

DATA QUALITY AUTOMATION: THE KEY TO FUTURE-PROOFING THE MARITIME INDUSTRY



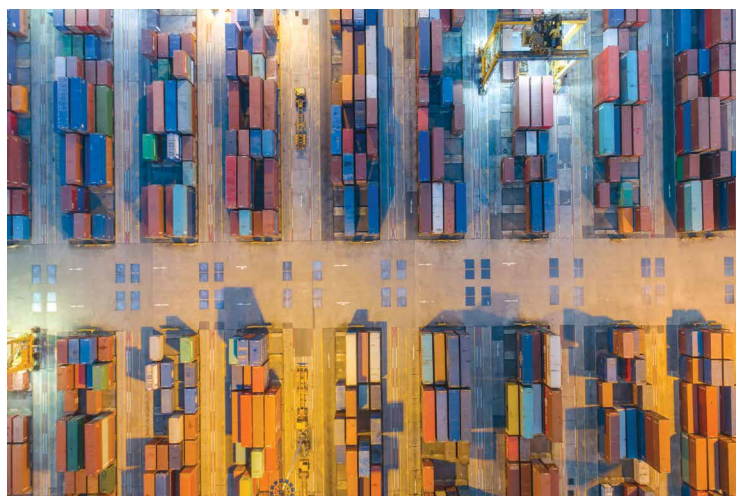
Kevin Martin,
CEO, One Digital Nation

As we all gather in Rotterdam for the eighth edition of Smart Digital Ports of the Future, it is interesting to note the key topics for discussion this year—Digital Twins, IoT, Artificial Intelligence, and the role of digitalisation in achieving sustainability goals. Each of these topics highlights the technological ambitions of the maritime industry, but they are all underpinned by a single, unifying element: Data.

These technologies are not just passive users; they actively consume, transform and generate vast amounts of data. We're talking about millions of terabytes, often structured, sometimes semi-structured, but mostly unstructured. One would be forgiven for thinking that, given the critical role data plays in successful technology adoption, achieving goals, gaining a competitive edge, and even in day-to-day operations, good quality data would be a top priority for every organisation.

And yet, for many, it continues to be as elusive as it is essential—a challenge that demands urgent attention if we are to fully realise the potential of these emerging technologies. Why is that?

The complex nature of data is one answer, but there are more fundamental challenges. The cost of implementing and maintaining Data Quality Management systems; skills, processes, and resource requirements; data silos; integration challenges; the sheer volume of data – all of these combine



to complicate efforts to create a cohesive data strategy. Often, though, data initiatives are hindered by established organisational habits and a reluctance to change.

The picture isn't all bleak, though. The opportunities that mastery of data quality presents are substantial. Properly executed, data governance and Data Quality Management can be transformational. Among the many benefits, accurate data enables informed decision-making, enhances operational efficiency, and ensures regulatory compliance. The cultural shift required for good data management empowers organisations to be more innovative, proactively adapting to shifting market conditions. Well-

managed data is more secure, can support sustainability objectives, and translates into measurable business outcomes.

The statistics speak for themselves. According to Forrester Consulting, 58 per cent of companies focussing on data are more likely to beat revenue goals than those that do not. BARC reports that businesses using data for decision making see, on average, a 10 per cent decrease in overall costs, with 69 per cent citing better strategic decisions, 54 per cent reporting improved control of operational processes, and 52 per cent reporting a better understanding of customers.

The stakes are high, but clearly, so are the rewards. Overcoming these challenges not only unlocks

“PROPERLY EXECUTED, DATA GOVERNANCE AND DATA QUALITY MANAGEMENT CAN BE TRANSFORMATIONAL.”

“JUST AS AUTOMATION CONTINUES TO REVOLUTIONISE PHYSICAL OPERATIONS, IT IS ALSO TRANSFORMING DIGITAL PROCESSES, SUCH AS DATA QUALITY MANAGEMENT.”

the opportunities of today but also sets the stage for the adoption of advanced and emerging technologies that can transform the industry.

But how can these obstacles be addressed?

Do you remember every piece of Smart Port literature you ever read, that cited automation as one of the key technologies of a Smart Port? Traditionalists may associate automation with yard equipment and cargo movements, but just as automation continues to revolutionise physical operations, it is also transforming digital processes, such as Data Quality Management.

For many, the barriers to entry into the world of good data quality are falling fast, most significantly the high costs of implementation and maintenance. Traditional approaches often require substantial investment in technology and highly skilled resources, putting them out of reach for smaller organisations or those operating lean teams. New methods democratise data management by leveraging advanced technologies to handle many of the more complex tasks that were traditionally handled by specialists. This makes the Data Quality Management role accessible to more employees,

simplified to a level where data management duties can be adopted alongside, or as part of, a more traditional role.

New systems are also designed to be user-friendly, adopting intuitive interfaces and automated workflows that reduce the dependency on technical expertise. By empowering employees with the tools to efficiently perform data quality tasks and by reducing the need for extensive training or specialised staff, Data Quality Management is now a more cost-effective exercise, even for organisations with limited budgets and resources.



Overcoming costs is a significant achievement. One would expect integration with legacy systems, such as those commonly found in ports and terminals, to be much more challenging. In fact, the task is far less daunting than it once was. Those legacy systems are typically built on similar proprietary database technologies, such as Oracle, SAP HANA and SQL – all of which offer standard connectors that facilitate easy integration with third-party applications. New tools break down data silos with multiple connections into discrete systems. Centralised data management, regardless of source, enhances overall data coherence, simplifies

the application of governance policies, facilitates data integration, and supports data consistency, setting businesses on the path to Master Data Management.

With integration challenges addressed, the next logical concern is how to manage the ever-increasing volume of data. After all, if people are good at one thing, it is hoarding vast amounts of data that is often duplicated, obsolete, redundant, or of no real value to the business. Once again, new tools rise to the challenge. It would take one employee 5,000 years to read one terabyte of data. Modern applications index it and turn it into a searchable resource in a matter of hours.

Speed and accuracy are critical in the modern business environment, and timely access to reliable data is a crucial competitive advantage. Automated tools perform data quality tasks around the clock, giving organisations the comfort that data is accurate, up-to-date and ready for use in the decision-making process.

In many ways, the principles that ports and terminals have applied to improve the management, maintenance, and operation of their physical equipment translate seamlessly to the digital realm. Concepts such as asset management, preventive maintenance, automation, and standardisation—the bedrock of efficient and reliable terminal operations—are just as relevant to digital assets, including systems and data.

If Data Quality Management is the equivalent of Asset Management, then monitoring and cleansing represent preventive maintenance, and where automation of the physical yard equipment reduces manual labour and increases safety, Automated Data Quality Management also reduces effort, reduces errors, and improves the overall safety of the business from a security perspective by helping to control access to data assets.

With the exponential growth of global data expected to reach 463 zettabytes by 2030, the need to adopt robust Data Quality Management strategies has never been greater. The sheer volume of data—much of it unstructured—creates a significant challenge that can't be addressed through traditional means and is only going to become greater. Moreover, increasing global regulation—such as GDPR and CCPA—makes data accuracy and compliance no longer a nice-to-have but a critical business necessity.

The cost of poor-quality data is staggering. Gartner, Inc., a global research and technology consulting firm specialising in



IT and supply chain functions, estimates it at \$15 million per year for large organisations. That doesn't only relate to financial losses, but also to lost opportunities, operational inefficiencies, and the erosion of trust that underpins decision-making. Put simply, the costs of poor data management are now too high to ignore.

If that isn't enough incentive, monetisation opportunities are beginning to emerge. Creators of large language models (LLMs) are reaching the limits of available data to train their systems on and considering the possibilities of synthetic data. Yet, the publicly available internet data they have been using until now represents less than half of the data in existence. These organisations, and others like them, are hungry for accurate, clean, and unique data in areas such as finance, healthcare, manufacturing, and logistics to train models for specific applications. The ability to capitalise on those opportunities could be a competitive advantage in an increasingly data-driven economy.

The adoption of data governance and the automated tools that support it is not just a tactical

response to the challenges of modern business, but a strategic imperative that will define the future success of strategic digital, sustainability, and growth initiatives. It will in turn support the advanced technologies that will drive innovation in the industry.

Automated Data Quality Management empowers organisations with the tools to maintain data at scale, enabling them to proactively adapt to changing market and regulatory conditions. Incorporating Automated Data Quality Management into a data management strategy future-proofs the business, enabling it to leverage emerging technologies and drive long-term sustainable growth through enhanced decision making.

As organisations navigate the complexities of the digital age, their ability to manage data effectively will determine their success. In short, Automated Data Quality Management is not just the key that unlocks the full potential of organisational data, but a competitive edge that will position the organisation as a leader in tomorrow's data-driven economy.

ABOUT THE AUTHOR:

Kevin Martin is a visionary leader with extensive technology leadership experience in ports and supply chains. Kevin has diversified from pure-play consultancy, forming One Digital Nation to pioneer innovative solutions that empower organisations to harness the power of current and emerging digital technologies for strategic growth and operational excellence.

ABOUT THE COMPANY:

One Digital Nation is an independent technology partner with three decades of experience in the application of digital solutions in commercial environments, including ports, terminals, supply chains, utilities and smart cities. They work with technology partners to provide proven, practical, digital solutions that deliver tangible results.

The company also provides a range of business consulting and technology outsourcing services to support ports and terminals with IT Strategy, Business Process Analysis and Design, Process Automation, IT Programme and Project Delivery, Software Development Lifecycle, Data Quality Management and Business Change.

**“THE ABILITY TO CAPITALISE ON THOSE OPPORTUNITIES
COULD BE A COMPETITIVE ADVANTAGE IN AN
INCREASINGLY DATA-DRIVEN ECONOMY.”**