

## Port Simulator

Developed as a graphical web application, the Port Simulator is a tool that presents all port activities in a certain point of time. The main view of the Port Simulator is the port map showing dynamic and interactive objects at different locations; vessels berthing, cargo in yards, pollutions marked as circular areas. All this data is retrieved dynamically from the database, even the map is loaded dynamically from XML file generated from AutoCAD drawing. The system is event based; all activities are related to time and user can navigate through time to show the port state at any time point. It shows activities from past, present moment and can plan for the future.

### Vessel Operations

**Actual vessel movement:** User can load vessel operations in certain period and navigate in time using the timeline to view vessel locations and states at different points of time.

**Berth planning:** Vessel optimized berth planning depends on berths and vessels data from database. The algorithm is optimized for each vessel and considers different criteria as cargo commodities, berth depths, vessel drafts, expected arrival time and yards locations. Each berth has a score for carrying different types of cargo and ships. According to these scores as well as vessels priorities and other restrictions and considerations, berth plan is generated.

**Berth plan editing:** After automatic generation of the berth plan, the user can edit the plan flexibly by dragging vessels from berth to another at the required distance. The user can override auto-generated plans according to special cases that may arise.

**Plan saving and loading:** Berth plans can be saved and loaded for editing and publishing.

### Cargo Operations

**Tracing cargo of a shipping agent or vessel:** Cargo of a certain agent company or a specific vessel can be traced to view its location in yards.

**Querying cargo in yards:** On clicking on a yard, a list of cargo items is viewed in the cargo control panel.

**Calculating yard occupations:** Users are able to calculate the occupation percentage of yards to decide where to put the incoming cargo.

**Planning cargo storage:** Planning exported and imported cargo storage locations before vessel arrival. Plans include moving cargo from yard to another.

**Pollutions and Causalities Operations:** Pollution active areas and causalities in a certain period are shown as circular areas. The circle's color depends on the pollution type and can be changed using a color palette.

**Tracing affected objects:** Harmed objects including yards, buildings, and vessels.