

Integrated Technological Solutions in Modern Naval Construction: The Case of the Tamandaré Class Frigates Program

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Summary

01

POSITIONING
ABOUT
EMGEPRON

02

BUSINESS AND
MANAGEMENT
APPROACHES

03

KNOWLEDGE
MANAGEMENT
DURING THE
LCM

04

SUSTAINABLE
TECHNOLOGICAL
SOLUTIONS
APPLIED TO
NAVAL
CONSTRUCTION





“MANAGERIAL ENTERPRISE FOR NAVAL PROJECTS”





STRATEGIC VIEW

**“To Agregate Value by the mean
of the Ocean Economy”**

Strategic Business Segments



CLUSTER FOCUS OF INTEREST

SHIP BUILDING AND REPAIR

Merchant, Fishing, Nautical and Offshore Vessels

MARITIME SERVICES

Port Infrastructure and Operations, navigation and transportation, dredging and signaling and beaconing

DECOMMISSIONING AND DISMANTLING

Oil rigs and offshore vessels

EXPLORATION AND EXPLOITATION OF SEA RESOURCES

Pre-salt oil and gas, wind energy, fisheries, aquaculture and fish industrialization

DEFENCE, SAFETY AND MARITIME AUTHORITY

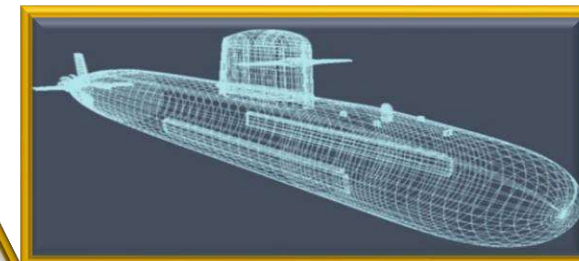
Navy Strategic Program, Safety and Security





BRAZILIAN NAVY STRATEGIC PLAN

SET OF NAVAL STRATEGICS CAPABILITIES



Brazilian Navy Strategic Projects



TAMANDARÉ
CLASS FRIGATES

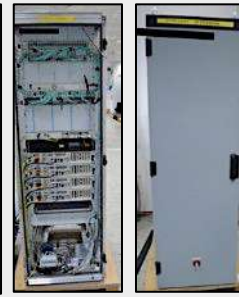


ANTARTIC
SUPPORT SHIP



OPV-MB 500 Ton

To establish in the country a capability of design, construction, integration and logistic support with high level of local content



IPMS

CMS



Length: 107,20 m

Beam: 15,95m

Draft: 5,2m

Displacement: 3.500 ton

Economic Speed: 14 knots

Maximum Speed: 26 knots

Range: 5.000 NM

Autonomy: 28 days

Crew: 136



**MARINHA
DO BRASIL**

A PARTNERSHIP !

EMGEPRON



National Capabilities

01

SCIENTIFIC

02

TECHNOLOGICAL

03

ENGINEERING

04

INDUSTRIAL

05

LOGISTICS

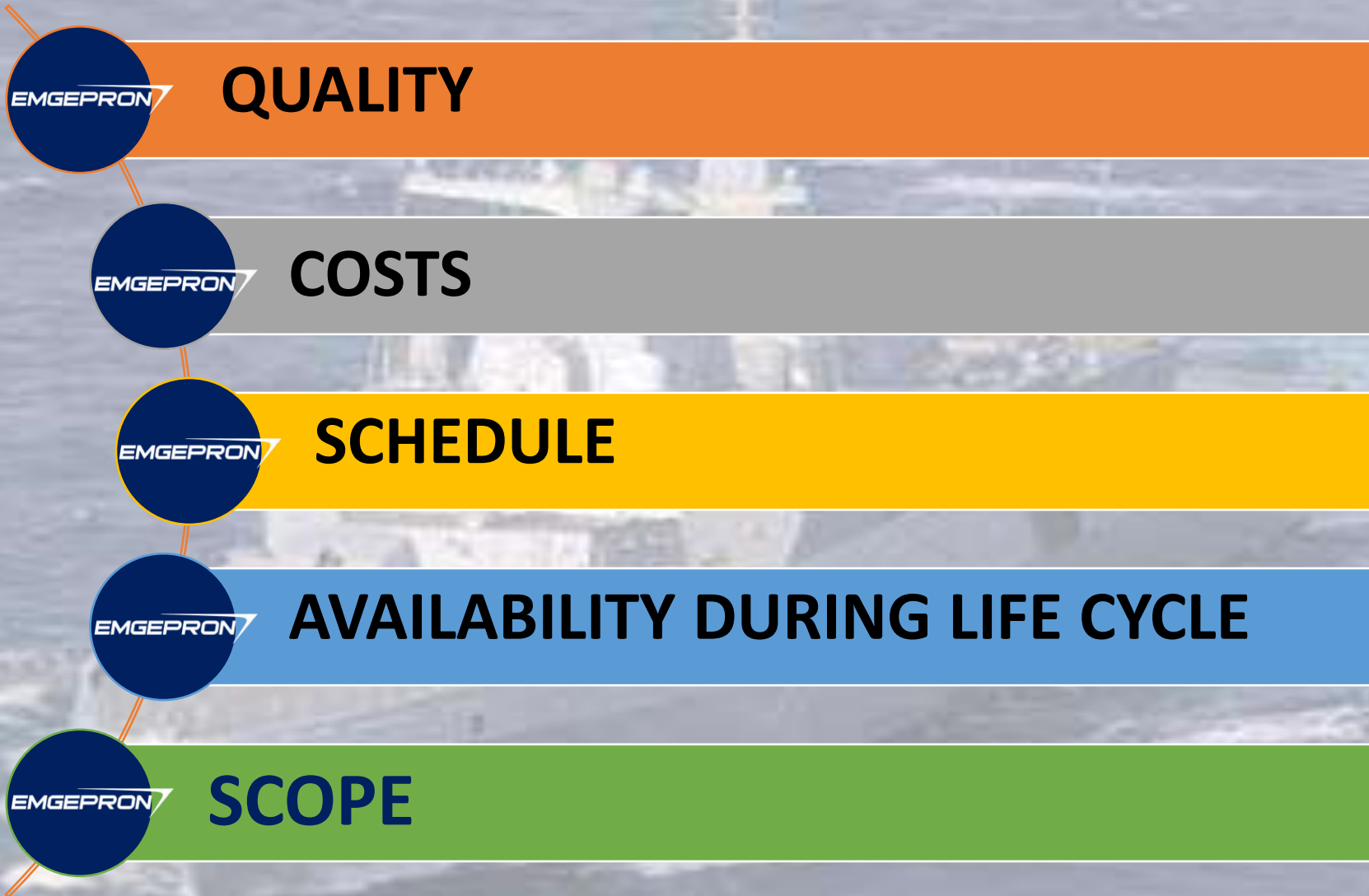
06

ECONOMICS

07

PLANNING,
GOVERNANCE &
MANAGEMENT

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DEFENSE, PROCUREMENT & ACQUISITION METHODOLOGY

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Critical Success Factor



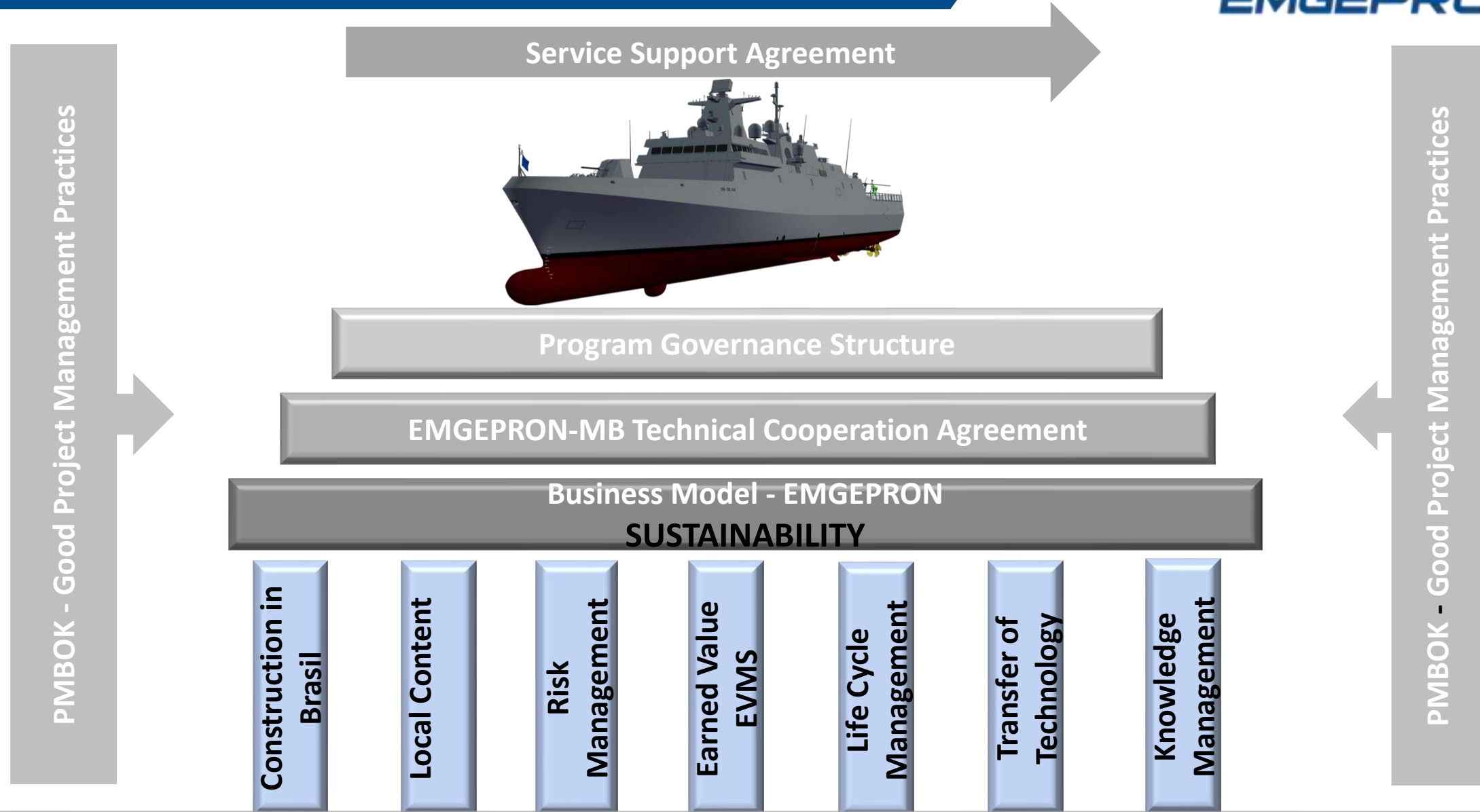
BUSINESS APPROACH

Acquisition Management Model

Economic & Financial Model



Project Management Environment



LIFE CYCLE MANAGEMENT (LCM)

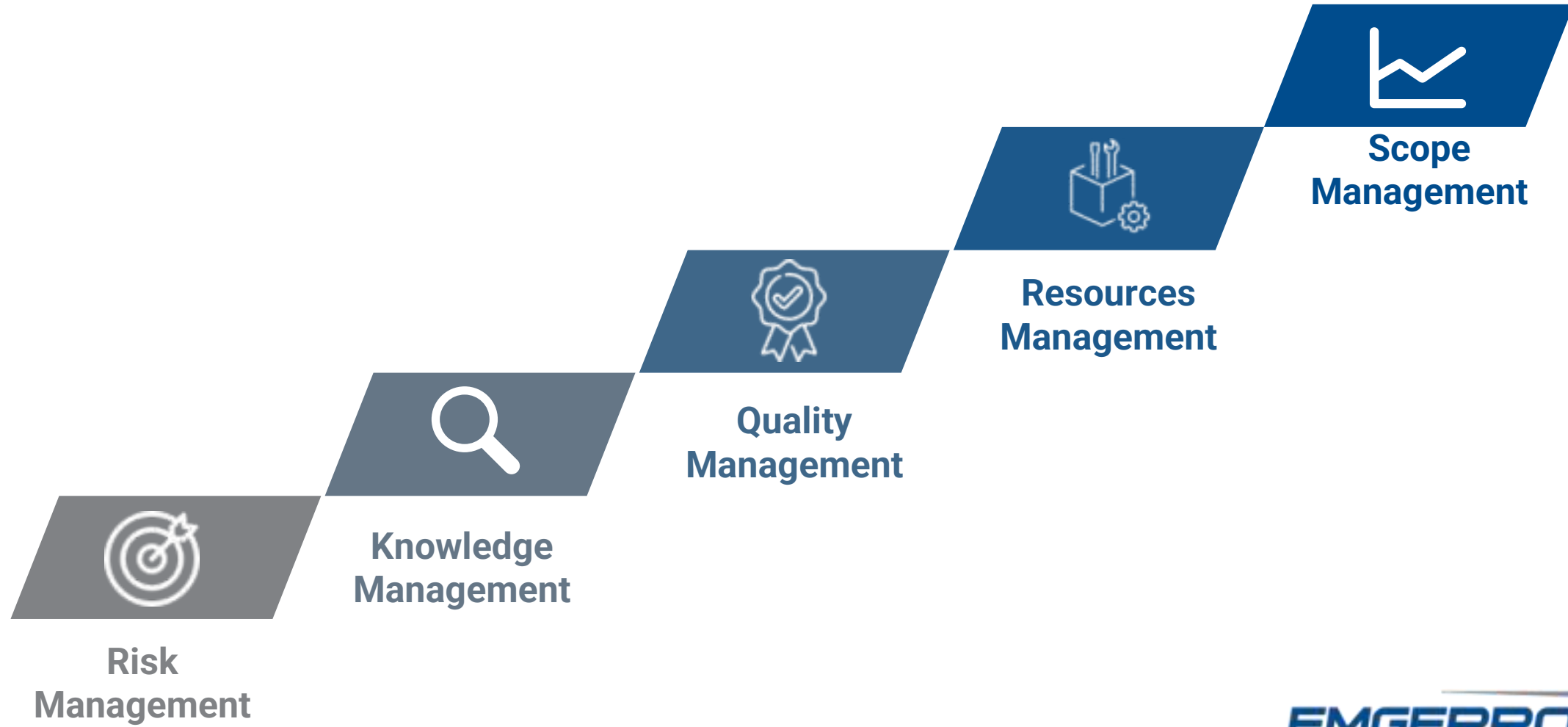


AN INTEGRATION BETWEEN:

- ✓ Systems Engineering
- ✓ Project Management



Program integrity should be assured by:



SCOPE IS UNDERSTOOD AS:

- **Governance & Management Structures**
- **Design & Engineering**
- **Construction & Assembly**
- **Participation of Local Content**
- **Transfer of Technology (ToT)**
- **Life Cycle Management & Integrated Logistic Support (LCM & ILS)**

SCOPE MANAGEMENT (TAMANDARÉ CLASS PROGRAM)



1- PROGRAM MANAGEMENT STRUCTURE

2 - MOBILIZATION

3 - EXECUTIVE PROJECT

4 - SHIP CLASS TAMANDARÉ # 01

5 - SHIP CLASS TAMANDARÉ # 02

6 - SHIP CLASS TAMANDARÉ # 03

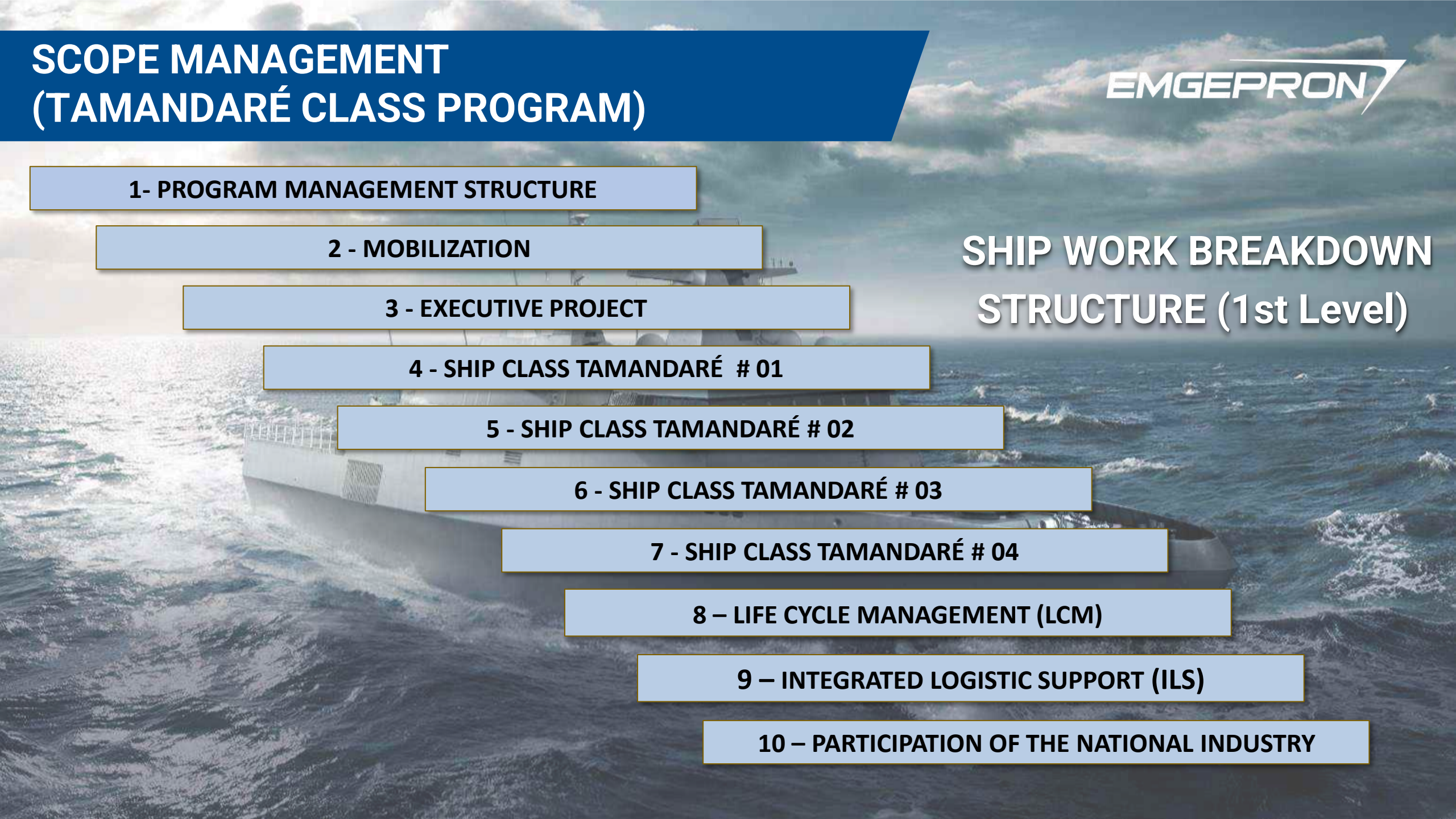
7 - SHIP CLASS TAMANDARÉ # 04

8 – LIFE CYCLE MANAGEMENT (LCM)

9 – INTEGRATED LOGISTIC SUPPORT (ILS)

10 – PARTICIPATION OF THE NATIONAL INDUSTRY

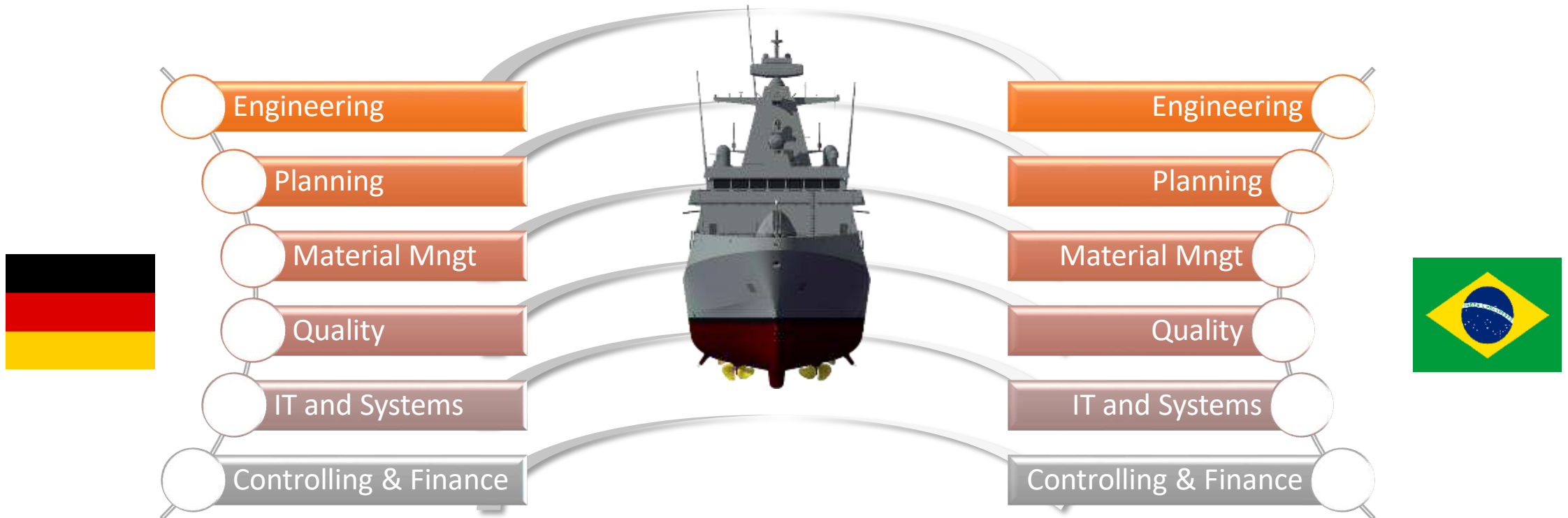
**SHIP WORK BREAKDOWN
STRUCTURE (1st Level)**



Preparation for production: ToT



Interface and direct interaction among the areas



LCMS Overview:



An integrated repository of knowledge



The MB LCM Solution Mission

- Secure Transition of the FCTs from SPE to the Brazilian Navy
- One single source of information to manage the FCT Life Cycle from Development to Operation and Support

- ✓ Integrated IT Architecture
- ✓ Supported FCT Life Cycle
- ✓ Stakeholder Collaboration
- ✓ Increase Operational Availability
- ✓ Minimization of Costs

The LCM Principles

Integral part of the Tamandaré Class Frigates Program strategy

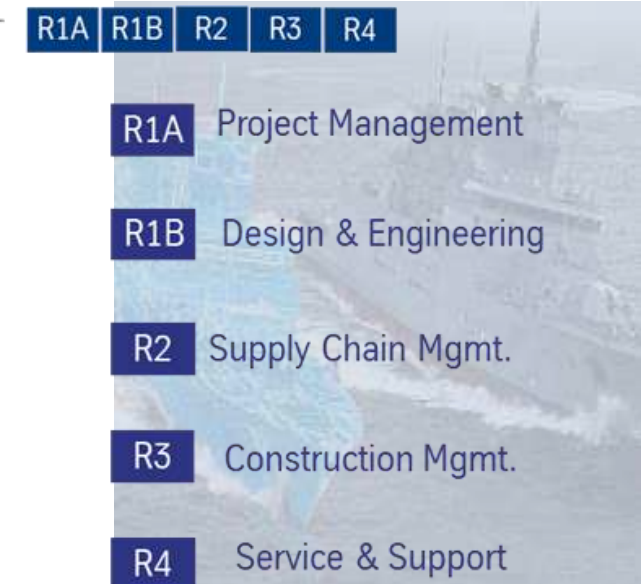
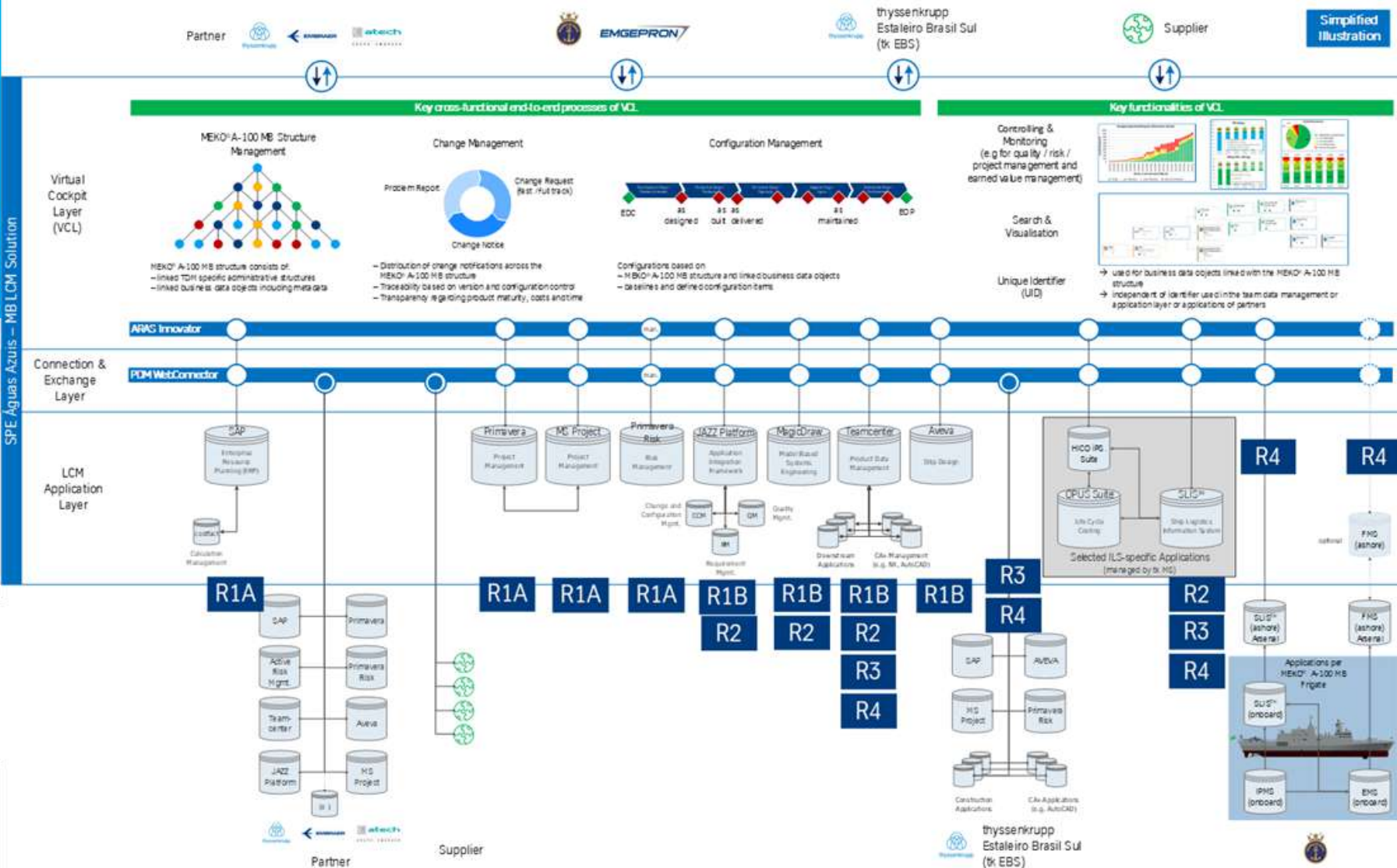
Integrated and shared product information

Complete and consistent product information

The Digital Twin

- Management of information for each FCT throughout its life cycle.
- Key to digital traceability.
- FCT specific configuration baselines.
- Drive change impacts on real instances by the digital twin.

LCMS Enterprise Information Architecture (LCM-MB)



**DIGITAL TWIN
CONCEPT**

tkmS Shipyard Brasil Sul



EMGEPRON

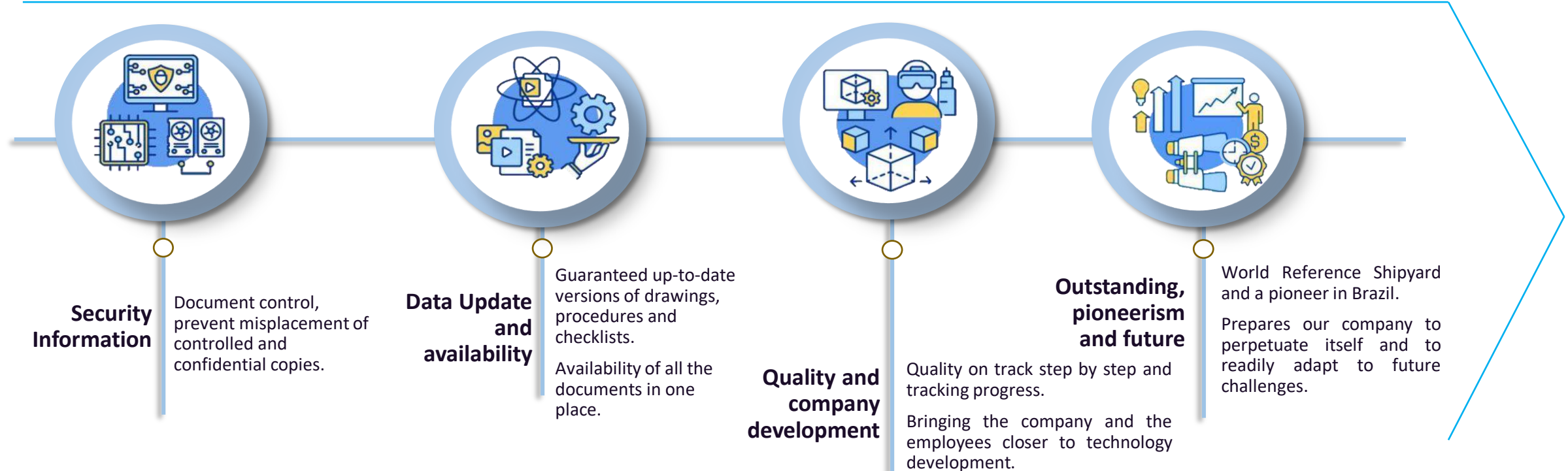
Sustainable technological solutions applied to naval shipbuilding

Paperless: on the edge of the technological construction

Committed to bringing technology and innovation to the naval production line, the implementation of the Paperless concept at thyssenkrupp Estaleiro Brasil Sul involves a change in the availability of documents for the factory floor. This novelty consists of adapting the productive drawings that were previously printed on paper, to drawings in digital form.

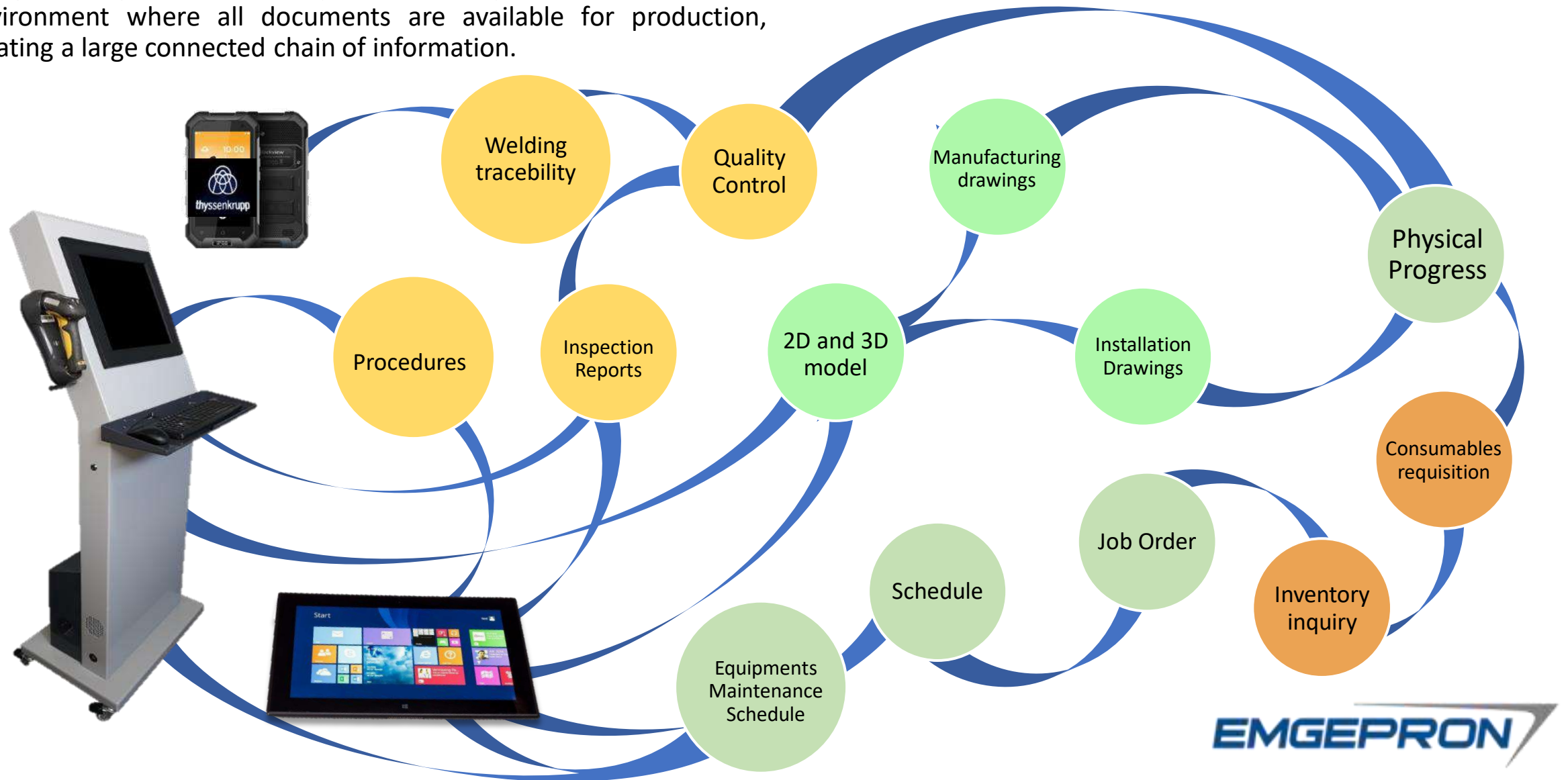


WHAT ARE THE MAIN OBJECTIVES?



Paperless: tools in use

Using the right tools and systems, it is possible to create an environment where all documents are available for production, creating a large connected chain of information.

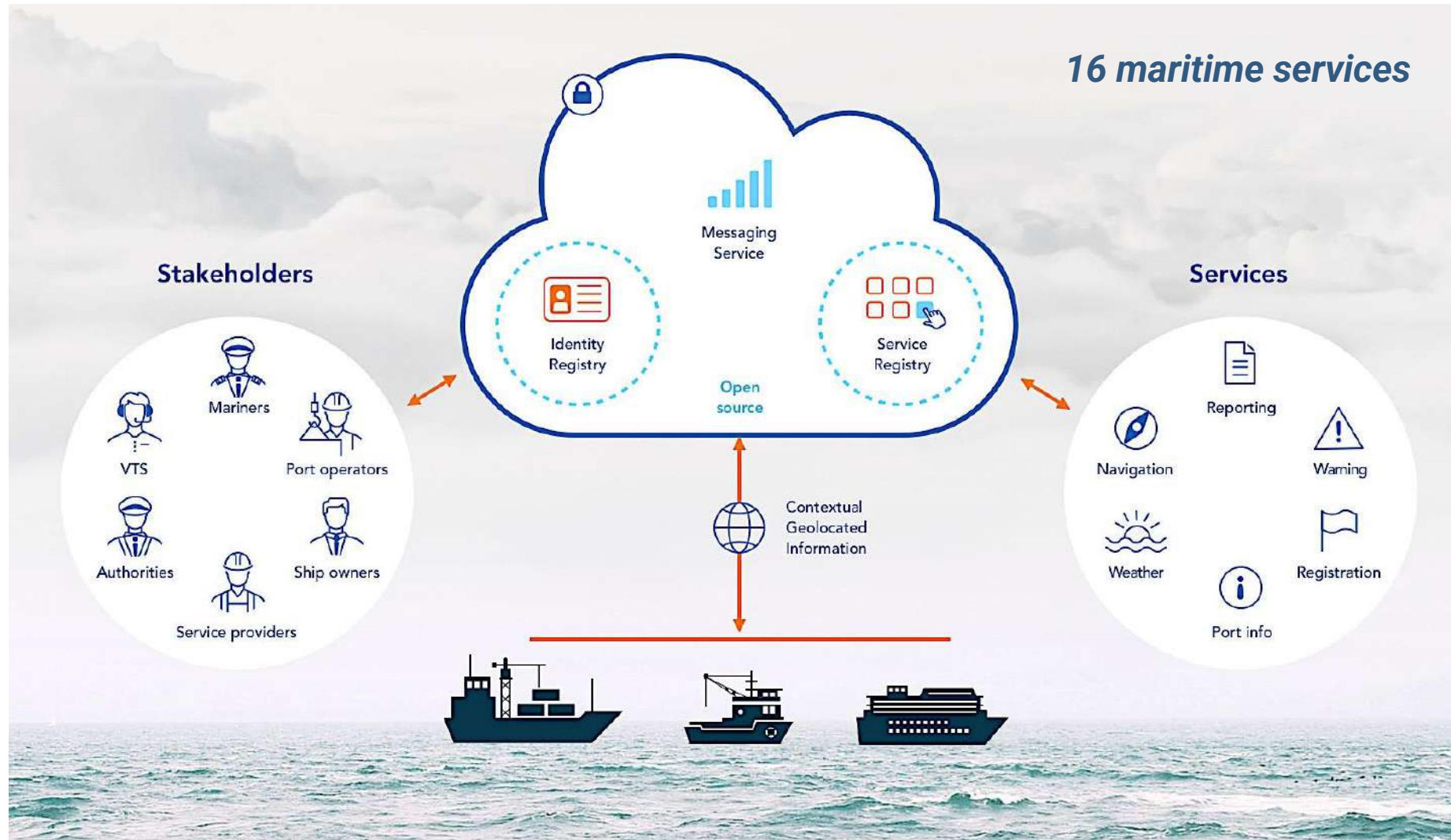


Paperless: tools under implementation

AUGMENTED REALITY GLASSES

- Equipment positioning conference;
- Visualization of interference between departments;
- Visualization of the layout of a compartment;
- Detailed verification of an equipment or assembly procedure.
- Quality Verification;





*Local Port Service
(LPS)*

*Vessel Traffic
Service (VTS)*

PMIS + VTS = VTMIS

*Vessel Traffic
Management
Information
System (VTMIS)*



Surface Autonomous System Project (USV)

EMGEPRON + **TIDEWISE**

A Brazilian Defense Strategic Company



Frigate Meko®A-100 MB

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