

PORT
TECHNOLOGY



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THE E-JOURNAL
OF PORTS AND TERMINALS

SAFETY AND SECURITY

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FROM THE EDITOR

Margherita Bruno,
Editor



Welcome to this month's edition of PTI e-journal, where we delve into the realm of maritime safety and security.

In today's interconnected world, ensuring the safety and security of maritime trading systems is imperative. Port security encompasses a wide array of topics, ranging from cybersecurity to efficient cargo handling, all aimed at fortifying overall security measures.

We are honoured to have our sponsors, Nexxiot and Deloitte, introduce their KYX solution for the global supply chain. Addressing challenges encountered by European ports, KYX integrates various factors such as infrastructure, environmental regulations, competition, security and digitalisation to enhance transparency, compliance and sustainability within the supply chain through real-time data insights and advanced cargo tracking and security technology.

In the realm of fire safety for electric port equipment, Fogmaker International

emphasizes the necessity of robust fire suppression systems amid the transition to electric-powered machinery. Our official section sponsor offers high-pressure water-based mist fire suppression systems, providing effective solutions to mitigate fire risks on a global scale.

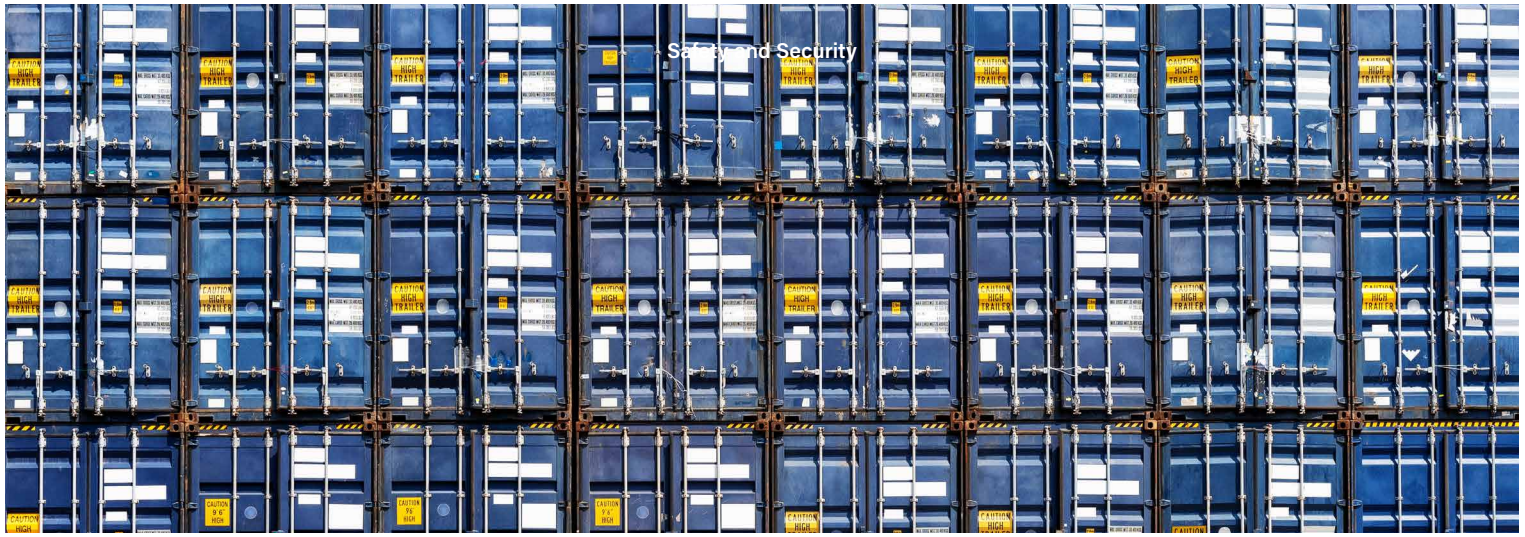
Our journal further showcases advancements in port security, spotlighting innovations such as Porto Itapoá's inventive rescue cage and Antwerp's 'D-Hive drone-in-a-box' network, enhancing situational awareness. Additionally, EyeSeal's container breach detection device plays a pivotal role in fortifying global commerce security by delivering real-time monitoring of container parameters, ensuring unparalleled cargo visibility and security.

As we shift our attention to the maritime industry, cybersecurity and risk management experts Richard Oloruntoba and Ed McNamara emphasize the importance of protecting against cyber threats. Oloruntoba

suggests a comprehensive approach to managing port security threats, while McNamara provides insights into effective port cyberattack insurance coverage. Both experts stress the need for continuous improvement of cybersecurity capabilities and vigilance against evolving threats. Cybersecurity is crucial for the maritime industry; in our last contribution, Marlink advises on preparation, compliance and awareness to counter cyber threats. With digitalisation, cybersecurity is a top priority to ensure business continuity and reputation. A coordinated approach is essential to mitigate risks and uphold the integrity of maritime operations.

We express our gratitude to all our contributors for sharing their priceless insights. Their contributions are essential in shaping a safer future for those navigating the maritime landscape.

Thank you for joining us on this journey! We hope you find this edition informative and enlightening.



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SUPPLY CHAIN TRANSPARENCY

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KYX: TRANSPARENCY, TRUST AND EFFICIENCY FOR THE GLOBAL SUPPLY CHAIN OF TOMORROW

- ✔ Container Safety Verified
- ✔ Approved for Green Lane



**“THIS NEW KYX OFFERING AIMS TO MEET SUPPLY CHAIN
TRANSPARENCY, COMPLIANCE AS WELL AS SUSTAINABILITY DEMANDS.”**



Deloitte.

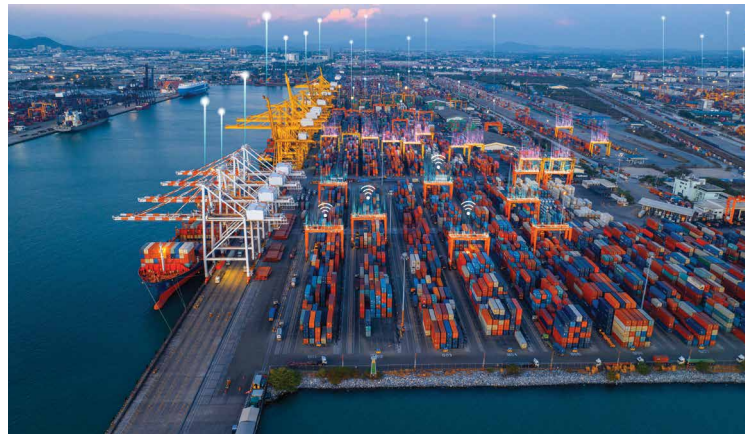


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Werner Fontanive, Fellow at the Center for the Edge, Deloitte, and **Stefan Kalmund**, CEO, Nexxiot

The global supply chain, a dynamic web connecting the farthest reaches of the world, orchestrates the movement of goods with precision and efficiency. Within this complex environment, international ports serve as gateways and nerve centres through which the ecosystem is orchestrated, thereby ensuring the seamless flow of commerce across borders. European ports are facing significant challenges that are affecting their efficiency and competitiveness, similar to ports around the world. These challenges include:

1. **Infrastructure:** Many European ports are facing infrastructure challenges, including outdated facilities, insufficient capacity, inefficiencies and hence underleveraging the actual capacity they have available, and inadequate connections to other transportation modes. This leads to congestion, delays, and increased costs for shippers.
2. **Environmental regulations:** Notably European ports are subject to strict environmental regulations, which can increase costs and limit the types of cargo that can be handled. For example, ports may need to invest in new equipment or technologies to reduce emissions or comply with waste disposal regulations.
3. **Competition:** European ports increasingly face competition from other ports around the world, particularly in Asia and the Middle East. These ports may have lower costs, more modern facilities, and better connections to other modes of transportation,



4. **Security:** European ports must comply with strict security regulations to prevent terrorism, illicit trade, contraband, trafficking, and other threats. This can increase costs and lead to delays for shippers, particularly if cargo needs to be inspected or screened and this is done in a sub-optimally organised manner.
5. **Digitalisation:** European ports are increasingly adopting digital technologies to improve efficiency and competitiveness and they still rely heavily on human-based processes. However, this requires significant investment in new technologies and infrastructure, as well as training and development for staff.

All together, these challenges require significant investment in new infrastructure, technologies, real-time data-driven insights, training,

and more to ensure that European ports can continue to meet the contemporary needs of the global supply chain and remain successful in an increasingly competitive market.

Over recent years, one could witness the emergence of a broad range of initiatives and stand-alone solutions. For these to be truly successful and reach their full potential, at Deloitte we are convinced that a high level of integration into a wider and broadly adopted ecosystem is quintessential. To date, a positive trend in this direction can be recognised; with several European ports leading the way by having launched several initiatives to address these challenges.

To carry this further, optimise investments and be cost-efficient, Deloitte has devised an overarching and agnostic industry approach, allowing it to extrapolate existing and proven market capabilities into one common service model, called the "Deloitte KYX offering". Combining Deloitte's Know Your Client (known



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“THE IMPLEMENTATION OF THE KYX SOLUTION, EVEN IN A PARTIAL MANNER, CAN EFFECTIVELY LOWER THE RISK OF FRAUDULENT ACTIVITIES AND ENHANCE SECURITY MEASURES IN PORTS.”

as KYC) concept and expertise with its views on knowing your cargo, the KYX concept brings new and broadly adaptable data-driven services, utilities, and platforms into the market – combining with existing services where applicable.

As a starting point for exploring and further designing the KYX offering, amongst others, Deloitte is currently teaming with the companies Nexxiot and Pairpoint. By combining Deloitte’s Know Your Customer (KYC) capabilities with Nexxiot’s insights around Asset Intelligence Devices and Pairpoint’s knowledge on EoT technology and data verification capabilities, a best practice standard is being established with the ambition to allow each party in the logistics chain to gain real-time insights; which in their turn will open the door for a myriad of relevant use-cases such as around enhanced data provenance, cargo transparency, improved operations, increasing

regulatory compliance, and others. This new KYX offering aims to meet supply chain transparency, compliance as well as sustainability demands. It is designed as an open standard and open platform, to ensure broad future development and deployment as well as strong market penetration and acceptance.

KYX involves collecting, verifying and making available information about the cargo being transported, including its provenance, destination, contents, status, location, exporter, importer, Ultimate Beneficial Owner (UBO) and many more information elements. This information is then used by stakeholders in the ecosystem to ensure that the cargo complies with all relevant regulations and standards, for example.

To feed KYX, Asset Intelligence devices can be used to oversee the payment-goods transport cycle. These devices provide complete traceability of all movements,

changes and handling of the asset across its entire journey. They have the capability of pinpointing delays in the supply chain to certain parties and locations, as well as confirming that transshipments were made at approved or official transshipment stations, such as free ports. Additionally, they can substantiate that the cargo did not unexpectedly and suspiciously stop somewhere along the route, where it could have been contaminated or exfiltrated.

As an additional feature, these devices can ensure that containers and the assets they contain are always sealed during the journey, except on approved occasions. As such, KYX also involves meeting inspection and screening of cargo requirements. Cargo must be inspected and screened to ensure that it complies with relevant regulations and standards. This includes checking for prohibited items, such as drugs and weapons, and ensuring that the cargo is

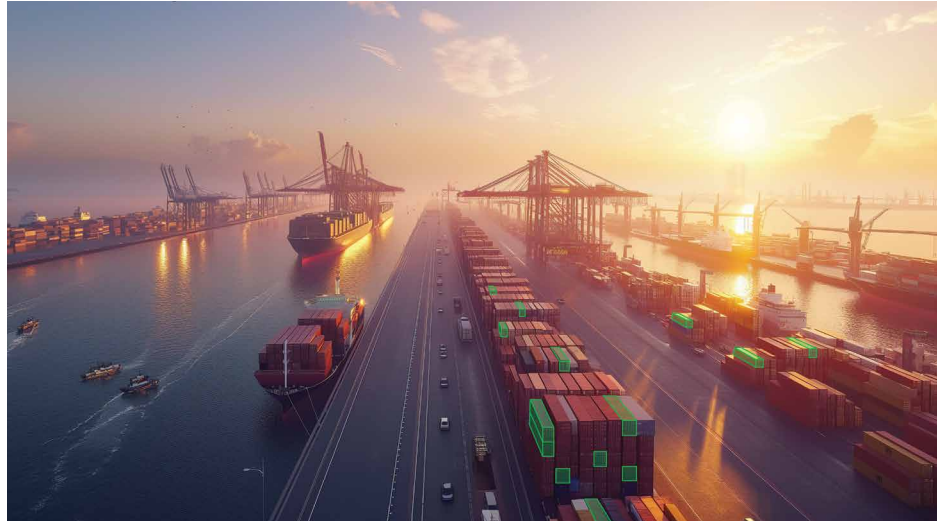
consistently, fully labelled and packaged.

Meeting the aforementioned container security and tracking requirements necessitates the use of smart technology, such as GPS tracking and RFID tags, to monitor the location and condition of the container.

One specific use case for the solution is the efficient processing of goods in ports and the clearance from customs on the on- and off-boarding, within the framework of so-called green lane objectives. The KYX solution can help ports speed up the clearance process for goods, reduce waiting times and improve the overall efficiency of the port, including cargo inspections. By using smart connected sensors, KYX provides real-time data on the location and condition of cargo, allowing port authorities to quickly identify any issues and take the appropriate action.

The implementation of the KYX solution, even in a partial manner, can effectively lower the risk of fraudulent activities and enhance security measures in ports. It also leads to more efficient interventions and operations. By verifying the provenance of data on the movement, content and status of cargo, KYX can ensure that only legitimate goods are cleared for entry into the port. This helps to prevent the entry of counterfeit goods and other illegal items, making it less dependent on the intervention of stakeholders and thereby also improving the overall safety and security of port workers and the wider hinterland community.

KYX is designed to support the needs of customs and other regulatory authorities in European ports whilst at the same time bringing benefits to global supply chain efficiency and transparency for all other stakeholders involved, including port authorities and operators themselves. These ports have specific requirements for cargo entering and leaving their facilities, and these requirements must be met to ensure that the cargo is transported safely and efficiently,



ABOUT THE AUTHORS:

Werner Fontanive is a Deloitte Fellow at the Center for the Edge identifying and exploring opportunities on the edge of business and technology. As a transformation partner, he engages company leaders, unlocks innovation potential and drives growth.

Stefan Kalmund is the CEO of Nexxiot. Passionate about technology, growth and making a positive impact on how cargo is shipped, Stefan captures global megatrends and constantly searches for ways to deliver unparalleled insights to clients.

ABOUT THE COMPANIES:

At the Deloitte Center for the Edge, we connect edges to accelerate impact. We partner with senior executives to make

sense of and profit from emerging opportunities on the edge of business and technology. We help leaders understand the fundamental changes shaping the world, navigate the short-term challenges and identify long-term opportunities.

Nexxiot is digitalising freight transportation with technology that now oversees the world's most extensive network of connected shipping containers and railcars. Clients gain access to unparalleled real-time data, which streamlines fleet management and automates logistics processes. Our devices, built for resilience, withstand extreme conditions and provide long-term, detailed insights into events affecting containers and railcars, including impacts, delays, security incidents and loading activities.

“KYX IS DESIGNED TO SUPPORT THE NEEDS OF CUSTOMS AND OTHER REGULATORY AUTHORITIES IN EUROPEAN PORTS WHILST AT THE SAME TIME BRINGING BENEFITS TO GLOBAL SUPPLY CHAIN EFFICIENCY AND TRANSPARENCY FOR ALL OTHER STAKEHOLDERS INVOLVED.”

A DEEPER LOOK INTO THE KYX SOLUTION



Deloitte.



nexxiot

Margherita Bruno, Editor, Port Technology International, interviewing **Werner Fontanive**, Fellow at the Center for the Edge, Deloitte, and **Stefan Kalmund**, CEO, Nexxiot

How does the KYX offering address challenges to European ports, such as infrastructure, environmental regulations, competition, security and digitalisation?

Stefan Kalmund: European ports are undergoing a transformational phase, where they are solving various challenges to enhance their efficiency and connectivity.

They are addressing the need to modernise ageing infrastructure, improve connections with other transportation modes and expand capacity to meet growing demand. Ports are actively working to strengthen security measures, manage risks and ensure safe operations. They are also acting to accelerate the pace of digitalisation.

The KYX offering takes a holistic approach integrating the needs of all supply chain participants, including European ports. This makes it possible for them to

access the services they need from a single trusted platform.

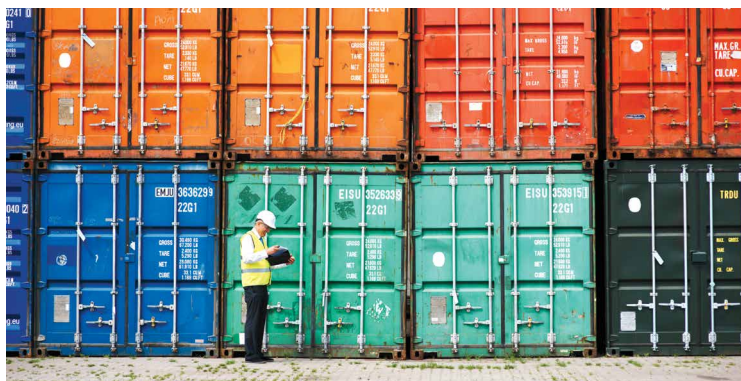
By creating pragmatic quality standards in hardware, software and analytics, the technology is accepted by ports because it is safe, secure and interoperable. By creating a solution for device management, data management and flexible access via standard interfaces (APIs), stakeholders are provided with consistent and reliable data.

Ports are enabled to be more nimble, reliable and competitive in pricing to outmanoeuvre competition. Increased asset intelligence offers ports enhanced security capabilities, and greater efficiency in port processes improves the speed and accuracy of handling to reduce errors and delays. Improved visibility also helps to overcome the problem of inadequate connections to other transport modes as assets can be located and aligned with trucks, trains and barges with greater precision.

What are the benefits of the KYX solution for different stakeholders in the supply chain, including port authorities, shippers, customs and the wider community?

Werner Fontanive: One of the most significant benefits of KYX is the financial oversight it provides on all transactions and processes across the supply chain. From the purchase of goods to the financing of the shipment, the transfer of ownership, and the insurance to safeguard the goods - everything needs to be monitored and managed.

With a trusted Banking Financial Service and Insurance Industry (BSFI) 'golden record' for all aspects of the shipment, stakeholders are fully supported. This includes 'Know Your Customer (KYC), Know Your Suppliers (KYS), Know Your Suppliers Supplies (KYSS) to KYCC (Know Your Clients Clients). The benefit to stakeholders



is that contemporary and future regulatory demands in global finance and trade can be met. Through the same KYX offering, Carbon Footprint Monitoring is also within scope.

Ocean carriers, cargo owners and other logistics stakeholders benefit from the KYX offering because it makes physical and business processes faster, more accurate, trusted and validated. Cargo routing, handling and a wide range of other processes benefit from digital monitoring and sharing of this and other data. Unplanned stops, door-opening events, audit issues, cargo declarations, pre-trip inspections and customs risks are all made more transparent and manageable. Innovative practices like setting up green lanes for customs-approved goods, which make the processes around shipments faster, are also enabled.

Services around exception management, notifications on potentially fraudulent actions, self-clearing systems, geofencing, complex event processing and dynamic ETAs all act to enable stakeholders to get a clearer view of their operations, automate processes and create more accountability and trust.

How does the partnership with Nexxiot enhance the capabilities of the KYX offering, and what role do their technologies play in improving supply chain transparency and efficiency?

WF: The partnership with Nexxiot is vital for the KYX offering as it provides a bedrock of highly reliable technology, quality data

and a long hardware lifetime. The KYX offering requires a technology partner with experience in large-scale device deployment.

Nexxiot's hardware devices are robust and resilient in their physical toughness, they offer global coverage and quick installation, making them ideal for multiple journeys over several years.

The approach Nexxiot took in terms of integration is also vital for success. This is done using an open architecture to connect other sensors to the gateway and the platform with other systems like those for global trade finance, freight forwarding, road, rail and carrier operating systems.

Nexxiot's solutions offer multiple value drivers including those centred on optimising carrier processes and supply chain operations. They also offer the opportunity to rapidly create new services for other stakeholders in the value network.

Could you elaborate on specific examples or case studies where the KYX solution has been successfully implemented in European ports?

WF: The KYX offering is currently in the design and build phase. The group is working with regulatory bodies and participants across the supply chain ecosystem to ensure global acceptance.

As the KYX solution is deployed, we can see many opportunities for European ports to benefit in the ways mentioned before.

The KYX offering does not depend on replacing existing infrastructure but offers a completely integrated solution for the market. As we have

seen, Hapag-Lloyd has now digitised its entire container fleet, so we will start to feel the network effects of more and more assets being equipped, and more use cases being addressed with specific products.

How does the KYX solution ensure data integrity and security while collecting and verifying information about cargo, especially considering the increasing concerns around data privacy and cybersecurity?

SK: To ensure data integrity and security Nexxiot uses end-to-end encryption on all data that is generated on each device. Furthermore, all data is signed by a third party on the device to guarantee that no modification has taken place in flight or at any later time. This means that participants and users can trust the data and concerns around privacy and security are managed.

How does the KYX offering align with existing industry standards and regulations related to cargo handling, security and customs clearance in European ports, and what steps are taken to ensure compliance with these standards?

WF: Most of the processes around cargo handling, security and customs clearance are manual, siloed or localised. The KYX offering is using a digital, financially approved framework to enable new, faster and more transparent processes to be devised. By working closely with the regulatory bodies and market participants we can revise the industry standard with real live asset data as the benchmark for approval.

We have witnessed changes to EU customs legislation which is facilitating the use of supply chain monitoring hardware for international shipping journeys to and from the EU. Devices used are intrinsically safe and can therefore be used in a wide variety of industrial environments from ports to petrochemical plants.