



A holistic  
passenger  
ship  
evacuation  
and rescue  
ecosystem

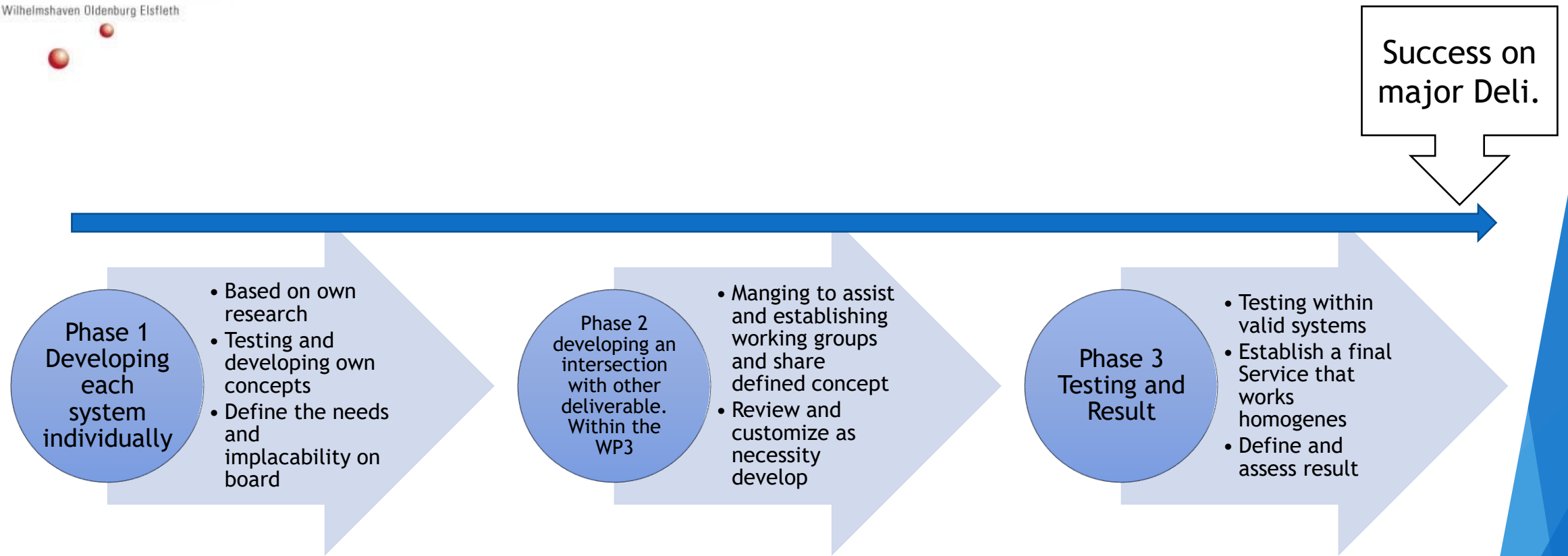
# PALAEMON Intelligence Framework AI-Services and Algorithms WP3 - Final Review 23.03.2023

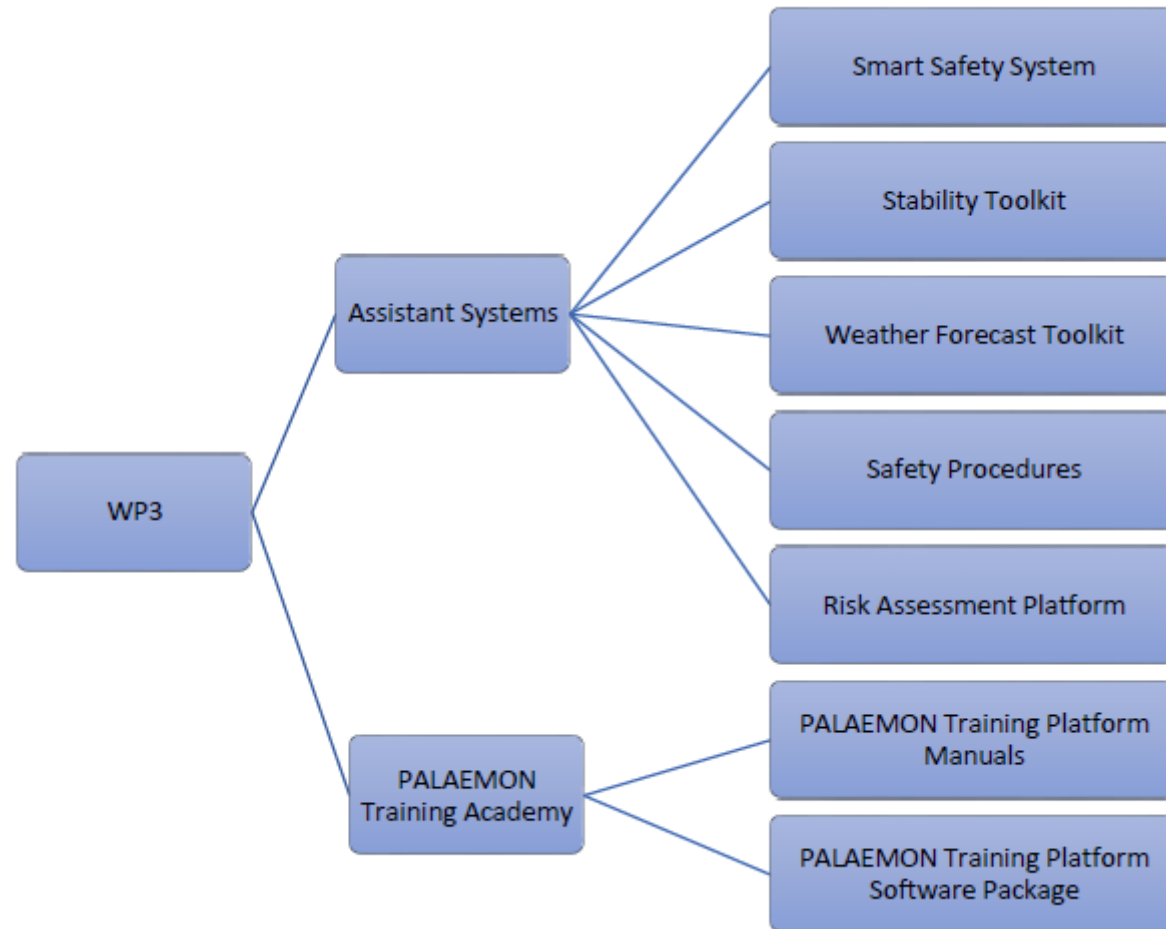
Final Review and Report for WP3 Deliverable and tasks



## Overview of Deliverable and their assigned partner:

Task #	Titel	Responsible Partner
Task 3.1	Evacuation Methodologie & Models Analysis	JU
Task 3.2	Ship Stability Toolkit	JU
Task 3.3	Weather Forecasting Toolkit	KT
Task 3.4	Safety Procedures	DANAOS
Task 3.5	Risk Assessment Platform Development	NTUA
Task 3.6	PALAEMON Academy	SIMAVI





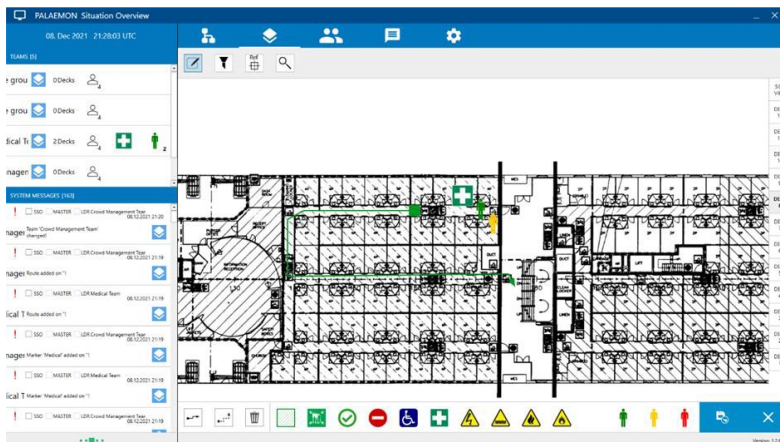
Task 3.1	Evacuation Methodologie & Models Analysis (V1, V2) Smart Safety System	JU
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SSS is designed to improve communication and safety during evacuation, keeping functions simple and easy to understand.

The module provides an overview of the evacuation status and provides an interface for the connection between the Master and the evacuation team.

The system developed within this work package was designed to support the crew and Management Rank in taking decisions and managing the process of evacuation based on various inputs from other systems. The major obstacle for the project was implementing the systems within real scenario to exploit the usage scope and define modifications and alteration. JU was able to confirm two major out comes for the SSS Usage: internal users (Nautical Students and planned scenario) and cooperation with ATOS and other Partners. Testing the process of the date between various systems developed within PALAEMON Project was also done.



# Smart Safety System

Task 3.2	Development of Ship Stability Toolkit (V1, V2)	JU
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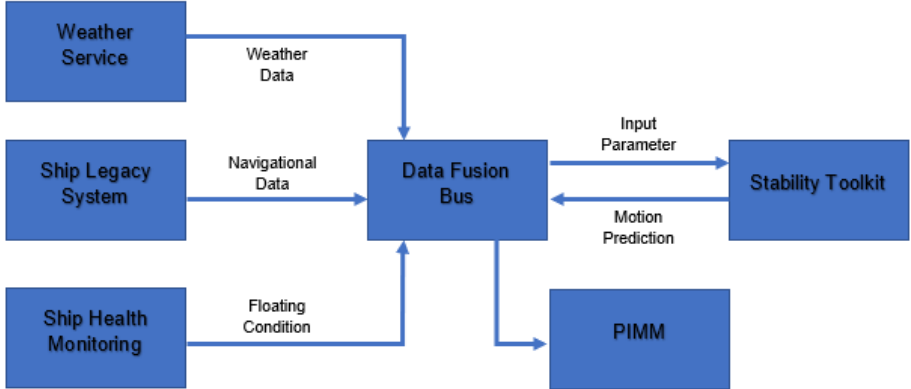


The Ship Stability Toolkit (SST) is a motion prediction system to assist the Master and Bridge Command Team during an incident with ship motion predictions. It is important for the evacuation process as the survival crafts on board might be limited in their ability to board and launch, while the vessels movement exceed certain limits. The predictions will be delivered to the PALAEMON Incident Management System according to the ships actual navigational, stability and weather data.

The Stability Toolkit listens to the Data Fusion Bus for input data and calculates the maximum motions of the vessel, which are displayed in the PIMM dashboard.

The Ship Stability Toolkit outputs data to the Decision Support Centre on the PALAEMON Incident Management Module to provide an overview of the incident.

The Ship Stability Toolkit is designed to assist a safe evacuation by making predictions of maximum motions based on stability data, navigational data and weather information.



# Stability Toolkit

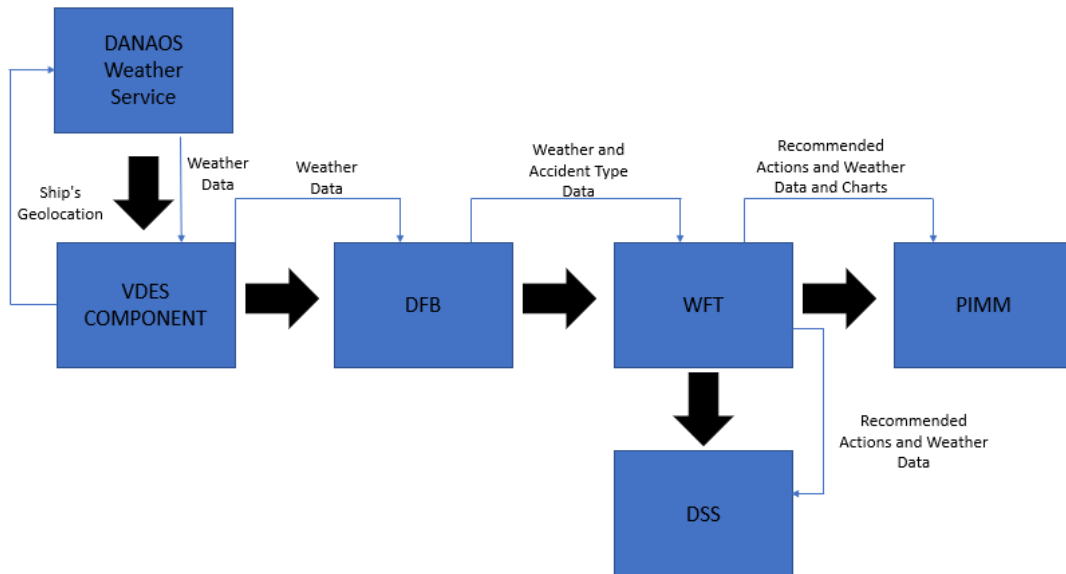
Task 3.3	Development of PALAEMON weather forecast tool (V1, V2)	KT
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Weather Forecasting toolkit is related to WP3, WP6, and WP7, and is used to produce output for components such as the Data Fusion Middleware, On-Board Decision Support System, Incident Management Module, and VDES Deployment.



The Weather Forecast Toolkit identifies appropriate actions and identifies potential risks for human life, raising awareness of decision-makers.

The WFT provides weather conditions at the incident time, wind speed, wind direction, Wind Waves significant wave height (SWH), and visibility conditions. It aggregates all incidents at the dataset based on the wind speed and visibility conditions, and provides charts that show the expected percentages of injuries and deaths for each incident



# Weather Forecast tool

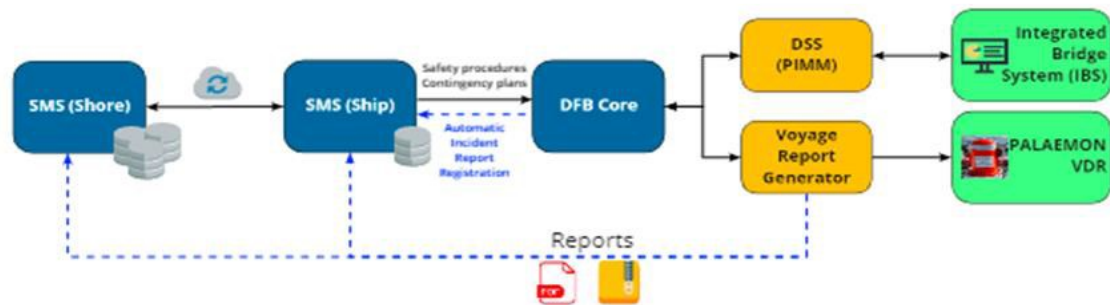
Task 3.4	Modelling of Safety procedures (V1, V2)	DANAOS
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PALAEMON SMS tool is a Safety Management System (SMS) administrator tool developed to automate the documentation of safety procedures with minimal human intervention. It is a component of the integrated PALAEMON system.

SMS Tool consists of three main components: SMS ashore, SMS on-board, and SMS synchro engine. It is integrated with the PALAEMON ecosystem and spans across all phases of the incident management and evacuation process.

PALAEMON SMS tool provides safety information, digitalize procedures, bridge connectivity between office ashore and vessel, and hold triggers for updates and control changes following post-incident investigation. This functionality is semi-automated enabling an interface with incident related data captured on-board and recorded in PALAEMON Voyage Report Generator (VRG).



# Safety Procedures



Task 3.5	Development of Risk Assessment Platform (V1, V2)	NTUA
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National Technical University of Athens

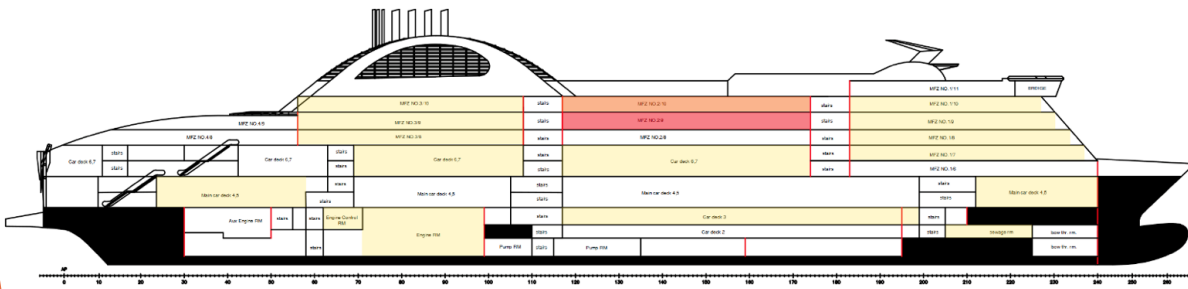
**Risk Assessment Platform (RAP):**

- Performs a dynamic risk assessment in real-time, by utilising Bayesian Networks (BNs)
- Enhances the situational awareness of the Master and Bridge Command Team during the evacuation process
- Provides information for decision support on the incident/accident management lifecycle

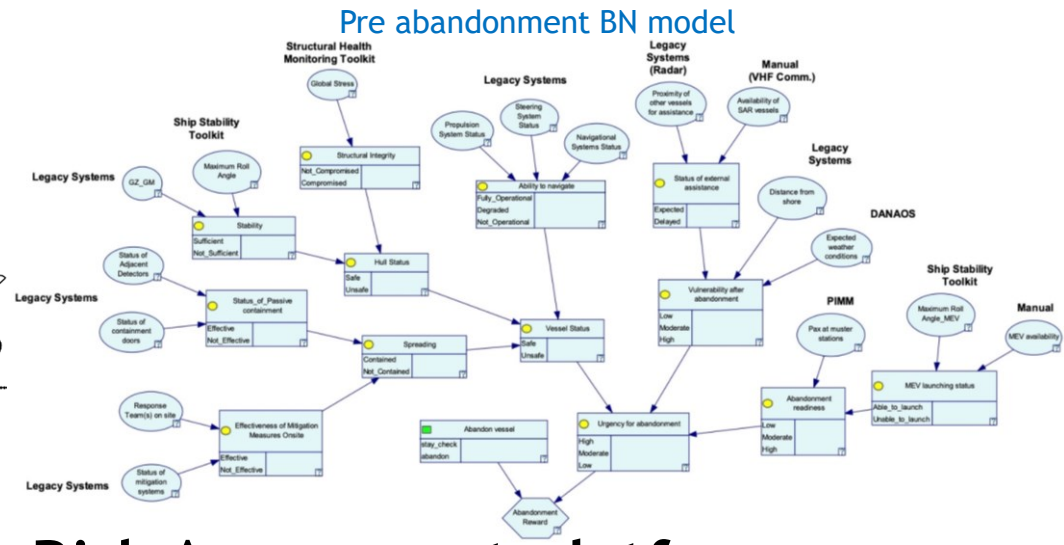
**3 Model System:**

1. Situation Assessment: It assists the Master to take the decision whether to raise the GA or not.
2. Mustering Effectiveness: It quantifies the mustering effectiveness by providing the risk of delay level as a colour coded outcome, per deck and Main Vertical Zone (MVZ).
3. Pre-Abandonment: It assists the Master to take the decision whether to give the abandonment order or not.

Visualisation of indicative output of the Mustering Effectiveness model



Risk of delay	Colour code
High	Red
Moderate	Orange
Low	Yellow



**Risk Assessment platform**

Task 3.6	PALAEMON Training Platform Software Package (V1, V2) PALAEMON Training Platform Manuals (V1, V2)	SIMAVI
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## PALAEMON Academy



Provides the software needed by trainers to simulate the scenarios developed in WP2.

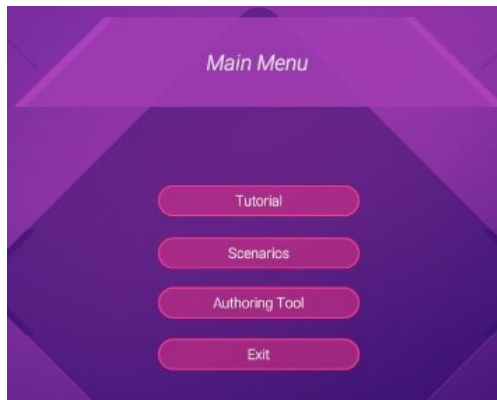
The software includes:

- A training simulator. Allows WP2 scenarios to be simulated in a Virtual environment
- An authoring tool. Provides the tools for updating the existing scenarios or to create new ones.

The authoring tool includes a library of 3D resources, interactions, avatars, dialogues, multimedia resources to allow the use of optimized resources in 3D and VR simulations.

The tool is closely connected to WP6.4 since it allows the intervention team to familiarize with the interface prior to using the MR headsets.

PALAEMON Academy authoring tool is a training software package designed to enhance staff training and awareness by facilitating knowledge transfer and providing best practices. The deliverable provides an overview of the evacuation status and the connection between the Master and the evacuation team.



Main menu



Example of Scenario, widgets on the left side



Authoring Tool, list of available resources



A holistic  
passenger  
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# Thank you

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