

Why ports should transform themselves into digital data platforms

Photo: NASA/Rawpixel

The new fuel

by **Bartosz Dąbrowski**

It appears that digitalisation has penetrated every nook and cranny of our everyday lives. Thanks to going digital, many businesses have reached new heights. No wonder then that the maritime industry, though conservative by nature, wants to make sense of this all-embracing change and jump on the e-bandwagon. Yet, going down the digital lane isn't as easy as ordering the IT guys to buy and install new software. Even the most well-established parties, like seaports, have to re-invent themselves. Easier said than done, but there're ways of, e.g., transforming ports into real digital platforms, argue the authors of the Port of Rotterdam's *Move Forward. Data as Fuel for the Digital Port* white paper.

future ports will have to invest in both hard- and digital infrastructures to maintain and develop sound relationships with their clients. They will have to approach the issue carefully and consequently, in order to avoid the fate of such businesses as the hotel industry, where properties no longer retain a direct relationship with customers due to the emergence of online booking agencies. As such, ports should transform into digital platforms on their own, without the need for intermediaries. That does not mean ports will need to become software houses but rather open, transparent platforms interconnected with other parties along the supply chain to add value (e.g., eco-benchmarking by gathering data on CO₂ emissions or optimising berth and yard usage by collecting data on vessels' waiting times and the containers' location).

"It's the data, stupid!"

The availability of data and its proper use are pivotal in simplifying port operations as well as making them more efficient

and safer. So far, data have been either under- or unused in the maritime industry. However, ports, just like other platforms and industries, could welcome numerous innovative products and services with the proper management of data. For instance, similarly to the software industry, port platforms could become open to third parties and their developments with the use of such methods as Application Programming Interface stores. One such example is Port Insight, a joint venture between the Port of Rotterdam and the Dutch company TWTG. Their project aims to develop Internet of Things-enabled solutions. Since its launch in November last year, its first achievement was a service through which barges can be tracked across a large part of Europe. Effectively, this solution spares the barge operators a lot of mundane, manual tasks, including paperwork such as invoicing.

Next, in its move towards becoming a smart port, Rotterdam introduced this year a hydro-meteo monitoring system, which uses a network of sensors to provide accurate

and up-to-date water and weather data, used particularly for the planning and management of shipping. In total, 44 sensors installed across the port feed data on the height of tides, tidal streams, salinity, wind speed and direction, and overall visibility.

Making use of digital twin technology is another promising avenue worth exploring. Building a quay wall, for instance, can be very costly and even the best blueprint is as good as its designers and the historical data they have at their disposal. On the other hand, testing the structure's functionality before it is constructed offers a much clearer insight into what impact a major investment like this could have. In addition to technical benefits, money saved through digitisation can be used elsewhere to fund other projects.

In control

Customers, including terminals, shipping lines, and forwarders also take part in the digitisation process. They can optimise their own processes should ports provide them with quicker handling of cargo, smarter applications, and better access to data. Customer satisfaction brings increased sales opportunities, especially when we think about new players on the market, like the growing e-commerce business.

Ports must be aware of the impact the so-called platform economy has made globally.

Platform giants like Amazon plan to expand their shipping arm by entering the maritime business, and it's only a matter of time before they disrupt the status quo in port logistics. Third parties collect vast amounts of data for the platform economy, but if ports want to become powerful digital platforms themselves, they need to remain in control. They should be creators and moderators of such platforms and help third parties optimise their processes by proper data sharing.

Apart from current opportunities, ports need to anticipate future developments. Transport is undergoing radical changes, with new fuel types making their way onto the bunkering market and autonomous vehicles being slowly but steadily introduced. Concerning the latter, successful operation of self-sailing ships depends on the proper handling of infrastructure and event data. The vessels need to 'know' what's happening in and around them to decide whether it's safe for them to berth as well as what's the most optimal time to call a port. A central platform managed by port authorities would be an ideal response to the need for such data.

Safe and sound

It isn't enough to come up with new ideas to transform a port into a real digital platform. Close cooperation with the port community is key as well. Only then is it

possible to support the analysis of shared data collectively, and it is easier to face any serious economic, technological, and legal issues when the parties work hand-in-hand.

No solution will be adapted by a port if it is only a brilliant concept that is not capable of generating revenues or savings. A future-fit solution must serve a common aim for both the port and its community. One example would be Rotterdam's Pronto – an application for port call optimisation. It has already started bringing the planned economic benefits by reducing the average port waiting time for ships by 20%.

Even if economic requirements are met, ports will have to face technological challenges. One thing is ensuring the unified standards and definitions so that a neutral digital platform can be used by many players. Here, the International Taskforce Port Call Optimisation brings together standards from the nautical sector. The organization is represented by such bodies as shipping lines, oil tanker owners, terminal operators and ports, and co-operates with the International Harbour Masters Association, the United Kingdom Hydrographic Office, and GS1.

Another challenge lies in ensuring that the technology used is safe. In an interconnected digital platform, any lack of proper security measures on the part of a single organisation can jeopardise the whole pack.

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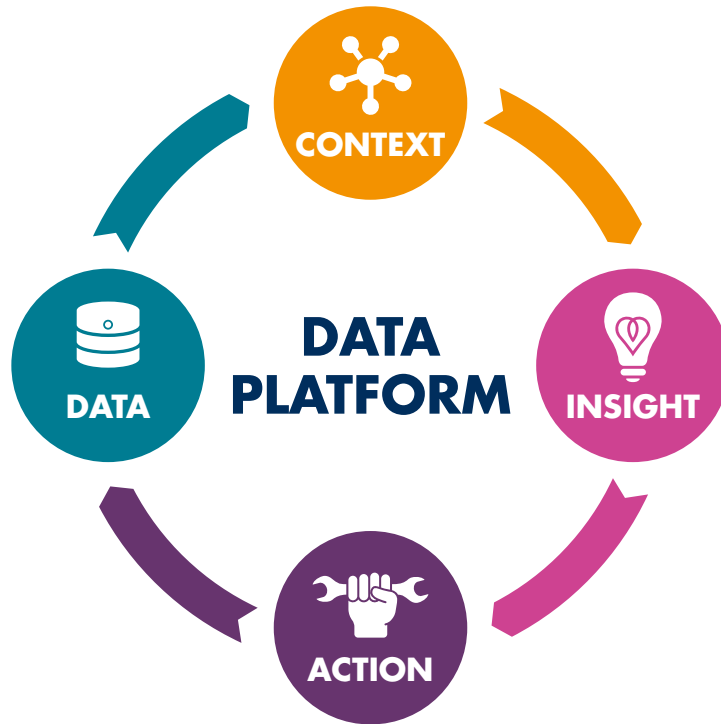
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Cybersecurity requires companies to invest financially, technologically, and culturally, and needs to be prioritised as the connectivity of assets – the Internet of Things – grows.

Even if the data is safe, its accessibility and reliability remain a concern. On a digital platform, data must be available all the time. Even temporary interruptions in data flows may have a major impact for all of the platform's members, so ports need to invest in reliable business continuity protection.

Accessible and reliable data should be available but only to the intended recipients. The aspect of privacy is even more important now, after the introduction of the General Data Protection Regulation across the EU in May 2018. In the maritime industry, these rules are applicable to the automatic identification system (AIS) signal from inland vessels, among others. Because many such vessels are private, the use of AIS data to facilitate cargo handling or to collect port dues automatically should be used only with the consent of the vessel owners.

This shows that there is a need for rules on data ownership, and access and user rights to be laid down. Terminals and

vessels carry confidential and commercially sensitive data, which should be limited only to the authorised parties. Another example is the information on completion times of terminal operations, which in some cases is commercially sensitive, too. In such digital databases as the Port of Rotterdam's systems PortInsider and PortBase, security is prioritised by requiring identification, authentication, and authorization from its users. Sure, it requires going through a few more security steps, but that's still nothing compared to the time and effort saved thanks to the digital solutions made possible by PortInsider and PortBase.

The best time

When the tools are available, the funds are there, and the process is secure, it is time to display the skills necessary to make the digital future happen. Ports will need employees with strong data capabilities, who have IT background and are capable of handling smart digital applications. Analytical skills will also come in handy to work on historical data as well as create new/ alternative models and forecasts.

Before any set of data is transformed into action, it goes through a cycle. First,

the data are collected from the port community before being combined with other available data to create a context. Only then can the collected data be properly analysed and translated so that the consumer can start taking action. Such actions can bring about tangible effects, just like the one-off potential savings of €1.0m in Rotterdam, resulting from more efficient dredging based on combined operational and historical data (the solution has been transformed into the Optimised Dredging Application).

Before ports complete their conversion into data platforms with ongoing data use cycles, they need to lay solid foundations. To remain competitive and achieve greater efficiency, they have to start building the platform around talented employees, innovative ideas, and comprehensive troubleshooting.

There's no turning back from the digital revolution. The good news is that ports, be they big or small, can be leaders of change in the maritime industry, not victims of the inevitable. So, the modern version of the well-known Chinese saying would go like this, "The best time to go digital was 20 years ago, the second-best time is now." ■