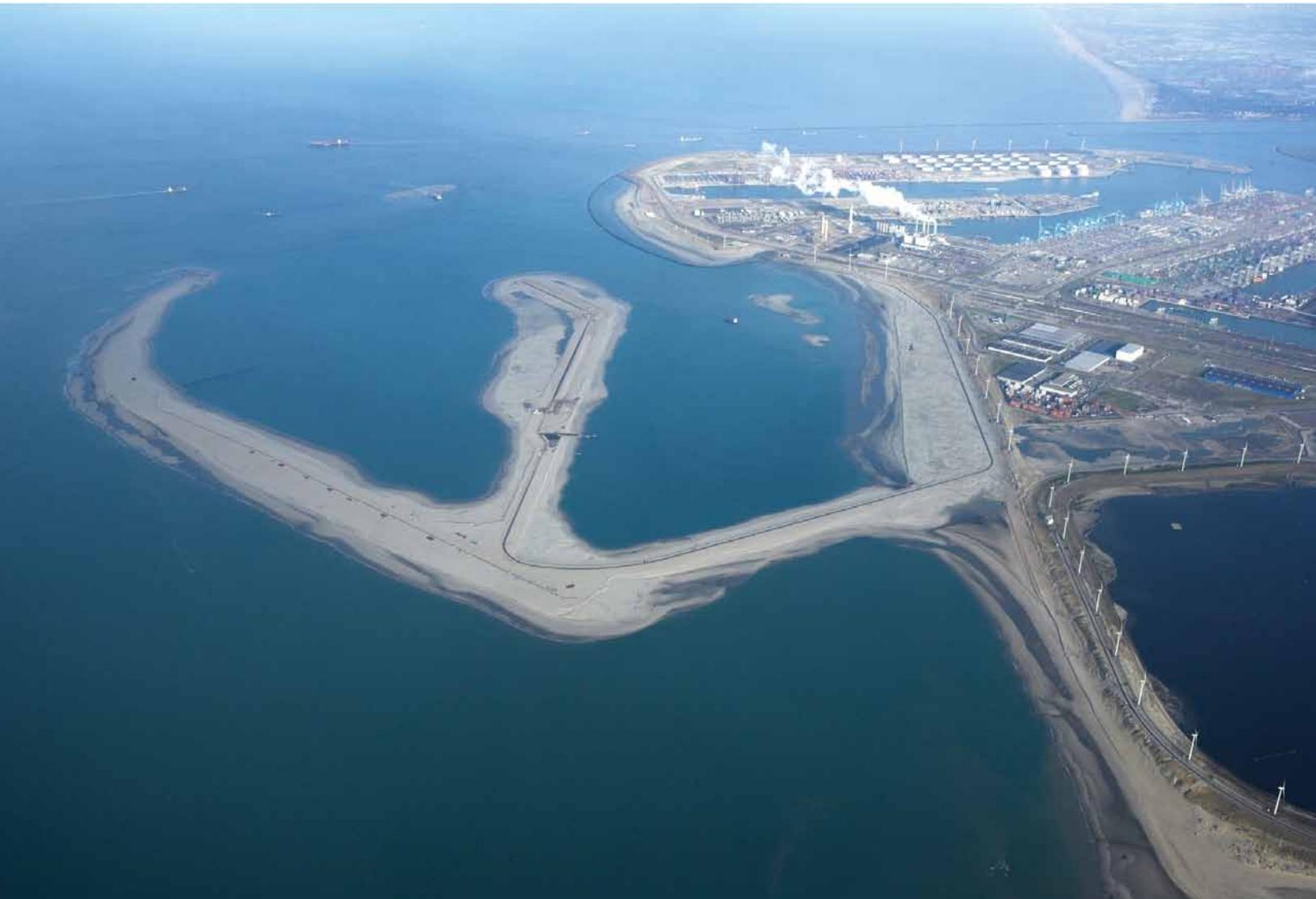


CASE STUDY:

FACILITATING SPATIAL DATA MANAGEMENT AT PORT OF ROTTERDAM, THE NETHERLANDS



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ERDAS APOLLO: FACILITATING SPATIAL DATA MANAGEMENT AT PORT OF ROTTERDAM

Directly situated on the North Sea and stretching 40 kilometers in length, the Port of Rotterdam, NL (PoR) is the largest seaport in Europe and one of the busiest ports in the world. A 24/7 global gateway and massive transshipment point, it serves to swiftly and efficiently distribute goods to hundreds of millions of European consumers. The port's massive industrial complex provides an intermediate destination for storage, cargo handling, processing and also distribution via various other forms of transport including road, rail, ship, river barge and pipeline. Goods arriving in the port in the morning may be in the hands of merchants in the heart of Europe and the UK by mid-afternoon.

MISSION OF THE PORT OF ROTTERDAM AUTHORITY

The Port of Rotterdam Authority strives to develop and advance Europe's leading seaport. The Authority facilitates and supports businesses in the port area, and acts as the manager of the port. Focusing on space and infrastructure planning and logistics, the Authority is responsible for creating optimum conditions for onsite business locations and accompanying residential environments.

SYSTEMS INTEGRATION TREND IN THE SHIPPING INDUSTRY

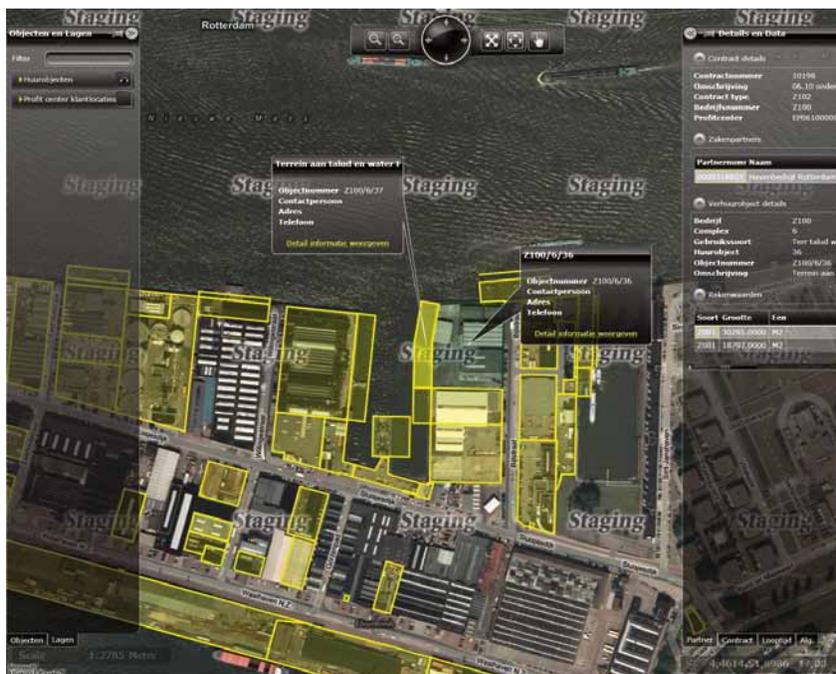
In the past decade, the shipping industry entered the digital age, and information management has progressed immensely. The digitization of data and ability to transfer information more freely has led to the unification of formerly independent systems. Systems integration and centralization has swept across port operations, and even encouraged cooperation beyond corporate borders.

SPATIAL INFORMATION MANAGEMENT

Port of Rotterdam's Spatial Information Management handles the internal processes at the port, including guidance of ship movements, commercial processes, infrastructure management and strategic planning. More than a decade ago, PoR made the strategic decision to implement one single, organization-wide database, providing the entire operation with a comprehensive information package. This centralized approach seeks to make newly published data and information immediately available to all relevant departments.



Officers at the Port of Rotterdam monitor all ship movements on wall-size video screens.



The biggest challenge was combining the information from these different sources in a clear and easy way, so that both technical and also non-technical (i.e. commercial) staff could have access to this information without specialized applications.

Spatial Information Management also provides PoR with correct and appropriate geospatial information for its commercial processes. “As part of the port’s centralized information solution, Spatial Information Management delivers spatial information systems for harbor traffic, leased harbor parcels, asset management and current projects in progress,” said Albert Mulder, Spatial Information Manager at Port of Rotterdam.

To date, Spatial Information manages over two million spatial objects, totaling over a hundred gigabytes. Much of the data is self-collected by the Port, including soundings of harbor floor, parcel boundaries for lease contracts, environmental data and radar data. Other data is derived from outside sources, including a high detail general Netherlands basemap, cadastral, aerial photography (at seven cm resolution for the entire harbor area) and general topographic maps.

DATA MANAGEMENT AND DELIVERY CHALLENGES

The centralized information solution has been very successful. However, to maintain standards of performance and efficiency, PoR continues to investigate ways to improve the current system. Because geo-information became so easily accessible via the centralized solution, the demand grew tremendously. For Information Management, this was a trigger to begin using web services. “Web services are no longer deemed a specialized area of information,” said Mulder. “The end user’s ability to interact with geospatial web services has increased significantly over the years.”

Even though requested information continues to reside in dedicated systems across the organization, there is a significant demand for a more integrated view of this information. “Everybody needs access to these sources, which calls for a service oriented information architecture and policy,” adds Mulder.

PoR identified four ‘must have’ improvements to the existing solution:

1. Web services for connecting to HAMIS (Harbor Master Information System)
2. Multiple user interfaces for different applications
3. Ability to access externally hosted datasets in office applications (without the need for import)
4. More modular framework to carry out modifications to minimize expense and system downtime

ERDAS APOLLO SOLUTION

After assessing of the Port of Rotterdam’s requirements for updating their existing system, Imagem, the authorized ERDAS reseller in the Netherlands and Benelux, presented the ERDAS APOLLO solution to PoR. “The overall aim of this implementation is to provide a general geographic information architecture for all spatial assets and all other geographically-significant items at the PoR,” said Patrick de Groot, Sales Manager, Imagem.

PoR’s Spatial Information Management recognized the power of ERDAS APOLLO Essentials-SDI to fully meet PoR’s main requirements. ERDAS APOLLO Essentials-SDI SDI is an entry level APOLLO product for cataloging and delivering geospatial data over the web, via a user-friendly interface.

Available in three tiers, ERDAS APOLLO is an enterprise-class data management system

enabling an organization to describe, catalog, search, discover and securely disseminate massive volumes of data. ERDAS APOLLO seamlessly integrates with existing GIS environments, leveraging business systems and supporting almost any kind of data input.

Mulder was impressed with the breadth of ERDAS APOLLO as a spatial information management system that implements an out-of-the-box service oriented architecture (SOA). “One of the strong elements of the ERDAS APOLLO framework is its ability to cover the whole stack of preparing data, creating web services and visualizing those in a client,” said Mulder, “without extra effort to integrate those stages; it’s all in the package.”

ERDAS APOLLO was also chosen for its adherence to OGC standards, which makes it easy for PoR staff to access geospatial web services into a variety of office applications. “These include applications for maintenance of infrastructure, the leasing of land parcels and nautical applications, to name a few,” said Mulder.

PoR also intends to use the ERDAS APOLLO Solution Toolkit to build custom client front-ends for their various customers. This includes adding OGC services discovery and visualization in custom GIS applications. “Contrary to our present client-server architecture, ERDAS APOLLO makes it possible to use different viewers and update tools for each of the user groups,” said Mulder. Plus the modular framework of ERDAS APOLLO enables modifications to be carried out with minimal, if any, system downtime. “The front end and back end connections are very flexible,” adds de Groot. “If they change something on the back end, it does not mean they have to also change the front end immediately, because of the service oriented architecture.”



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Albert Mulder, Spatial Information Manager
at Port of Rotterdam

Part of the ERDAS APOLLO implementation is in the back-end infrastructure, not directly visible to the end users. From an architecture standpoint, ERDAS APOLLO is situated between the database and the end-user application, and provides a healthy portion of the services delivered to that front end. ERDAS APOLLO also connects to other enterprise systems at the port, including Oracle, SAP, Microsoft SharePoint, Harbor Master Information System (HAMIS), several management systems (also partly in SAP), environmental systems and soil information systems.

ERDAS APOLLO Essentials-SDI has already been implemented in the following systems:

1. Ruimtelijke Informatie Voorziening (RIV): Translated to English this simply means “Spatial Information Management.” This is the general, organization-wide geographic information infrastructure. It can be accessed by the Port’s employees for a variety of processes and applications, including the database of lease contracts on parcels.

These are stored in SAP, which is connected to the geometric parcel database inside Oracle, which is now served through ERDAS APOLLO.

2. Harbor Master Information System (HAMIS): This system contains all relevant information for the Harbor Master, including tracking of ship movements, ensuring ship traffic safety, and handling ship traffic messaging. This is a live map of the Port and all current ship positions, which is constantly updated and projected on a large video-screen in the Harbor Coordination Centre.

Looking towards the future, Mulder adds, “there is no doubt that this implementation will yield benefits to the every day operation at the Port of Rotterdam, both in terms of insight and of speed of delivery, which will become more apparent over the next months as things develop.”

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Intergraph operates through two divisions: Process, Power, & Marine (PP&M) and Security, Government, & Infrastructure (SG&I). Intergraph PP&M provides enterprise engineering software for the design,

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