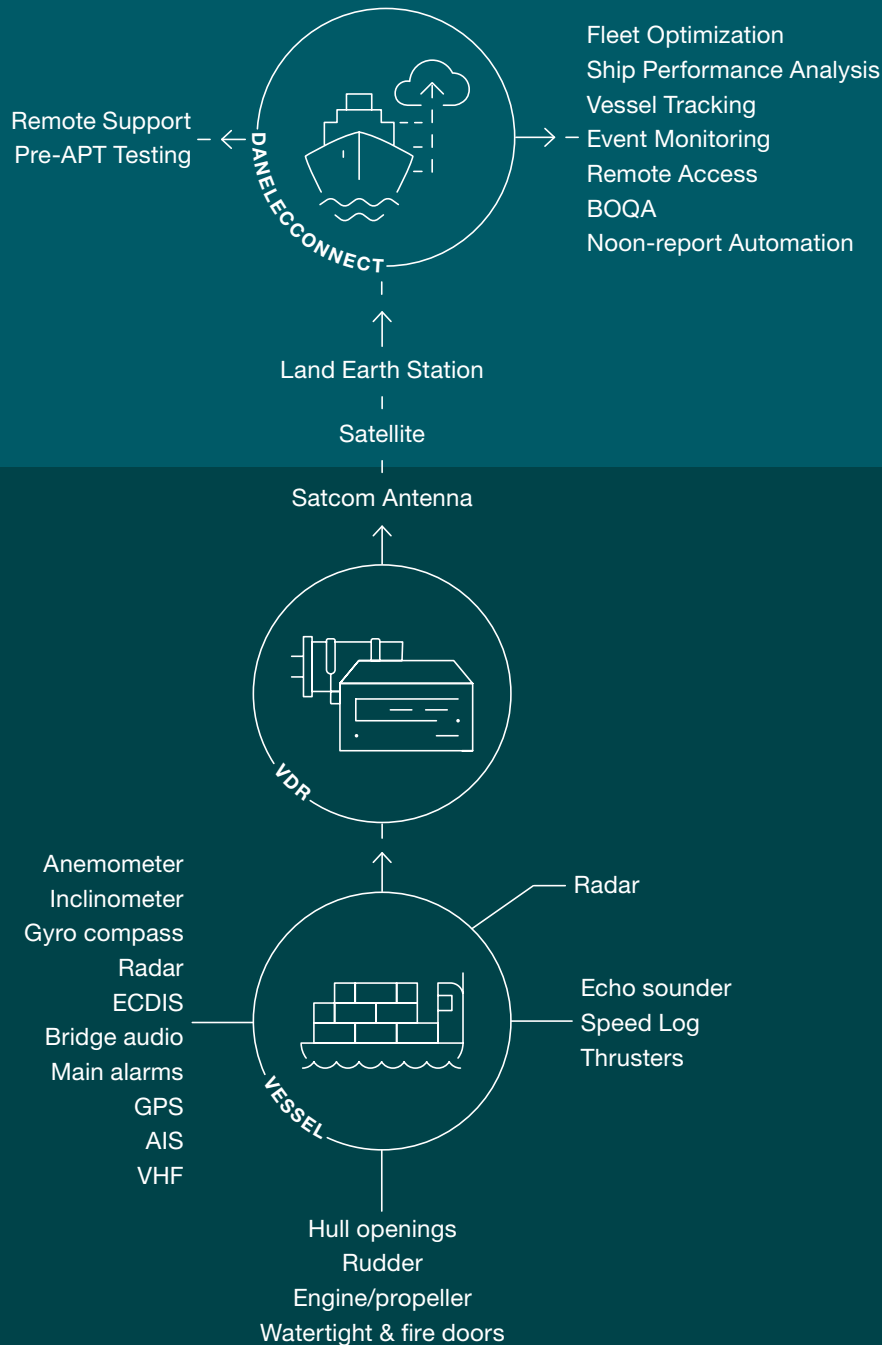




# 4. Remote Access Solutions

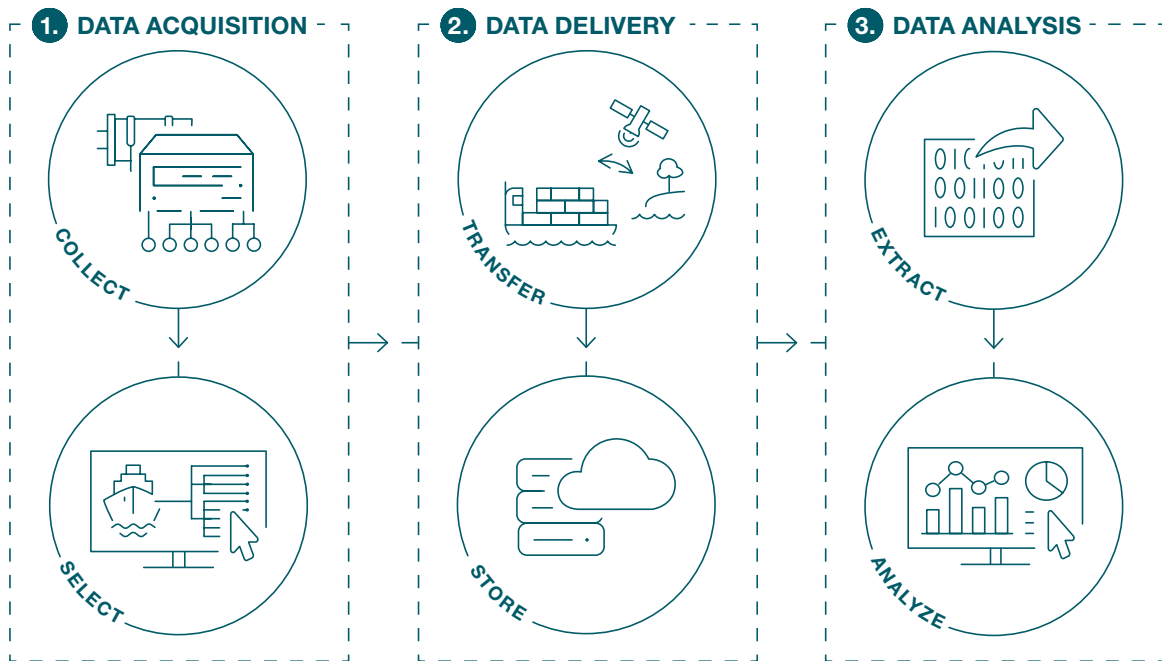
The final phase in Danelec’s transformation into a fully servitized company was the launch of DanelecConnect, a remote management service that provides selective transmission of data from the VDR via satellite to the home office. The ship manager ashore can log into a portal using a convenient dashboard on a computer to request specific data files to be downloaded from the VDR and select intervals for automatic transmission.

Danelec’s remote management capability allows “push-through” and “pull-through” of data sets from the VDR. The ship operations team can query the VDR at any time requesting data from specific sensors or set up a schedule of downloads from each sensor, under dynamic control from the computer. The DanelecConnect service is optimized for narrowband satellite channels for ship- shore transmission for additional cost savings.



There are a number of potential uses for the remote access solution. It can provide a useful tool for detecting unsafe practices, analyzing incidents and correcting navigational mistakes. Using data from the VDR, the ship manager can set up remedial crew training, correct poor practices and create event-driven roles for parameters for automatic reporting from ship to shore. It also provides a portal for remote configuration of the VDR, reviewing mandatory data for the APT or trouble-shooting a problem with the VDR prior to a service call. It can provide an immediate warning to the ship manager ashore if any devices sending data to the VDR should malfunction.

Thus, the VDR continues to fulfil its primary role of recording data for accident investigation, while also assuming a secondary role as the data hub for a ship telematics system. Using the VDR as a central data collection point and clearing house greatly reduces the cost of installing and maintaining a dedicated data network aboard ship, with serial and analog cables and/or wi-fi connections with numerous items of equipment throughout the ship.



# Summary

Servitization as a business strategy is sweeping through most industrial sectors. It has benefits for all parties on the sell side and buy side. For the manufacturer it provides competitive differentiation, deeper relationships with customers, enhanced customer satisfaction and loyalty, and a source of recurring revenues. For the customer it provides more value for the money and lower cost of ownership, as well as faster and better after-sale service and support. It is clearly the wave of the future in business relationships, and the time is right for the maritime industry to climb aboard.

For more information, visit [danelec-marine.com](http://danelec-marine.com).



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