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STEAM

Sea Traffic Management in the Eastern Mediterranean

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STEAM in numbers…

STEAM (Sea Traffic management in the EAstern Mediterranean)

- *Project number:* **INTEGRATED/0916/0063**
- *Start date:* January 2nd, 2019
- *Duration:* 3 years
- *Funding amount:* 1 million EUR
- *Funded by:* the European Regional Development Fund and the Republic of Cyprus through the Research Promotion Foundation

European Union
European Structural and Investment Funds

Republic of Cyprus

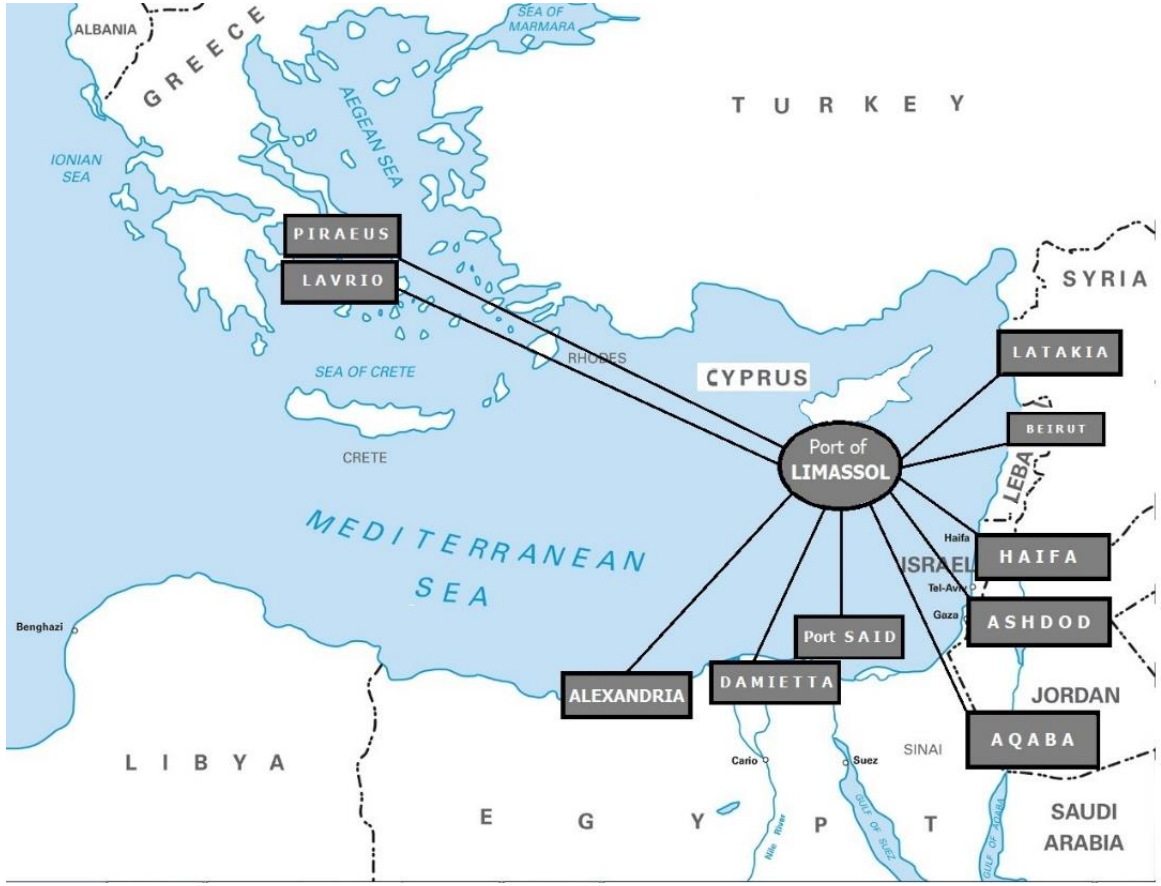
Structural Funds
of the European Union in Cyprus

2016-2020 RESTART SEARCH

Research Promotion Foundation

Why the STEAM project?

- To develop **Port of Limassol** to become:
  - a **world-class transhipment** and **information hub** adopting modern **digital** technologies brought to the maritime sector
  - a driver for **short sea shipping** in the **Eastern Mediterranean** through enhanced services based on standardized ship and port connectivity



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STEAM Objectives

The general objective of the STEAM project is the efficient management of sea traffic in the Eastern Mediterranean sea, while at the same time ensuring safety and environmental sustainability

1. Improve the efficiency of various port operations and services

2. Optimize sea traffic navigation and facilitate short sea shipping

3. Collect real-time information related to ship movements, the environment, and the tracking of cargo

4. Ensure high quality data, calculate KPIs, and create new decision-support tools and services

5. Develop effective links and synergies among all interested maritime stakeholders

STEAM Consortium

The STEAM interdisciplinary consortium consists of established stakeholders of the quadruple helix:

- research/academic institutions (CUT, RISE)
- public authorities (CPA)
- civil society organizations (CSA)
- private enterprises (CSCS, DELEVANT, TOTOTHEO)

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Αρχή Λιμένων Κύπρου

CYPRUSUBSEA
Consulting and Services C.S.C.S. Limited

TOTOTHEO MARITIME

RISE

Cyprus Shipping Association

delevant
forecast.plan.monitor

STEAM Associated Stakeholder Network (ASN)

The STEAM ASN consists of established stakeholders of the Cyprus maritime sector:

- DP WORLD Limassol – Cruise and General Cargo Terminal
- EUROGATE Container Terminal Limassol
- P&O Maritime – Services (pilots, tug-boats, linesmen)
- Cyprus Shipping Chamber (CSC)
- Maritime Institute of Eastern Mediterranean (MarInEM)

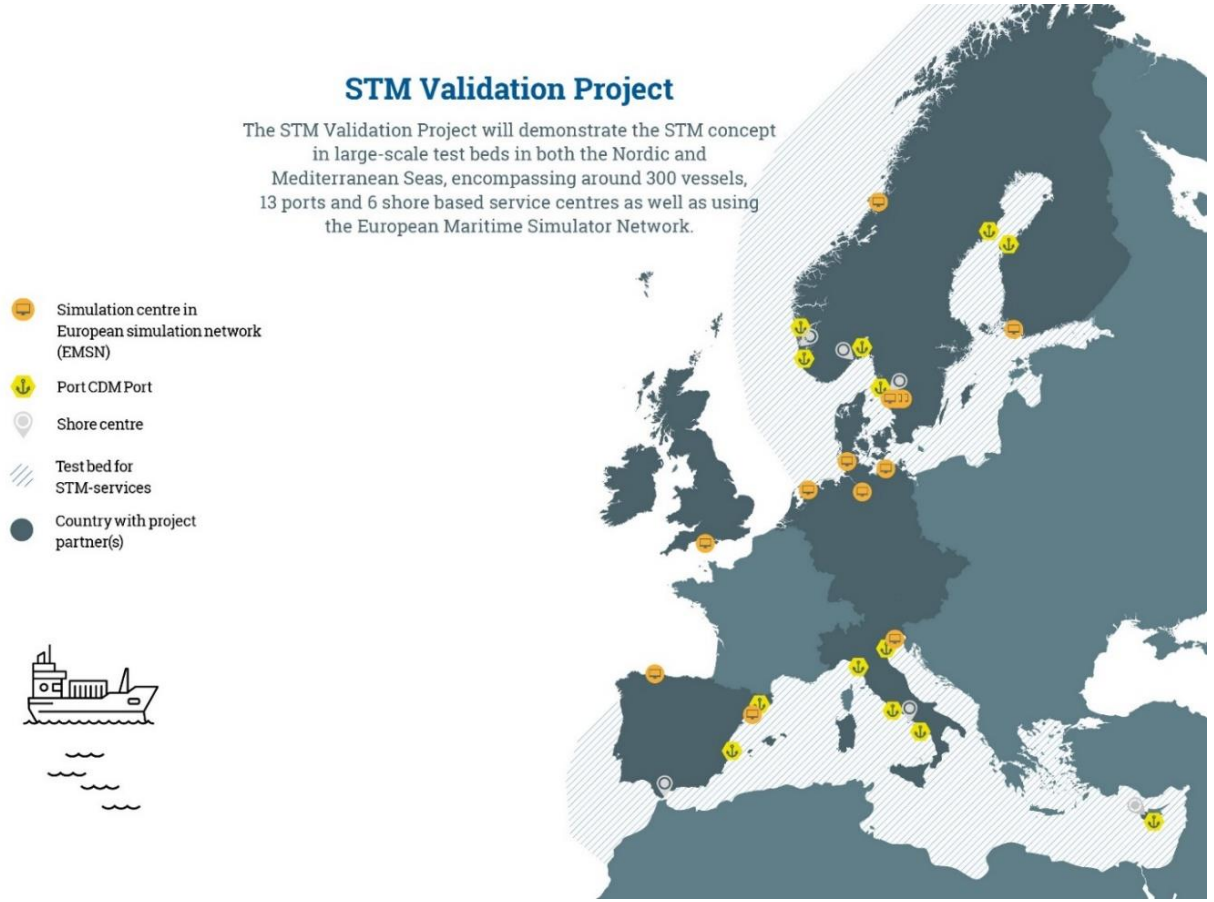
STEAM Advisory Group (AG)

The STEAM AG consists of established stakeholders of the international maritime sector:

- Trond Andersen, Marine Operational Advisor at NOFO (The Norwegian Clean Seas Association for Operating Companies)
- Michael Bergman, Executive Advisor - BM Bergmann-Marine
- Albert Gonzalez, Port of Barcelona, Spain
- José Andrés Giménez Maldonado, Valenciaport Foundation, Spain
- Anders Johannesson, Senior Adviser, VTS and Shore Centers, Swedish Maritime Administration
- Robert Ward, Independent Consultant, Hydrographic Advisor
- Gadi Benmoshe, Chief Information Officer at Israel Ports Development & Assets Company - IPC

Sea Traffic Management (STM) Validation Project

- STEAM project will be based on the foundations laid out by the EU **Sea Traffic Management (STM)** Validation Project
  - 43 million EUR
  - Over 50 partners
  - 2015-2018
- 9 ports of Europe, one of which is the Port of Limassol
- The **Port Collaborative Decision Making (PortCDM) platform** provides standardized exchange of real-time information between all related actors
- **Voyage Management Services** provide support to individual ships in both the planning process and during the voyage



STEAM Scientific and Technological Objectives

1. Extend the Port Collaborative Decision Making (PortCDM) platform

2. Establish the Limassol Shore Center (LSC)

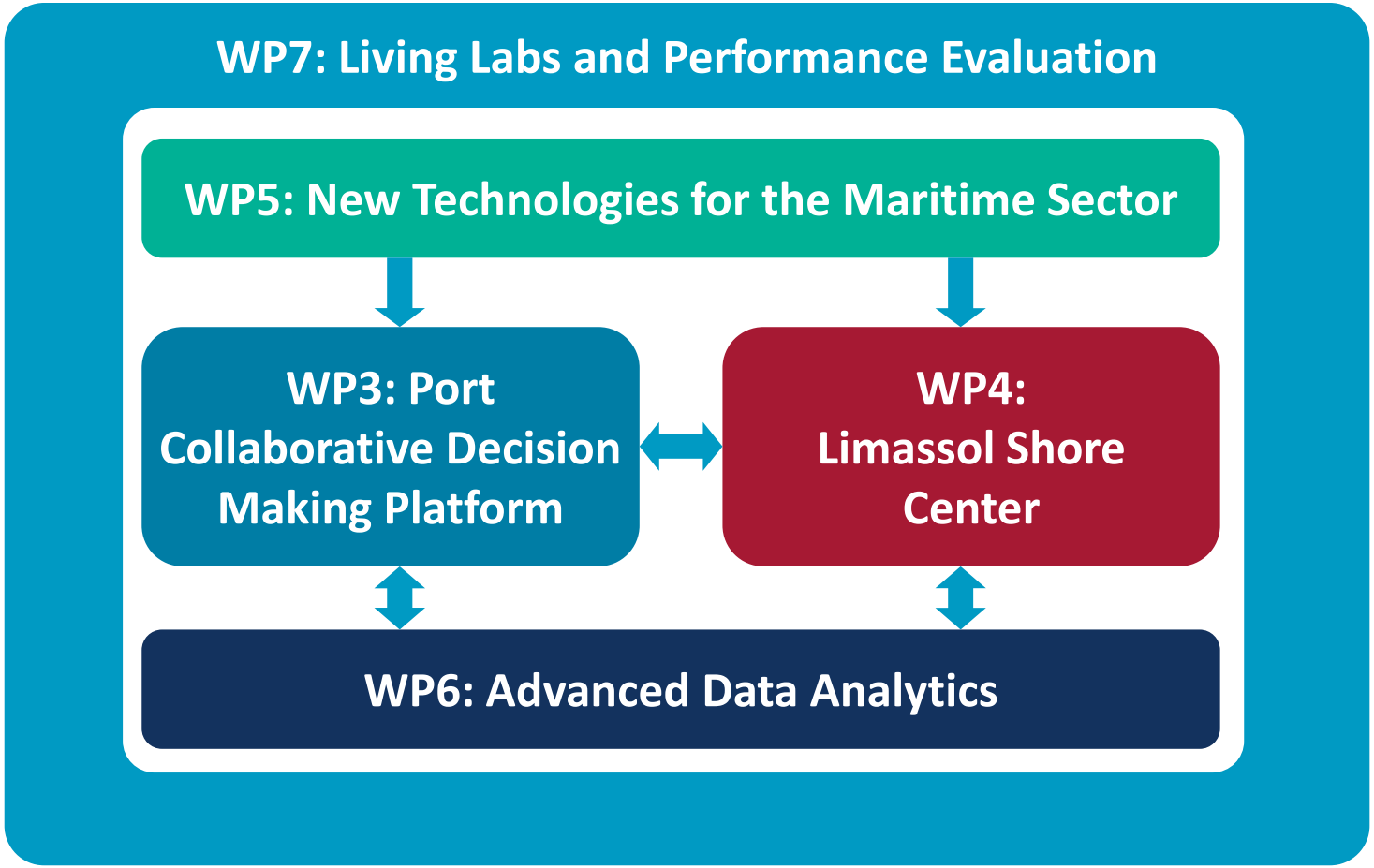
3. Incorporate innovative technological solutions into maritime operations

4. Provide advanced data analytics services to maritime stakeholders

5. Organize Living Labs with all relevant maritime stakeholders

The developed platform and solutions will be evaluated against measurable indices and KPIs concerning three primary areas: (i) **efficiency** (ii) **safety** (iii) **environmental sustainability**.

Implementation Plan

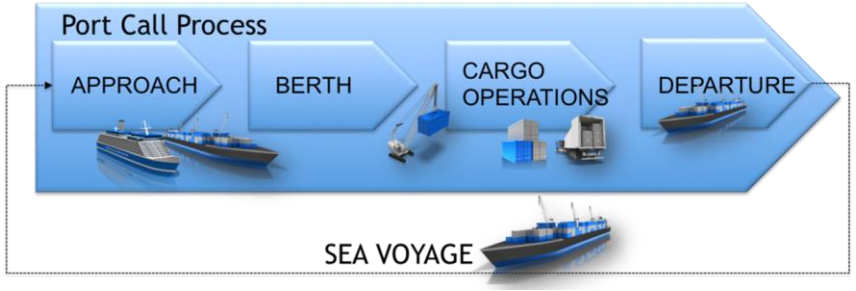


WP3 – Port Collaborative Decision Making Platform (CUT)

Aim: Enable real-time situation awareness to all participants involved in maritime activities in the ports of Cyprus for optimizing port call operations within a port, enabling collaborative decision making across ports, and offering port services to interested parties

T3.1: Optimization of port operations

- Identify the port call process
- Design customized web interfaces and mobile apps
- Connect stakeholder's systems to shared platform



T3.2: Port-to-port collaboration

- Extend/Customize PortCDM to support all Cyprus ports
- Develop new services for port-to-port collaboration

Project Innovation: Customize PortCDM to meet the specific requirements of the Cyprus ports and propose significant extensions for advanced real-time coordination among the involved partners as well as new port-to-port collaboration features

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WP4 – Limassol Shore Center (CUT)

Aim: Establish the Limassol Shore Center (LSC) to act as a communication hub in the Eastern Mediterranean region and to provide various services to ships in order to optimize sea traffic navigation, increase maritime safety in the region, and promote and facilitate Short Sea Shipping

T4.1: LSC setup and operation

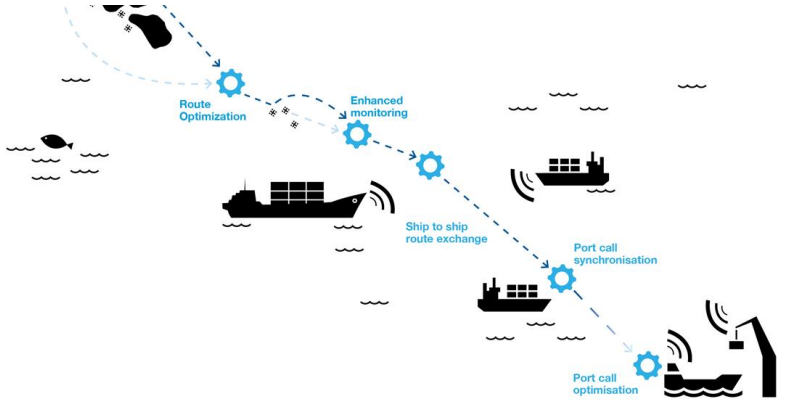
- Evolve as a part of the current Limassol VTS operations

T4.2: LSC services

- Route cross-check, flow-management, enhanced monitoring, search and rescue

T4.3: Short Sea Shipping

- Real-time coordination of large inbound vessels with smaller outbound ones
- Optimized services for unloading, deconsolidation, and reloading of goods for transport to their final destinations



Project Innovation: Establishing the Limassol Shore Center in order to implement and evaluate a set of core shore-to-vessel services. Offer new solutions and services for short sea shipping

WP5 – New Technologies for the Maritime Sector (TOTOTHEO)

Aim: Incorporate innovative technological solutions (e.g., AIS, buoys, UAVs) to the Maritime sector for providing real-time information related to ship movements, the environment, and the tracking of cargo

T5.1: AIS data collection and integration

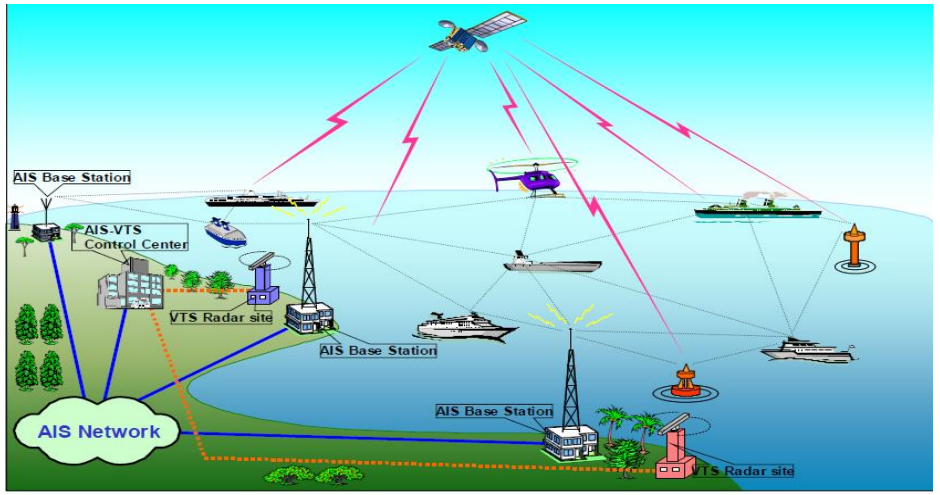
- Integrate AIS data from existing and new stations
- Collect AIS data from smaller vessels moving in the area

T5.2: Environmental monitoring data

- Collect and integrate environmental monitoring data from existing sources and new sensors on buoys/UAVs

T5.3: Real-time tracking of cargo

- Implement a system for real-time tracking of cargo in the port
- Interface with existing systems for extracting and investigate new technological solutions (e.g., RFID tags) as necessary.



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Project Innovation: Innovative technological solutions for providing real-time information and services related to ship movements, the environment and the tracking of cargo

Aim: To integrate and store all available (heterogeneous) data and to develop new methods, tools, and algorithms for implementing a variety of analytical techniques for extracting new meaningful insights

T6.1: Data integration and storage

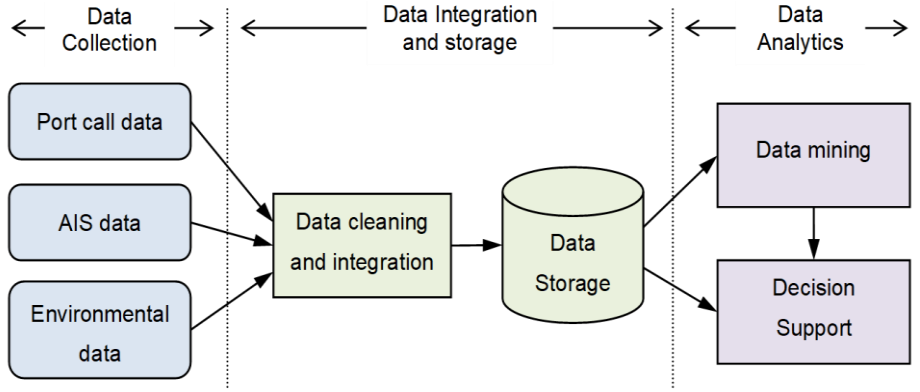
- Data cleaning and reconstruction of faulty/missing data
- Data integration techniques for fusing data together

T6.2: Data mining

- Algorithms for extracting useful information out of the data based on user requirements (e.g., KPIs, correlation)

T6.3: Decision support services

- Develop business-oriented services that support organizational decision-making activities (e.g., scheduling allocation of ships to port services, stowage planning)



Project Innovation: New state-of-the-art methods, tools, and algorithms for ensuring data quality and extracting meaningful insights. New business oriented services for decision making

WP7 – Living Labs and Performance Evaluation (CUT)

Aim: Actively and formally engage all relevant maritime stakeholders in both formulating the user requirements as well as evaluating the overall results and benefits of the project

T7.1: Set up the Living Labs

- Set-up Living Labs in terms of structure and scope
- Define scope, target groups, introduce actors, assign roles

T7.2: Run the Living Labs

- Run thematic Living labs with focus on key project requirements and outcomes

T7.3: Performance evaluation

- Collect insights, experiences, and findings throughout the project and evaluate the technological solutions

Project Innovation: Living Labs strengthen innovation capacity through cross-fertilization and open collaboration between the different actors, leading to the acquisition of new knowledge and skills for the project partners

Impact on Maritime Industry

- **Efficiency**: The proposed Port CDM platform will result in the **reduction** of **administrative burden** for the port authority personnel and in the **better utilization** of **port resources** such as anchorages, berths, pilots, tug boats
- **Safety**: The establishment of the LSC is expected to increase the safety of the vessel traffic as the vessels will be **aware** of the **traffic situation** ahead of them and unwanted situations such as **accidents** can be **prevented**
- **Environment**: Reducing the risk of accidents will be very beneficial in terms of environmental impact (e.g., reduce accidental spillages). The project also provides **real-time environmental pollution detection** and **monitoring** within the port authority's designated control area

Political, Social, and Economic Impacts

- Modernize the ports of Cyprus with **new technologies** and **maritime services**
- Upgrade the **Port of Limassol** to an **information hub**, exchanging information with both nearby ports and ships in the Eastern Mediterranean
- Establish the use of Cyprus ports as **transshipment hubs** for **short sea shipping** by improving their competitiveness in the area
- Increase the maritime traffic in the **Eastern Mediterranean** and especially through the **Cyprus ports**, thus stimulating economic growth of the maritime sector in Cyprus
- Improve the communication with other nearby countries and ports, thus reducing the cost of transporting Cypriot freight, resulting in positive effects on the Cypriot traders and consumers
- Enhance public engagement with marine issues and help provide greater public support and acceptance of the **Blue Economy**
- Help create **new jobs** for the Limassol Shore Center and other maritime services

Our proposed solution contributes in the Blue Economy towards the creation of more skilled workforce regarding sea traffic management, VTS, port services and operations, safety and environmental issues

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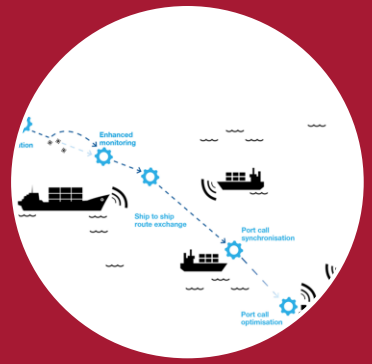
Impact on Participating Organizations

CUT	Form experienced scientists in the emerging fields of sea traffic management, e-navigation, and maritime informatics
RISE	Bring and adopt the STM/PortCDM concepts to Eastern Mediterranean as thought leaders in maritime informatics and co-founders of STM/PortCDM
CPA	Enhance knowledge of employees, improve services, influence policies
CSA	Promote the views of shipping agents and raise awareness
Tototheo, Delevant, CSCS	Bring in new knowledge and skills, improve portfolio, develop new competitive products and services
ALL	Create useful alliances and gained new state-of-the-art knowledge

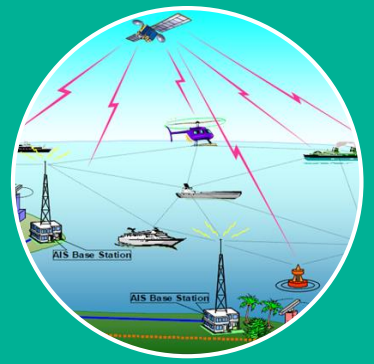
A long-lasting outcome of the project will be the creation of a "Maritime Innovation Hub", where the project members will continue to meet after the project ends and collaborate with other important bodies at regional, national, and international level aiming to holistically address challenges of the maritime sector

Conclusions

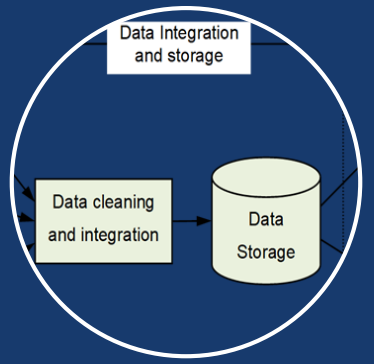
1. Improve the efficiency of various port operations and services by extending Port CDM



2. Optimize sea traffic navigation and facilitate short sea shipping by establishing Limassol Shore Centre



3. Collect real-time information related to ship movements, the environment, and the tracking of cargo



4. Ensure high quality data, calculate KPIs, and create new decision-support tools and services

5. Develop effective links and synergies among all interested maritime stakeholders in Living Labs

STEAM Project: Upgrade the maritime significance of Cyprus