

# A holistic voyage management approach



Standardised voyage updates with SCEDAS<sup>®</sup> voyage management optimise administration and communication for all internal and external stakeholders Source: Fraunhofer CML

**VOYAGE PLANNING** The term ‘voyage planning’ is often used for the navigational route planning of a ship from berth to berth. However, a holistic voyage plan also comprises aspects such as the port rotation, cargo plans, bunker schedule, crew changes and maintenance plans. Coordinating those interdependent schedules is a complex communication task. Even though many tools offer decision support for voyage planning in terms of navigation route planning, few systems address the holistic voyage management. This is the starting point for the approach of SCEDAS<sup>®</sup> voyage management, as described by Anisa Rizvanolli, Celien Bosma and Ole John from the Hamburg-based Fraunhofer Center for Maritime Logistics and Services (CML).

Many processes revolve around a ship’s voyage. As soon as an operation affects the voyage plan, all other processes have to be adjusted. Cargo is likely to have the most impact on the voyage plan since cargo demand strongly determines port rotation and berthing times. Other operations must fit into that schedule.

Furthermore, passage planning influences the voyage plan.

In addition to avoiding bad weather conditions, weather routing is a strategy to identify routes with minimal impact on ship operation, including speed and fuel consumption. This can influence arrival times, port rotation and bunkering plans. If bunkering times are rescheduled or shifted to another port, the voyage plan has to be updated.

Moreover, congestion in the navigation area or pilot

delays can affect arrival times, which can lead to a change in port slots and berth availability. Another important component of voyage planning is crew management. The long-term crew schedule determines crew changes during the voyage. If the voyage plan changes, crew changes may have to be rescheduled. Lastly, the maintenance plan has to be coordinated around the voyage. The procurement of spare parts and

the schedule for external maintenance services depend on the voyage.

## Complex communication task

Considering all these different aspects, good voyage planning is a complex task both strategically and operationally. It requires close collaboration between different stakeholders. The parties involved in voyage planning can be different

departments within the same shipping company as well as different companies that share the ship as a common resource.

A typical example of the latter is the relationship between a charterer and a shipowner. The charterer may require short-term changes to the planned voyage, or updates on cargo handling and port calls. The shipowner has to react quickly to these requirements by reorganising the ship's scheduling.

The challenge is to organise the voyage related information from the owner, charterer or other participants as efficiently as possible while simultaneously taking different data formats into account. With increased connectivity, more voyage information is being exchanged digitally. However, different departments such as technical, cargo and manning, often act independently and send direct updates to the ship.

As a result, communications fall into separate information threads, with different data structures. As a result, information from different sources can only be processed manually, which is prone to error and misunderstandings. Segmented information leads to a communication overhead that could easily be reduced by adopting a common information and data model to represent all aspect of a voyage in a standardised way.

### SCEDAS® voyage management

The key tools to master the complex communication task of holistic voyage planning are standards, well-defined data formats, and a lean process. This forms the basis of the SCEDAS voyage management system. The planning tool makes it easy to coordinate the port rotation with all interdependent operations, such

as cargo operations, passage planning, bunkering, crew changes and maintenance. The tool serves as a central location for voyage updates for every involved party.

Changes in the port order, updates of arrival and departure times as well as changes to scheduled operations are managed in SCEDAS voyage management. Both the ship and the departments of the shipping company, therefore, have a holistic view of the entire voyage at a glance. The tool can easily be incorporated into existing systems.

Meanwhile, the change tracking tool provides a standardised documentation of all voyage updates. This enables a complete retracing of the overall voyage development process. Moreover, SCEDAS voyage management enables the documentation of the ship's de facto voyage and can serve as a digital logbook.

### Benefits of standardised voyage management

With the central planning tool, exchanging excel sheets and transferring between different formats is replaced by an efficient shared information platform. This streamlines the overall communication and administration processes that usually occur due to voyage updates. The structured data enables evaluation and analysis for valuable insights.

In addition, detailed documentation of voyage changes increases transparency for the company and can show optimisation potential. Standardised voyage management also provides efficient measures for fleet operation centres. With the documentation of a vessel's voyages in a common information format, its conditions can be quantified and benchmarked – in terms of major maintenance or bunkering operations, for example.

## Research institutes to collaborate on Industry 4.0 shipping impact

**INNOVATION ECOSYSTEM** | Norway's Sintef Ocean, one of Europe's largest independent research institutes, and Singapore's Technology Centre for Offshore and Marine (TCOM) are to take their June 2019 Memorandum of Understanding to the next stage. With inputs from Singapore's Maritime and Port Authority, the Singapore Maritime Institute and the Research Council of Norway, the two research establishments plan to collaborate on assessing the impact of Industry 4.0 on smart ships and ports, digital data exchanges, automated processes, autonomous ships, and advanced robotics. "Smart ships provide the platform for a myriad of technolo-

gies to integrate and make our current transport systems more intelligent," the research bodies said in a statement, providing an opportunity "to re-imagine and re-invent our transport systems". Both are necessary, they stressed, as steps toward a future sustainable world transport system.

While smart and autonomous vessels will be a step change for shipping, their adoption will require international standards and agreements, said Sintef Ocean's senior scientist, Ørnulf Rødseth, who is also secretary of the International Network for Autonomous Ships.

The organisation's president, Dr Vegar Johansen, emphasised the important of collaboration.



The roadmap investigates the impacts of Industry 4.0 in the shipping sector in terms of smarter ships and ports, digital data exchanges, automated processes, autonomous ships, and advanced robotics

"International collaboration is essential to further develop, and to successfully implement, smart and autonomous sys-

tems, and we are pleased to establish a committed collaboration with TCOM in Singapore in this area," he said.