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A SYSTEM OF ENGAGEMENT FOR PORTS

A New Way to Manage Complexity with Location Intelligence

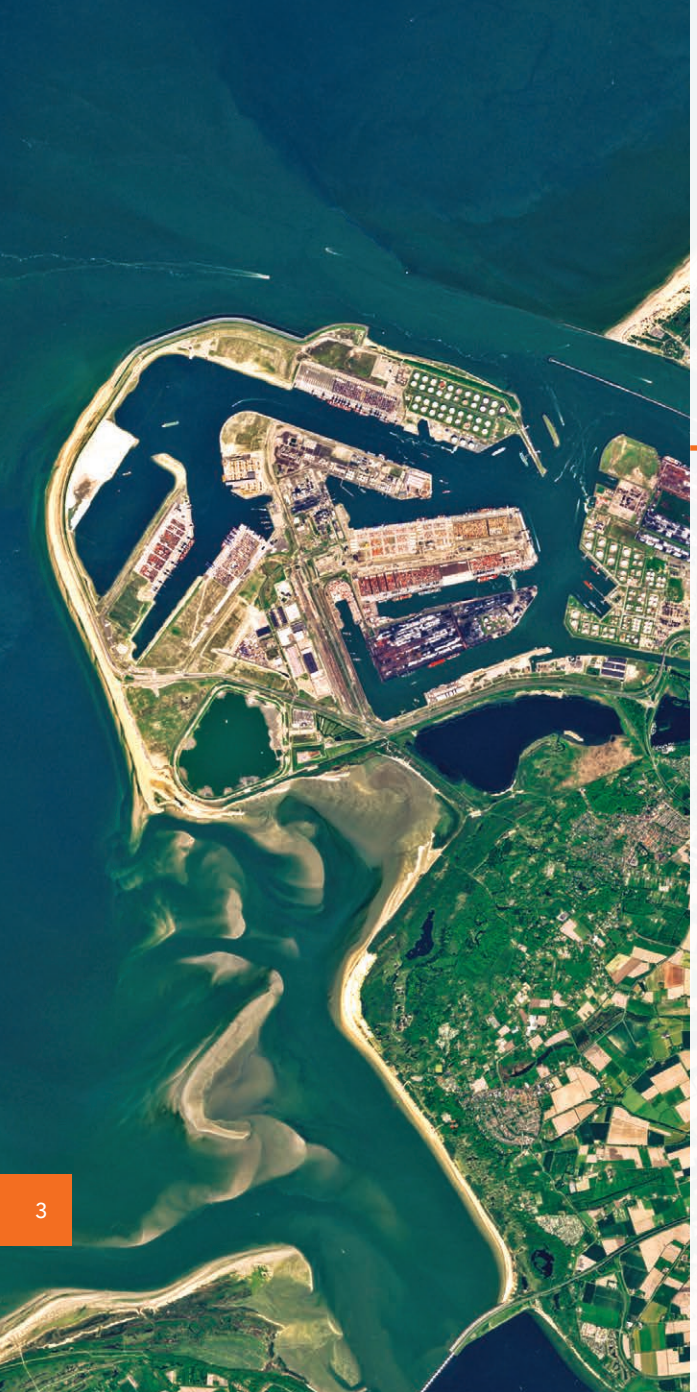
GAIN A COMPETITIVE ADVANTAGE WITH ESRI

Global ports have experienced profound changes over the past several decades. With increased global trade and constantly changing international supply chains, the maritime market is in a constant state of transition. To meet these challenges, stakeholders expect you to make smart and strategic capital investments in infrastructure and technology to sustain and prosper. To thrive in a competitive environment, ports must implement technology that

- Maximizes operational efficiency and throughput.
- Empowers everyone with the information they need to make better decisions.
- Facilitates collaboration and engagement with stakeholders.
- Helps ports play a more productive role in regional economies.

Location intelligence helps you meet those expectations by bringing together information from across your organization and visualizing your data to help you make the best decisions. It combines sophisticated digital mapping, big data analysis, and the ability to automate many processes that slow throughput and hamper the fiscal growth of ports.

This industry prospectus outlines the characteristics of smart ports as they face the challenges of digital transformation.



DIGITAL TRANSFORMATION IN PORTS

As one analyst remarked, "Just about every modern organization is scrambling to harness the potential of digital technology to get a competitive edge," and ports are no different. Given the rapidly changing environment most ports find themselves in, port professionals understand the need to leverage new technologies to improve performance and increase throughput, maintain their critical infrastructure, and ensure the safety and reliability of port facilities.

As a result, the role of a digital information infrastructure becomes the foundation for sharing real-time data across divisions and for gaining port-wide insights to drive better and more effective decision-making.

At the same time, it is easy to become overwhelmed with the sheer number of technology choices and strategies for achieving a successful digital infrastructure implementation. While what follows is not meant to address every one of these issues, it is designed to highlight a set of key strategies and characteristics that define many successful port digital transformations.

DIGITAL RISK MANAGEMENT

While many senior port executives may be convinced of the need for digital transformation, they are also faced with the dauntingly high failure rates of many such efforts among large organizations. And while there are many reasons for some of these failures, following some key strategies can greatly increase the rate of successful technology adoption.

First, it is important to understand that a digital transformation is more usefully understood as the process by which organizations leverage technology to more effectively improve their performance and to better achieve their mission goals. Understood in this way, it really is business transformation through the application of technology and involves redefining the interaction of people, processes, and technology, often with technology being the final piece of the equation.

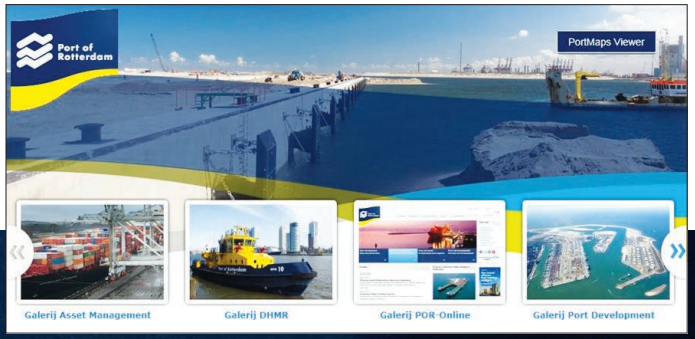
Second, a successful digital transformation strategy starts with a careful understanding of the problems to be solved, a thorough comprehension of the existing workflows and how they can be transformed, and a clear plan for achieving the objectives. Following a structured planning process can help ensure that the success of the agency's goals will be maximized.

And finally, the importance of focusing on the key priorities of the port—and closely aligning the digital strategy with those goals—can not be overstated. With the wealth of technology choices and the difficulty of bringing about cultural changes within a port, having a clear and strategic focus is critical.

What follows are key characteristics and concepts that smart ports must consider as they meet the digital challenge.

ACCESS TO INFORMATION

A central component of a successful information architecture is that everyone within an organization must be able to access the information they need to more effectively carry out their daily tasks. In most organizations, information is often siloed and not easily shared across their departments. But creating an effective information architecture requires the ability to bring together information from these various silos to support more collaboration and effective decision-making.



So first, there should be a single location for users (with appropriate permissions) to access authoritative data, using any device at any time. The core principle is that the ownership and stewardship of the data should remain with the group responsible for collecting and maintaining the data, but the data should be available from an easy-to-access site. And anyone should be able to get to the information they need with no more than three clicks from any device.

LEVERAGE EXISTING TECHNOLOGY

Most ports already have a large number of technology investments and management systems that contain critical data and information. The problem is that the data is not shared across their organizations in ways that can be used for more effective decision-making. Geographic information system (GIS) technology is perfectly suited to leverage more from your existing data systems. Because almost all data in a port has a location component, GIS can serve as the denominator between different datasets, allowing you to maximize the value of your data.

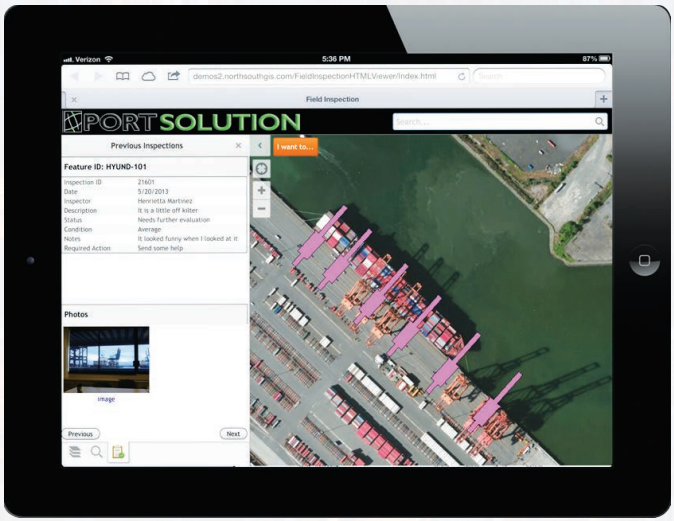
The goal is not to build new, large, complex systems but rather to leverage the data that you already have and to make it much more widely accessible. Fundamental is the notion that data should be unlocked and made widely available based on user credentials. Largely through creating open APIs between existing port management systems, bringing the data—including real-time data—into a common location brings new levels of control into a complex environment.

"Just as important, however, is that the cloud platform and the generated real-time information, which includes infrastructure, water, and weather condition data, enable us to further improve mission-critical processes in the service to our clients."

Ronald Paul
Port of Rotterdam's chief operating officer, describing the implementation of the port's Internet of Things (IoT) platform

SIMPLE, USER-FOCUSED APPLICATIONS

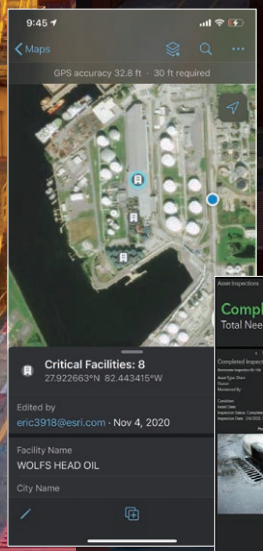
The data is exposed and made available through user-focused, simple applications that are designed to facilitate the daily workflow of various users. What we call a system of engagement creates targeted information products that are designed to provide data, maps, and apps to individual business units, allowing them to collaborate and bring the right information to their analysis and work. Esri's various applications are often connected to other applications, such that larger, complex workflows can be supported by a series of smaller, focused applications.

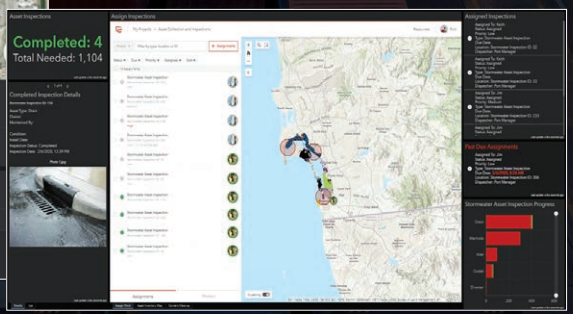


TAILORED APPLICATIONS

Another key concept is that user applications should be designed for very specific workflows and individual users. For example, maintenance staff who are inspecting port utilities or facilities need an application that is very simple and helps them efficiently collect the information, which is seamlessly updated in the corporate database. For the field personnel, a simple configuration of Esri's ArcGIS® Survey123 helps field crews quickly collect the information they need (including photos) and move on.

Meanwhile, supervisors do not need the field collection application but rather a dashboard that allows them to monitor progress. So a tailored application is configured for supervisors that gives them a real-time view of field progress and can generate any needed reports.

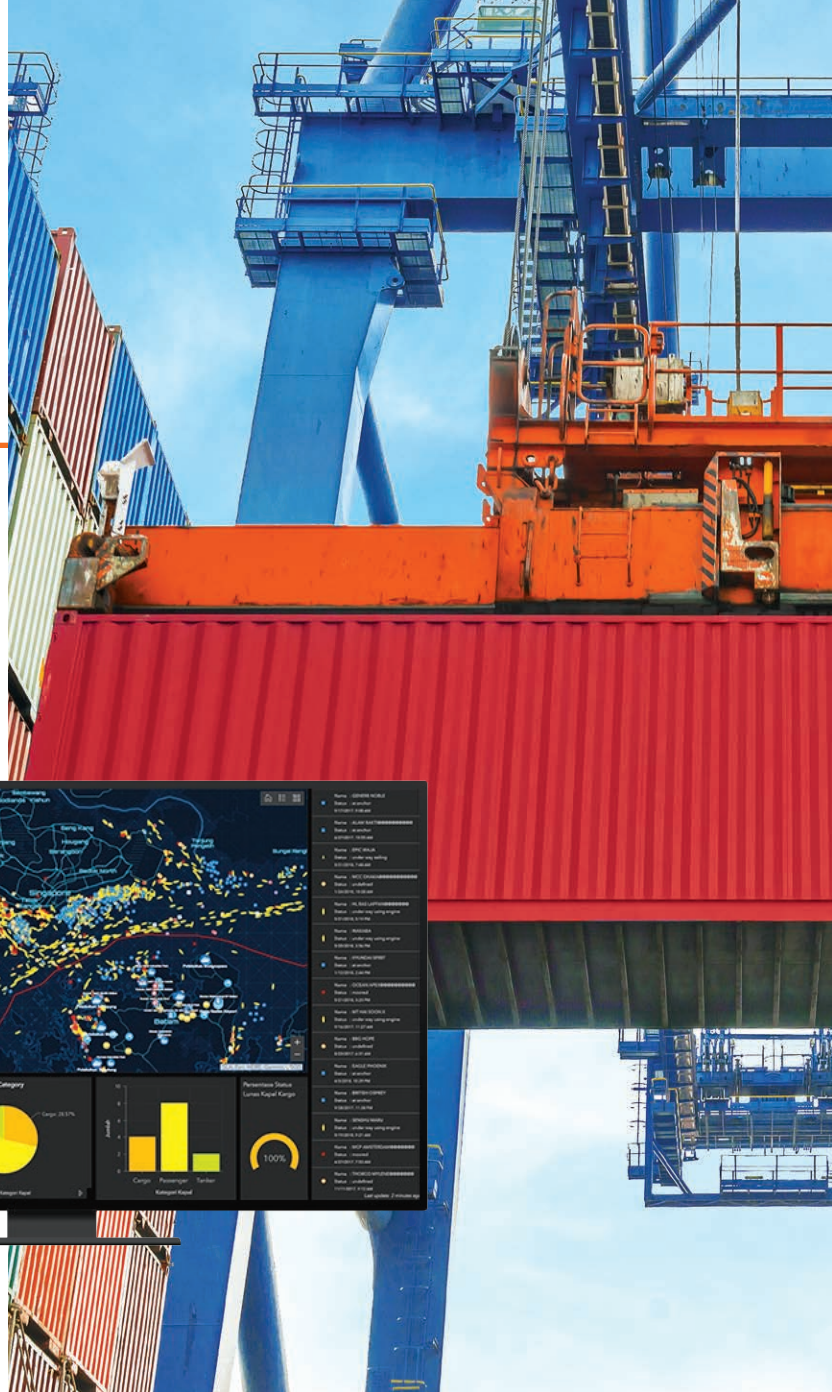




SUSTAINABLE TECHNOLOGY ENVIRONMENT

Because the focus of a system of engagement is to empower everyone within an organization with the relevant data and information they need for their daily workflows, the system is designed to create a sustainable technology environment that provides continual innovation.

The design and build of the technology environment are driven entirely by user needs. Once it starts enabling staff with the information and targeted applications designed to support their daily workflows, it becomes a continual process of refinement and improvement. The system of engagement helps redefine how people are connected to information, with the goal of increasing business efficiency and performance.



THE ADVANTAGES OF OFF-THE-SHELF TECHNOLOGY

Esri's system of engagement is designed to reduce the risk of failure—relying on configurable, off-the-shelf technology (the ArcGIS system) as much as possible. Esri has a large number of prebuilt templates and applications that are designed for easy configuration and quick implementation, with no need for custom coding. These cover everything from mobile workflows, operational awareness, and business dashboards to constituent engagement applications.

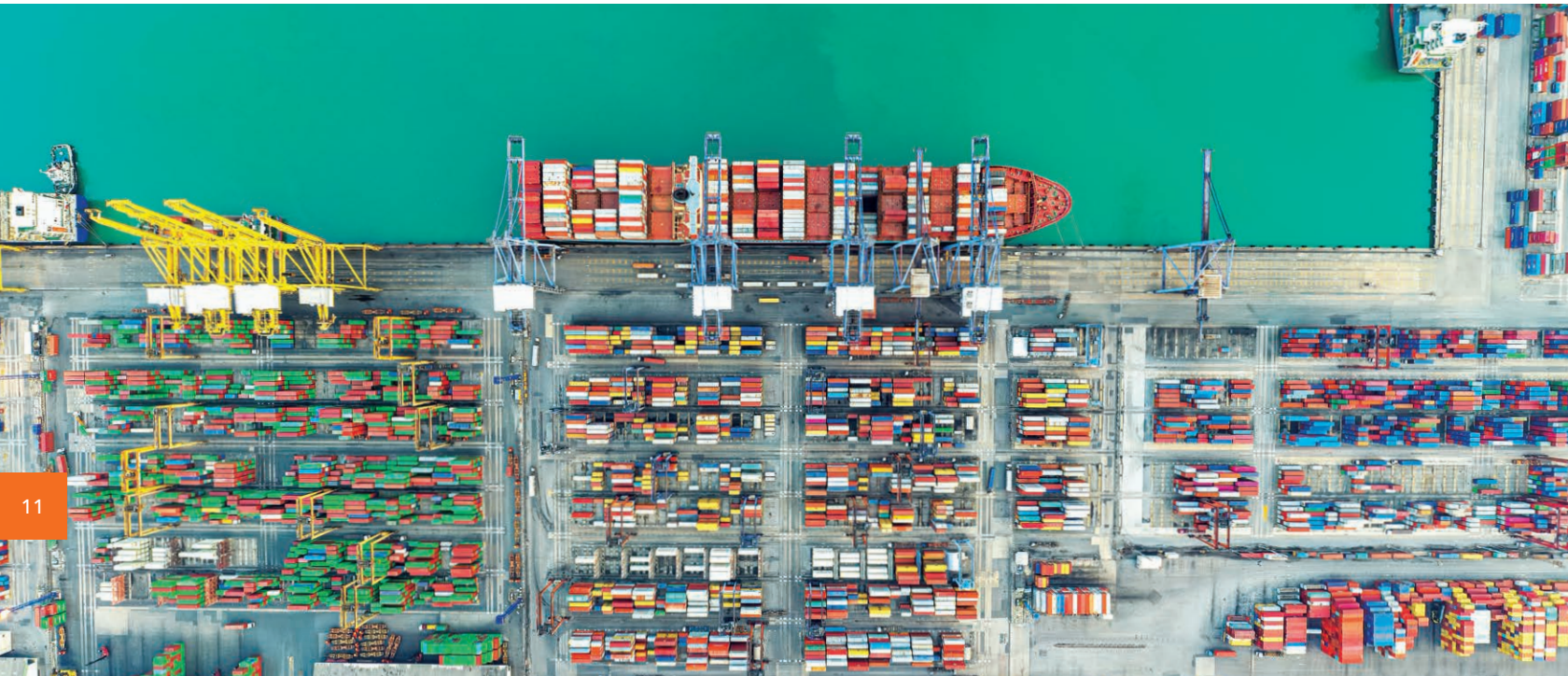
LET YOUR PORT THRIVE WITH ESRI

With the power of location, your organization can take the steps toward becoming a smart and thriving port. Esri's ArcGIS is a full software solution—with mobile, desktop, server, and online components—working to bring all your business systems into one dynamic information engine. Understand your business data through information-driven maps and spatial analysis. See where you excel, and assess where you can improve performance.

GET STARTED TODAY

Creating your system of engagement is possible.

For more information,
visit **go.esri.com/smart-ports**.



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