MEET THE SMART PORT

KATIE EADES AND **JOHN PEPPER** EXPLAIN HOW DIGITALISATION OF PORTS USING GIS, IOT, AI AND OTHER TECHNOLOGIES COULD NOT ONLY OPTIMISE RESOURCES BUT ALSO IMPROVE EFFICIENCY AND TRANSPARENCY

Global trade is very much in the limelight and with an estimated 85% of all globally traded goods being transported by ship, ports have a major role to play in the worldwide supply chain. The World Economic Forum stated in 2016 that "the world was standing on the brink of a technological revolution that will fundamentally alter the way we live, work, and relate to one another". So how are ports responding to the digital transformation and in their quest to operate in a 'smarter' manner?

Ports are multi-faceted businesses and operate in a very challenging and dynamic environment, with constant movement of people, cargo, vessels and equipment, as well as forever changing environmental conditions that can critically affect these operations. Ports also have a responsibility to the people, environment and businesses that live and operate around them, onshore and offshore.

Maintaining efficiency, safety, port integrity and compliance is of utmost important and many ports are seeking progressive changes that can support economic growth, as well as safe and efficient operations. Ports are not only now investing in automated machinery and advanced technology such as facial recognition and CCTV systems, they are waking up to the pressing requirement for better data governance and the implementation of a data management infrastructure.

OceanWise has been pioneering the idea of a maritime information infrastructure for the past seven years and firmly believes that ports need to increasingly challenge the way data is collected, stored, shared and exchanged in the innovative applications being developed. Treating data as 'infrastructure' is vitally important and in doing so, harbour masters, port managers and hydrographers can then appreciate data as a valuable asset that underpins almost all a port's operation.

Is this the era of the 'smart port'?

A smart port can be described as one that uses automation, technology, AI, the Internet of Things (IoT) and Big Data to drive improvements in efficiency, performance and cost effectiveness. Moreover, ports that are 'data centric' and using innovative technologies to drive progression and efficiencies certainly seem to be adopting a 'smart port' mentality. We are proud to work with ports from all around the world and have seen a significant increase in the requirement for data management training, as well as implementing applications or systems that have data sharing and interoperability at their heart.

The port of Rotterdam in the Netherlands, which wishes to be the "smartest port in the world", cites digitalisation transformation as a major part of its smart port journey. As ports like Rotterdam embark on progressive change, so the United Nations Committee of Experts on Global Geospatial Information Management is actively working on creating policy based on raising awareness and highlighting the

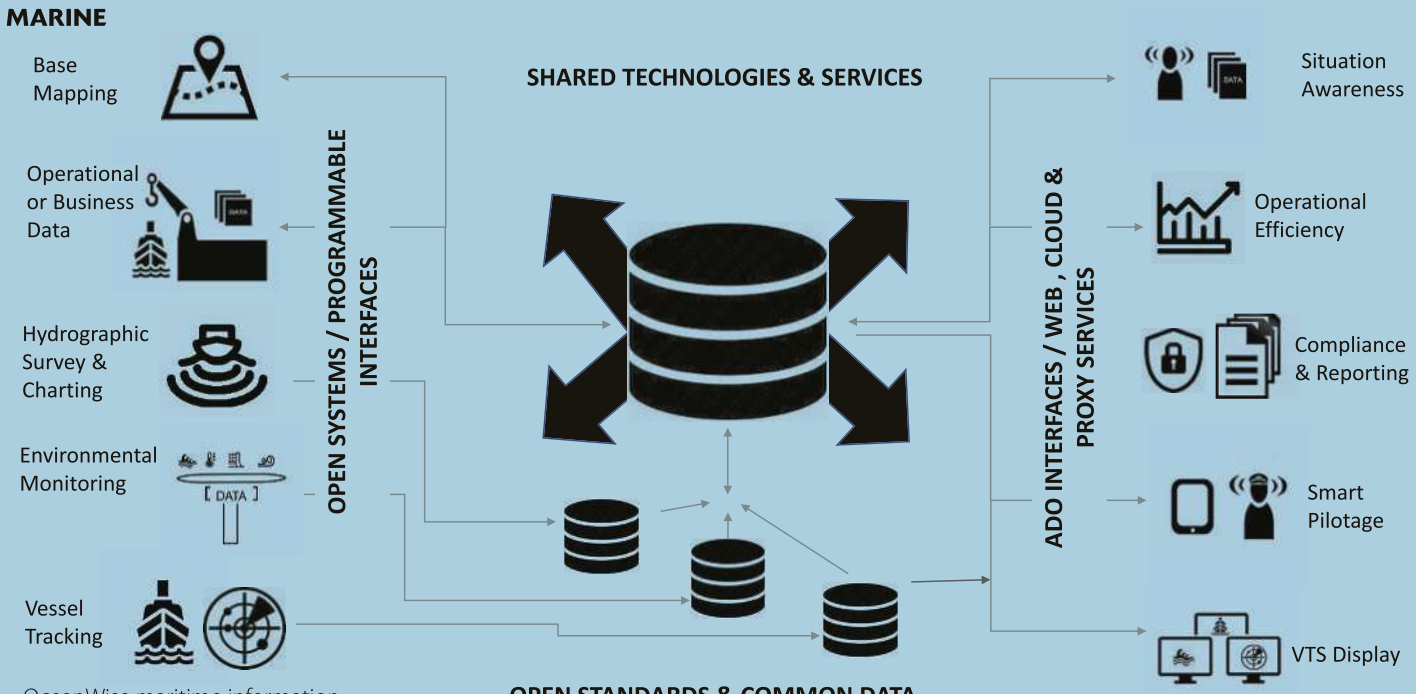
A Trelleborg PPU (Safe Pilot) combines a range of data including real-time tide and wind

importance of reliable, timely and fit-for-purpose marine geospatial information to support the administration, management and governance in the marine environment.

'Smart port' thinking could not only optimise resources but also improve efficiency and transparency in operations. In doing so, it could enable data sharing, improved safety and importantly, lower costs. It can also be used to monitor environmental impacts both on and offshore, such as air and water quality.

How can GIS assist 'smart' operations?

Ports need to make better use of the opportunities that digital platforms can bring by investing in GIS, to gather, manage and use geospatial information throughout their businesses. For example, incorporating both marine and land assets could represent a 'quick win'. All data with a spatial element



OceanWise maritime information infrastructure © 2012

can be incorporated and integrated into operational systems and viewed on digital maps simply because 'everything happens somewhere'. For example, vessel locations, navigational buoys, cargo consignments, security data, people/asset/vehicle movement and environmental data can be easily uploaded, viewed and analysed in a GIS.

The installation of a GIS alone is not enough, however. Data management and data governance must be applied in a way that ensures the data is accessible and reliable and can be consumed by all those people who can benefit from it. We believe that if it is implemented with care over time, digitalisation can assist ports develop in a 'smarter' manner across most if not all their business and operational activities.

What are the challenges?

Often, the biggest barrier is 'change' itself. The maritime sector remains rather uninformed and sceptical of developments such as the IoT and AI, and there remains a fear of the unknown. Whilst we are firmly engaged in the digital age, we are still challenged in the way we mitigate and respond to the risk of and outcome from cyber-crime, as well as data protection and security. Any changes, no matter how progressive, must come with assurances about the safety and security of data.

Ports can and should learn from each other to implement best practice. There are very active maritime membership bodies that provide support in these areas of concern through open forums and workshops, stimulating members to learn from each other's experiences, whether positive or negative. It's clear that education, communication and training will be extremely important considerations for any port embarking on a programme of 'change'.

Cost is also a limiting factor as innovation, adoption of new technology, equipment and even training can be expensive. Ports historically have evolved with small incremental changes so fundamental change in the way things are done is providing a real challenge. Change is necessary for ports to remain viable, so the case still needs to be made to ensure that the return on investment when weighed against the commercial risk of 'doing nothing', makes commercial sense.

One of the biggest challenges in bringing about 'change' does not rest with the data, the technology or the standards we use to share and exchange data – it lies with the governance of data vested in the organisation and its people. We need to embrace a comprehensive and globally shared view of how technology can affect and reshape ports rather than operating with an isolated or 'silo' mentality.

The digital transformation of ports has started and will make a difference around the world to positively support the world-wide supply of goods. Transformation is set to continue, and ports are adapting and starting to accept change. If port data and information is given the attention and governance that it deserves, then the progression of digital transformation in ports should run smoother and ultimately maximise the benefits derived from that transformation.

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