

Coordinated Value Creation in Cruise Call Operations – The case of the Port of Stavanger

by

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Introduction – the passenger experience

Have you ever been frustrated by a delayed or cancelled flight causing you to re-arrange your business or vacation trip? Did you then feel that the transportation service providers did not really understand the purpose and needs for your trip?

Often, we view sea transport as purely the movement of goods. As in other transport industries, people can also be moved. The big difference between freight and passenger transport is that people sometimes seek both transport and experience. The voyage is part of the total passenger experience. Thus, the passenger experience should be the common object of interest for all involved actors. At the same time transportation between different locations need to be matched with the capabilities and possibilities of local infrastructure and facilities.

Within the maritime sector, the cruise industry has taken the passenger experience very seriously and cruise companies prepare their offerings years in advance. The industry is also the fastest-growing category in the leisure travel market. As the cruise product is diversified and aimed at different types of passengers, cruise lines aim to provide attractive offers to passengers based on the opportunities that each destination can provide. This also means that each port visit needs to be optimized to meet, or even exceed, the expectations of the passenger. The cruise line needs to manage expectations of the experience on-board and at the different cruise destinations that comprise a cruise package. This is of highest importance as a subpar customer experience will result in lost clients and revenue.

The logic of a cruise call – an effort of detailed pre-planning

Seen from a port's point of view, a cruise (port) call is initiated two to three years in advance to settle everything that is related to the port visit. This plan is then used for the



terminal to assign different locations within the port to enable possible parallel cruise calls at the same time. In a popular cruise destination, there is a desire to manage as many cruise calls as possible during the season. A challenge, however, is coordinating a number of calls on the same day. Any deviations of a cruise ship's ETA and ETD for the day of arrival will influence excursion options.

As the cruise season nears, contracts related to passenger excursions, linesmen, security and third party service providers are settled and then planned precisely by the port, agent, and cruise line. The cruise lines do not want anything to go wrong and thereby fail to meet the expectations of the passengers. Cruise excursions, for example, require a high level of coordination and understanding of the current situation to function well. This enables the cruise guests to schedule their excursions down to the smallest detail.

Even though actors have an individual focus on delivering their services, there is a need for joint delivery from all actors for a successful cruise call. In order to provide a high-quality joint delivery, actors must know and understand all involved parties' plans and outcomes and their role in making a cruise call a success for each passenger.

Disruptions can happen, such as a tour operator missing a ferry causing a delay for passengers returning to their cruise ship. In most cases, when tours are delayed then the departure of a cruise ship is delayed, which can also have consequences for other ships in the area, including other cruise ships. There might be several cruise ships arriving on the same day having the same types of needs of services, physical infrastructure, and sea passages. Unplanned changes can cause serious delays, bottlenecks, or cancellations, which requires re-planning and execution. In the worst case, the passenger experience is inferior or non-existent.

The PortCDM approach to coordinated operations and digital collaboration

As part of the Sea Traffic Management Validation Project (STM), Port Collaborative Decision Making (PortCDM) enables enhanced coordination among involved stakeholders in the port and in relation to approaching and departing ships. Four collaboration arenas define the scope of PortCDM: within ports, between ports, between ships and ports, and between ports and hinterland operators. In the case of cruise operations, the activities pursued by passengers are treated as hinterland operations. The type of stakeholders involved range from the cruise line and the ship to terminal operators, security, and tour operators (see figure 1).

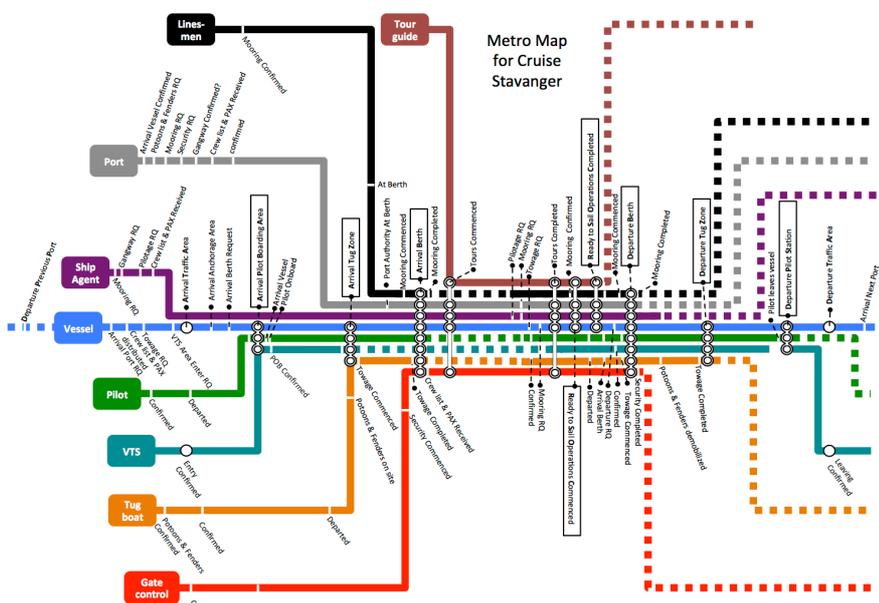


Figure 1: Actors and events associated with cruise line calls

Within PortCDM, operational and technical procedures define how actors within the port and towards the surroundings should be arranged.¹ At the core of the PortCDM concept is establishment of digital trust among the involved stakeholders through physical collaboration. In the efforts pursued for validating PortCDM, a Living Lab

approach² is adopted bringing involved actors to the same table for discussing collaborative issues. This arena of physical collaboration supports actors to identify what data are necessary to share for enhanced coordination. In this way a common understanding can be established for why there is also a need to share data with others.

Some reasons for sharing data digitally include:

- establishment of situational awareness, which allows for good internal planning and resource utilization
- enablement of the necessary arrangements and re-arrangements in due time to support a cruise ship call
- identification of core states that all actors must coordinate around for an optimal call
- provision of estimates and actuals, with minimal or no use of telephone, email, or person-to-person communication
- establishment of systems of records to be used for the involved actors to synchronize their operations

¹ Lind M., Bergmann M., Watson R. T., Haraldson S., Park J., Christensen T. (2018) From Concept to Implementation – an interplay between practice and research, Concept note #7, STM Validation Project

² Haraldson S., Karlsson M., Lind M. (2016) The PortCDM Living Lab Handbook, Revision 1.0, MONALISA 2.0

The case of Stavanger – enhanced coordination of cruise calls

Stavanger is an attractive destination for cruise visits during May to September. Over the years, the port has continually been required by cruise lines to deliver high quality services for cruise calls. In the figure 2 below, the number of cruise calls and the volume

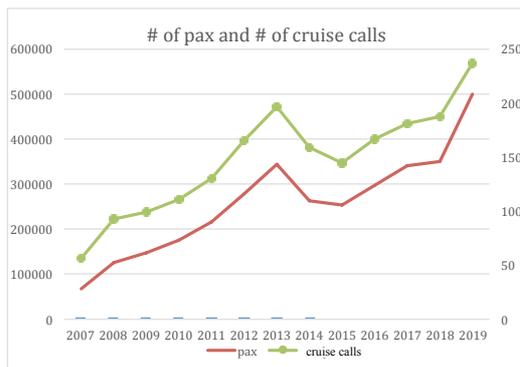


Figure 2: Developments of the number of cruise calls and amount of passengers 2007-2019

of passengers for the period of 2007 until 2019 (planned) visiting Stavanger is depicted.

The biggest challenges for the Port of Stavanger are the number of actors involved and the high degree of coordination needed. For this purpose, PortCDM was introduced at the end of 2015. At that time, a number of issues were

identified as obstacles for coordination of a port call, and these related to creating situational awareness, such as:

- No common real-time understanding of the situation throughout the value chain.
- No tools or alarms to notify relevant stakeholders of disruptions.
- Lack of information from external actors to create sufficient situational awareness.

A series of Living Lab meetings were held to derive the requirements on collaboration and data sharing, and the following procedures were followed:

- reconstruction of earlier cruise calls stretching back two years to reveal the communication conducted between port call actors to identify patterns of interaction and collaboration (as-is)
- streamlining the process of long- and short-term planning as well as principles of data sharing prior to, during, and after a port call (to-be) by questioning the existing practice to avoid the digitization of bad processes and habits.

The process started by inviting the main actors involved in a cruise call to Stavanger to the first Living Lab meeting, which was held on the 2nd February 2016, when 17 persons from 9 different organizations with different tasks participated. A project plan was established to clarify what to do, identifying systems for building machine-to-machine (M2M) connectors, and all actors were asked to note down all data exchange for the forthcoming cruise calls (what data, communication method, with whom and when) for the next Living Lab meeting. During the second Living Lab meeting, on the 4th March 2016

demonstrator at Port of Stavanger was launched on the 15th August 2016 onboard HMS Britannia. The Norwegian Minister of Transport Ketil Solvik-Olsen logged into PortCDM and officially inaugurated the Port of Stavanger test bed. The event onboard HMS Britannia was followed by an exhibition and panel debates in the Concert Hall of Stavanger. During this event, a security official explained that other cruise ships in the port would be delayed by approximately 30 minutes. When asked how she knew this, she explained that she had just received a call from a tour guide informing her that a tour bus had missed a ferry. She did, however, not know with whom she should share her call.

Ships going in and out of Port of Stavanger need to pass through a channel where there are restrictions. No more than one ship longer than 120 meters can be in the channel at the same time. Coordinating when ships are allowed through the channel is done by the VTS, which provides slot times, and the port authority, which approves arrival and departure berth times based on channel availability. The delay caused by the tour operators missing the cruise ferry disrupted channel scheduling for all ships going in and out of the port.

In some case cruise ship is early to port area and everybody is now, empowered by the PortCDM demonstrator, notified immediately by statement sent from automatic connector to mobile devices such as phone or tablet. All necessary actors needed to dock this call then have the same information and opportunity to reorganize in order to serve the cruise ship in due time.

Since the introduction of PortCDM, Stavanger has participated in developing the concept and adapted it according to its needs. At regular occasions there has been Living Lab meetings conducted with the port stakeholders. Empowered by the PortCDM testbed (within the STM validation project), PortCDM enables and responds to the challenges observed in this collaborative setting (e.g., delayed services). By identifying a lack of initial situational awareness, the Living Lab meetings have reinforced the need of a real time data-sharing hub and for a port call message standard,³ supporting the stakeholders to enhance their coordination and mitigate operational uncertainties by having more and better data.

The actors have also seen new opportunities for improving cruise call practices since the introduction of PortCDM. Stakeholders now receive and give data using the PortCDM message format and new reporting tools (e.g. machine-to-machine integration), enabling

³ As of the spring of 2018, the port call message format, coming from the results of the STM validation project, has been handed in as a S-211 standard as to be endorsed by IALA.

better situational awareness and Just-In-Time (JIT) operations. Those who can deliver JIT operations save time and money and gain an edge over competitors by delivering services at the right place, at the right time⁴.

“For a single actor, such as mooring services, savings by better sharing of intentions and events could be hundreds of thousands of NOK a year. This will give actors the opportunity to utilize internal resources more efficiently”,
Martin Rikstad, CO, ReXoR Marine AS

To summarize, coordination of cruise ship operations has become better in Stavanger by the support of PortCDM due to:

- actors meet and elaborate on essential data sharing for coordination on a regular basis
- data about plans and changes are shared real-time during operations, e.g delays such as the one with tour busses missing the ferry can now be communicated via mobile devices connected to the PortCDM demonstrator enabling that information is shared to all involved parties in real-time.

In the future, the Port of Stavanger sees a need for continuous improvement efforts, utilizing what is revealed in PortCDM as a system of record, of the port's operational performance.⁵ The principles of Total Quality Management and Lean operations as used in the process industry could be one source for systematic analysis to spur continuous improvement. The goal is to enhance the value of the services delivered to customer by ships (cruise and others), ports and third party service suppliers in both local and international forums. By real-time monitoring of ship arrivals and departures and by introducing alarms and control limits on other service providers (i.e. utilizing the notification and indication principles of PortCDM⁴), disruptions may quickly be registered and actions can be taken to mitigate or remove the unwanted effects in real-time, something that has not been possible until now. For instance if we look back at the example of the where only one only one vessel exceeding more than 120 meters is allowed to pass through the channel, the port call message standard developed within the project can now be used to develop services that can inform relevant actors when a delay occur on an arrival or departure that will disrupt other traffic passing through the channel or when the channel is occupied by a large vessel.

⁴ Lind M., Rygh T., Bergmann M., Watson R.T., Haraldson S., Andersen T. (2018) Balancing just-in-time operations – coordinating value creation, Concept note #6, STM Validation Project

⁵ Lind M., Bergmann M., Haraldson S., Watson R.T., Park J., Gimenez J., Andersen T. (2018) The Skilled Collaborators – the winners in the a digitized maritime sector, Concept note #2, STM Validation Project

Final words

In Norway, the major cruise ports joined together to prepare an EPI (Environmental Port Index), whereby cruise ships must document sea and air emissions, waste management and energy use when berthed. This index might determine a port's fee. Any unnecessary start-up of machinery before necessary due to delays will increase cruise ships cost according to EPI. To generate reports and basis for analysis, this is a call for enhanced sharing of data related to environmental concerns for reduced environmental footprints.

Cruise call are realized through multi-organizational business processes⁶. In such processes passenger processes must be seen as the common object of interest among involved actors to ensure ultimate passenger experience. Passengers conceive their overall experiences based on the sum of all experiences perceived where nothing is better than the weakest link. This means that integrated performance for different passenger needs becomes the driving factor. Passenger experience is most differently from cargo handling. In Port of Stavanger, some first has been taken, empowered by PortCDM, to manage the integration of different actors' operations for a good overall experience during cruise calls in Stavanger. As the next step, Port of Stavanger hope for deriving even richer situational awareness by enhanced port-to-port communication between cruise ports that the cruise ships visits in their port rotation schema.

Some ports, such as Stavanger, serve two types of economies, the production economy that delivers goods to consumers, and the service economy that provides customers an experience, such as a cruise. In the latter economy, experience-oriented customers expect process completeness,⁷ which means the cruise line providing customers with a seamless, comprehensive service across multiple service providers. For the cruise customer, process completeness means that every aspect of the cruise (onboard, in port, and on land) contributes to their experience, and the shortcomings of any process, such as a poor tour guide or later mooring, can diminish their experience. This requires tight coordination between all contributors and timely service delivery to ensure a complete and high-quality experience. Timely port operations are pivotal to process completeness

⁶ Haraldson S., Lind M. (2011) Value Chains in Value Networks: A Multi-Organizational Business Process Definition, Australian Conference on Information Systems, Australia;

Haraldson S., Lind M. (2011) Dividing Multi-Organizational Businesses into Processes: Capturing Value Creation in Assignment Structures, Australian Conference on Information Systems, Australia

⁷ Piccoli, Brohman, Watson, & Parasuraman. (2009). Process completeness: Strategies for aligning service systems with customers' service needs. *Business Horizons*, 52(July-August), 367-376.



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because the berthing of a ship sets in action a series of tightly coupled processes, such as tours to nearby tourist sites, that cannot commence until a ship ties up. When a customer buys an experience they want to be delighted, not delayed.

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