

Embracing technology

The industry is facing a set of emerging challenges including growing freight traffic, increasing pressure to address environmental concerns, and critical operational challenges while delivering services. To overcome these challenges, the past few years have seen an increase in investment centered on the adoption of smart port technologies and integration of the value chain with digital platforms. With the ongoing pandemic, the dependence on technology has grown exponentially.





Adoption of smart ports technologies

Leading ports are leveraging the Internet of Things (IoT) for live-tracking of cargo status; blockchain for supply chain optimization; drones for operational oversight and environmental safety; high bay storage systems for container handling; and data analytics for deriving data-driven insights for internal/external customers.

IoT can be considered the cornerstone of this transformation due to the clear need to digitize the delivery process for monitoring cargo and deliveries with the aid of smart sensors. The port of Hamburg, the third busiest port in Europe, initiated a strategic program in 2011 to evolve into a “smart port” to optimize capacity and maximize efficiency. This was achieved through the adoption of IoT technology in the port ecosystem by installing sensors to monitor the use of physical assets (e.g. trucks, cranes, carriers, roads, warehouses, etc.), using GPS, and geo-referencing to monitor movement of traffic.

Blockchain technology has the potential to digitalize supply chains, eliminate record-keeping efforts, promote paperless transactions, and streamline the supply chains by enabling real-time communication. In 2017, the port of Antwerp announced a pilot project for more efficient and secure container handling leveraging blockchain technology in collaboration with NxtPort. The data utility platform being developed will collect and pool data from various stages in the supply chain of the Port of Antwerp.

Drones are quickly becoming a regular tool in the ports and logistics industry. Ports are using drones in their routine monitoring to improve safety, reduce costs and enhance process efficiency. Around the world, from the Netherlands to Vietnam,

ports are using Airobotics drones for controlling aerial cargo transport, monitoring ships, cleaning the local environment and tracking the construction of ports.

High Bay Storage (HBS) system is an automated container handling system that stacks containers up to 11 floors high, delivering more than three times the capacity of a conventional yard with enhanced performance including significant gains in handling speed, energy efficiency, safety and reduced operating costs. DP World recently commenced its pilot phase of BoxBay (a high bay storage system) to reduce by at least 70% the land area needed to support terminal operations, and increase yearly yard throughput per hectare by more than 300% in comparison with a Rubber Tyred Gantry Crane (RTG) container yard.^{xxxvi}

Data and analytics applications are allowing supply chains to adopt a proactive rather than a reactive response to supply chain risks. Singapore’s Maritime and Port Authority (MPA) established a data-enabled traffic prediction tool to forecast vessel arrival times and estimate potential traffic congestion using predictive analytics. The port of Hamburg in Germany uses analytics to aggregate various data points (i.e. vessel positions, height and width of bridges, etc.) to optimize internal port operations.

Additionally, smart ports are leveraging other technologies such as artificial intelligence (AI) to enhance predictive insights and cloud computing, data management and data sharing amongst various stakeholders. Robotic process automation (RPA) is being leveraged to automate processes across several support functions (Finance, HR, and Supply Chain Management).

Digitizing the trade and logistics value chain

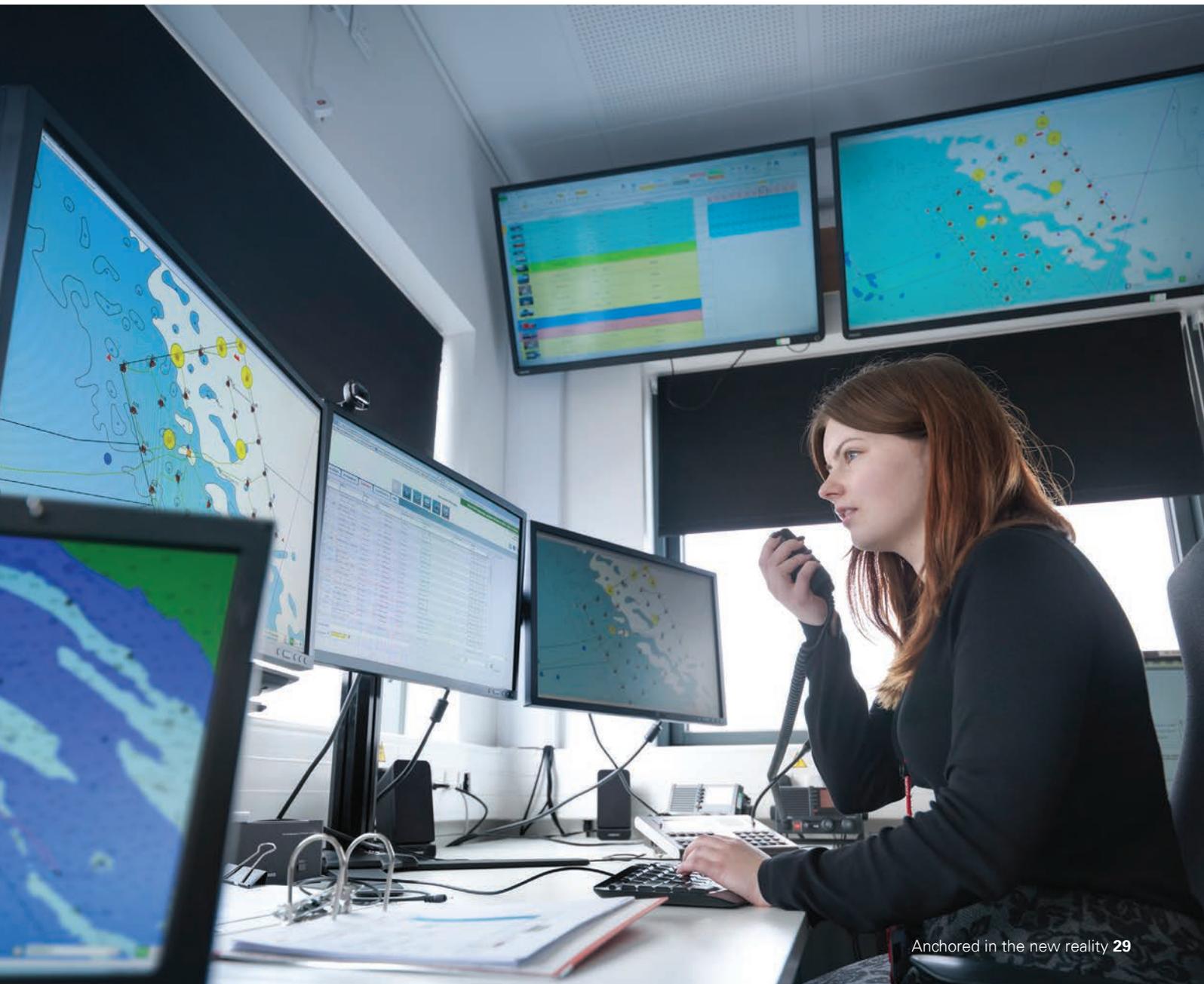
The new connected ecosystem of platforms is supporting the growth of maritime trade across the globe.

The **single window platform** integrates multiple systems to facilitate the exchange of information between port stakeholders e.g. port authorities, exporters, and importers. Countries such as Singapore and the Netherlands were able to solidify their competitive advantage over other key players by using an

intelligent single window platform for information exchange (the Port Community System) between governments and trade communities that would facilitate the creation of a transparent trade ecosystem.

Digital exchange platforms are being rapidly deployed by leading ports over the past decade. These platforms digitize the entire logistics supply chain by creating a marketplace for various sub-segments of the market. In 2020, DP World acquired

SeaRates.com, a digital platform that enables customers to transport cargo worldwide at the click of a mouse. DP World has also created the Digital Freight Alliance, an online association that brings freight forwarders globally onto one platform, giving them access to new tools, routes and services, and enabling them to do more business anytime.



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