



# BIG DATA

## IN THE MARITIME INDUSTRY

Richard Hepworth, President, Trelleborg Marine Systems, Dubai, UAE

Big data has the potential to transform our industry. Through application and insights, big data is creating new opportunities to drive innovation and deliver tangible operational efficiencies across the shipping world. But information alone is not enough. It is the analysis of this data and the actionable insights it provides that will move our industry forward and determine our future. This is a time of huge change for our industry. The advancement of automation, and the exponential rise in data it brings, mean disruption on a scale that 'shipping' has never seen before.

Trelleborg's marine systems operation recently commissioned an independent study bringing together the latest news and thinking to provide a comprehensive overview of big data in the maritime sector. It includes a look at how and where these technologies are being implemented and the key application areas that will deliver future operational efficiencies for ports and terminals.

Herein, Richard Hepworth, President of Trelleborg's marine systems operation discusses the findings of the research to

explore how the maritime industry can better understand the opportunities that big data offers, both now and in the longer term.

### BIG DATA AND AUTOMATION ADOPTION

Despite 94% of maritime leaders believing that it is time for the industry to move towards smart shipping, uptake of automation has been slow, according to a survey conducted by Sea Asia. Additionally, according to a report by Ericsson, the maritime industry lags behind other transport industries in terms of its use of information and communications technology. Only a handful of marine companies currently leverage big data.

There are several benefits that the industry can derive through the use of big data. The industry generates roughly 100-120 million data points every day, from different sources such as ports and vessel movements. Companies can analyse these data points to identify efficiencies such as quicker routes or preferred ports resulting in an extra 5-10% increase in performance. For example, the implementation of Eniram's big data analytics systems in 12

Royal Caribbean Cruise ships resulted in 4% estimated annual savings (US\$12 million annually).

### OPTIMIZING OPERATIONS

Smart technologies and robust data sets will empower increased efficiency through greater visibility into operations. Current overreliance on paper-based systems, in the absence of reliable real-time data may mean port and terminal owners and operators are failing to understand the root cause of delays, unable to clearly define problems and therefore find solutions to reduce operational costs and increase berthing capacity and throughput.

It also means ports and terminals run the risk of unnecessary human error issues and lack of transparency if there is an incident. With a lack of coordination amongst an ever expanding number of stakeholders, each of which has their own agenda, communication can be ineffective, costly and take far longer than necessary.

For ship owners and operators, many operations at the port-vessel interface remain largely manual, posing hazards both on deck and ashore that can potentially lead

to damage and loss to cargo, ships, cranes and port infrastructure not to mention, an unsafe environment for personnel. Currently, shipbuilders, ship owners and ports are focused on running reasonably efficient operations and not on running a highly flexible, responsive trading business of 'container-as-a-community'. This means that there is a lack of cross-enterprise processes. Companies are concentrating on automating processes within functional silos instead of taking a holistic view of the enterprise. This prevents the true potential of big data from being realised.

The lack of a common platform for communication has long resulted in insufficient coordination between parties. For ship owners and operators, to speed up and increase the reliability of their operations, a standard interface and a standardized method of collecting and storing data is vital.

Port approach is also a key concern for ship owners and operators given the unnecessary fuel consumption, emissions and costs caused by port congestion. The lack of data capture, and failure to standardise and utilise available data, is taking its toll on port efficiency with many vessels missing their berthing slots. What's more, the rapid growth in vessel size and cargo exchanges have created new technical and operational challenges when it comes to terminal and berth allocation. It's astounding, then, that considering the industry is facing pressure to become more competitive, facilities are not doing more to slash vessel idling times and reduce their overall carbon footprints. Automated technologies are well placed to facilitate superior planning and scheduling to ensure visiting vessels are turned around as quickly as possible, thereby reducing fuel consumption and emissions.

### THE OPPORTUNITY

While it is great to see that vessel stakeholders are increasingly waking up to the value of automation, particularly when it comes to landside operations, the importance of the interface between ship and port, on land and at sea, is widely undervalued. There is a huge opportunity for port entry, departure, and jetty side operations to become significantly more efficient, productive and sustainable. Seamless arrival means optimised unloading and departure. The data being captured currently is really only the bare minimum.

The interface between vessel and port represents the most risky and unpredictable situation that occurs within the port environment. For instance, the mooring procedure alone was responsible for 227 reported incidents between

2010 and 2014. While the number of stakeholders involved increases risk, with more parties comes more data points, and significantly more asset and performance data that will allow us to implement vast efficiencies.

At Trelleborg, we have what we consider a unique overview of the 'vessel turnaround' process, and data extraction points throughout it – both on board the vessel and in the port, and in the interface between the two.

### CASE IN POINT

In order to optimise efficiency and reduce downtime at a port in Oman, it required a complete, real-time overview of port approach, vessel berthing and departure. Trelleborg had previously supplied the port with Quick Release Hooks (QRHs), Docking Aid Systems, fenders and SafePilot Portable Pilot Units (PPUs). However, while each solution provided a touchpoint for data collection, they were supplied across disparate projects, so were not integrated and were manually managed. However, integrating each of the port's previously disparate port operations and with information presented in real-time Trelleborg was able to provide the holistic oversight it requires to analyse the performance of assets and identify areas for optimization to enable efficiency gains.

### THE OUTLOOK

As our industry faces a globalization of operators, an increasing scale and utilization of vessels, and an expectation of ever-improving efficiencies, ship/port owners and operators must work smarter

together to address and deliver against these expectations.

According to the Global Marine Technology Trends 2030 report published in November 2015, big data analytics will be one of the top 18 transformational technologies being used by the sub-sectors (commercial shipping, naval and ocean) in the marine industry.

The collection, analysis and actioning of big data will undoubtedly transform and increase the efficiency of day-to-day operations across the shipping industry in years to come, particularly at the interface between ship and port, on land and at sea. Therefore, those that invest now in the architecture that empowers collaboration between smart assets, will be best equipped to face the future.

### REFERENCES

- (1) <https://www.prnewswire.com/news-releases/maritime-leaders-call-for-adoption-of-technology-sea-asia-2017-survey-300246908.html>
- (2) <http://www.arrelic.com/industries/insights-details?id=1008>
- (3) <https://shipandbunker.com/news/world/418930-large-shipping-companies-cant-afford-not-to-use-big-data-for-operational-efficiency-says-bahri-advisor>
- (4) <https://www.linkedin.com/pulse/big-data-savings-maritime-ops-henrik-segercrantz-antonio-j-moyano/>
- (5) <http://www.lr.org/en/news-and-insight/news/global-marine-technology-trends-2030.aspx>

### ABOUT THE AUTHOR

Richard Hepworth is a Chartered Mechanical Engineer, having studied for his degree at the University of Manchester Institute of Science and Technology and now holds the position of Business Unit President for Trelleborg's marine systems operation, based in Dubai. Richard has over 20 years' experience working in the offshore and marine construction industry and has held a number of roles both within Trelleborg and other large engineering companies in this sector, covering engineering, project management, sales, business development and general management.

### ABOUT THE ORGANIZATION

Trelleborg's marine systems operation designs, manufactures and installs bespoke fender systems, docking and mooring

equipment, oil and gas transfer technology and vessel efficiency technology for marine environments all over the world. Trelleborg works with specifiers on a project by project basis to determine best fit solutions and supply fully integrated systems to fulfil even the most demanding specifications. Whether the project calls for equipment for a single berth, or an entire port, in-house design coupled with manufacturing and installation expertise ensures operational performance is maximised and long term maintenance is minimised – keeping whole life costs low.

### ENQUIRIES

Trelleborg Marine Systems  
PO Box. 261758  
Jafza Showroom S3A2SR09  
Jebel Ali South Zone  
Dubai, UAE  
Email: richard.hepworth@trelleborg.com