

4.0 challenges for the maritime sector

The Cyprus Marine and Maritime Institute approach

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“...new technologies that are fusing the physical, digital and biological worlds, impacting all disciplines, economies and industries, and even challenging ideas about what it means to be human. Previous industrial revolutions liberated humankind from animal power, made mass production possible and brought digital capabilities to billions of people...”

Prof Klaus Schwab
Founder and Executive Chairman of the World Economic Forum

The Maritime Sector Major Challenges

Digital Transformation

Decarbonisation

Autonomous ship: IMO Levels of Autonomy

Ship with automated processes and decision support. Seafarers are on board to operate and control shipboard systems and functions. Some operations may be automated and at times be unsupervised, but with seafarers on board ready to take control.

Remotely controlled ship with seafarers on board. The ship is controlled and operated from another location. Seafarers are available on board to take control and to operate the shipboard systems and functions.

Remotely controlled ship without seafarers on board. The ship is controlled and operated from another location. There are no seafarers on board.

Fully autonomous ship. The operating system of the ship is able to make decisions and determine actions by itself.

The Digital Twin Ships

VIRTUAL WORLD phases	REAL WORLD phases
	Bid
Detailed design digital mock-up	Detailed design
Logistic Configuration Gradual Integration	Production Engineering
Digital Twin Creation	Production
	Guarantee
Life Cycle Supporting Services	Maintenance
Continuous Configuration Update	

Maritime Sector related technology trends

- Airborne unmanned vehicles for inspection
- Under water unmanned vehicles for inspection and maintenance
- Autonomous ground port vehicles for transport
- Remotely operated port cranes
- Human – Robot interacting systems

Source: TRANSPORT 2040 AUTOMATION, TECHNOLOGY, EMPLOYMENT: THE FUTURE OF WORK (WMU)

Jobs in demand

Specialists in:

Energy Efficiency Optimization

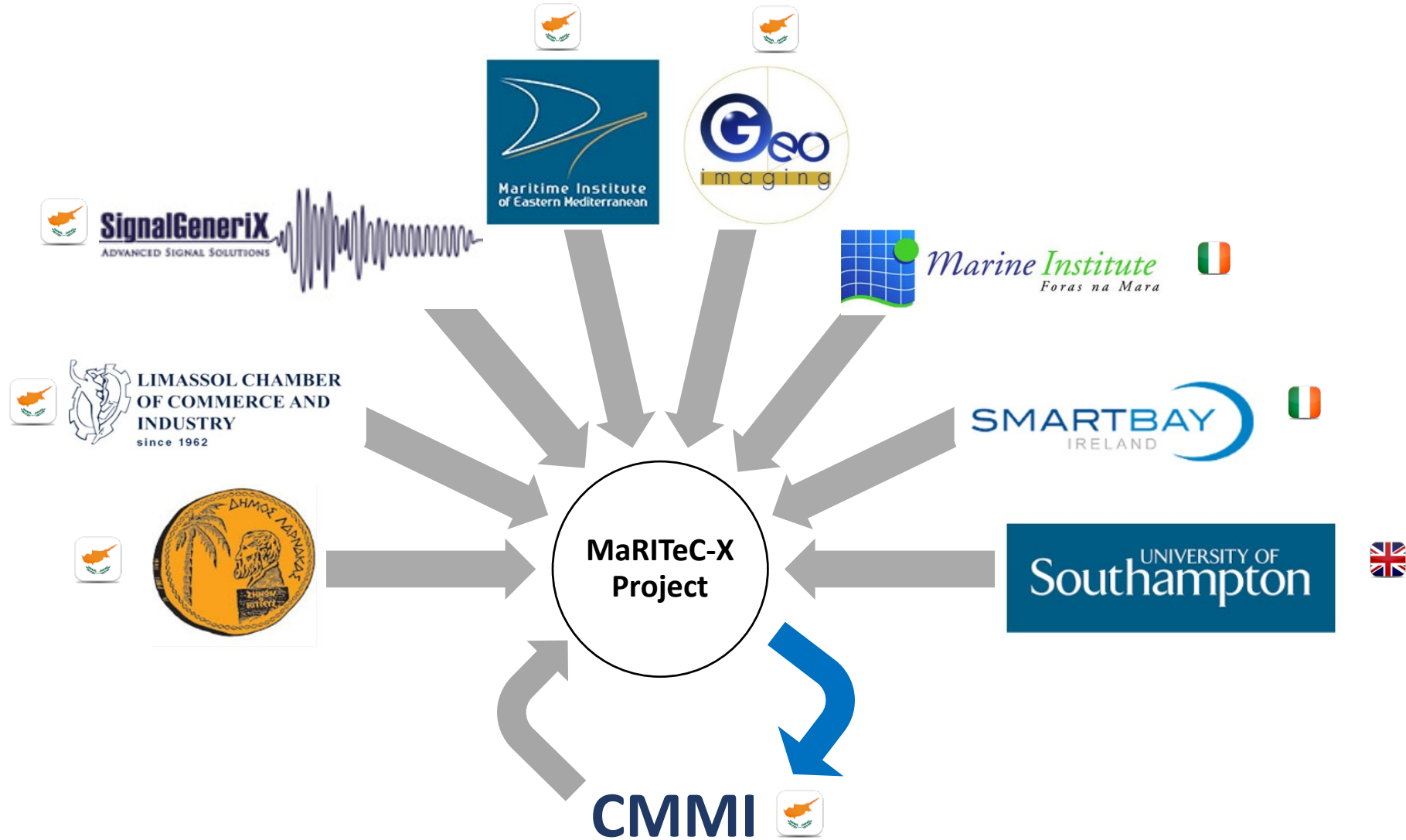
Ship Automation and Autonomy

Cyber Security and Data Protection

Big Data Analysis

3D/4D Printing

The MaRITeC-X Consortium



Driven by the Needs of the Industry and the Society!

The CMMI Vision

To carry out Research, Technology Development & Innovation – RTDI activities **in order to provide** practical solutions **to the challenges that the marine and maritime industry and the society face or will face in the future.**

Global Challenges Clusters (GCCs)

- Maritime Trade and Transport
- Marine Bioresources
- Energy and Subsea Resources
- Climate and the Environment
- Society and Governance



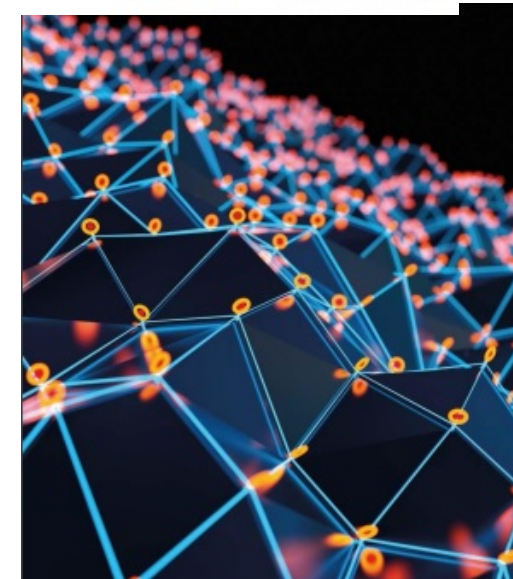
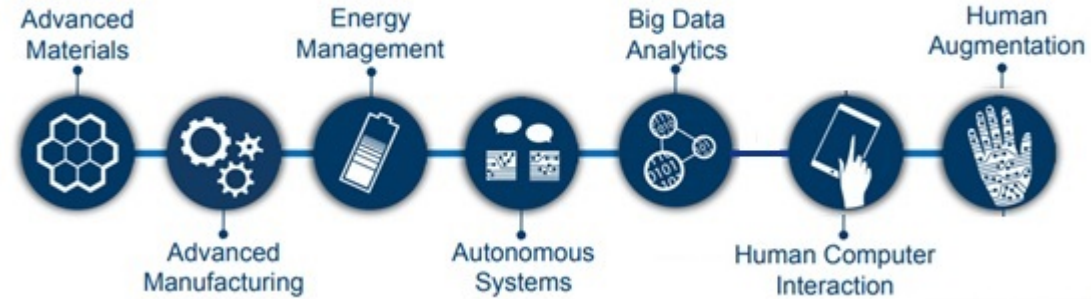
CMMI Key Areas of Expertise

- Big Data and Cybersecurity
- Robotics and Autonomous Systems
- Materials, Structures and Testing
- Environmental Modelling and Mapping
- Energy and Subsea Resources
- Vessel Design and Performance
- Marine Bioresources & Ecosystems
- Ports, Logistics and Tourism
- Safety, Risk and Regulation
- Society, Culture, and Heritage



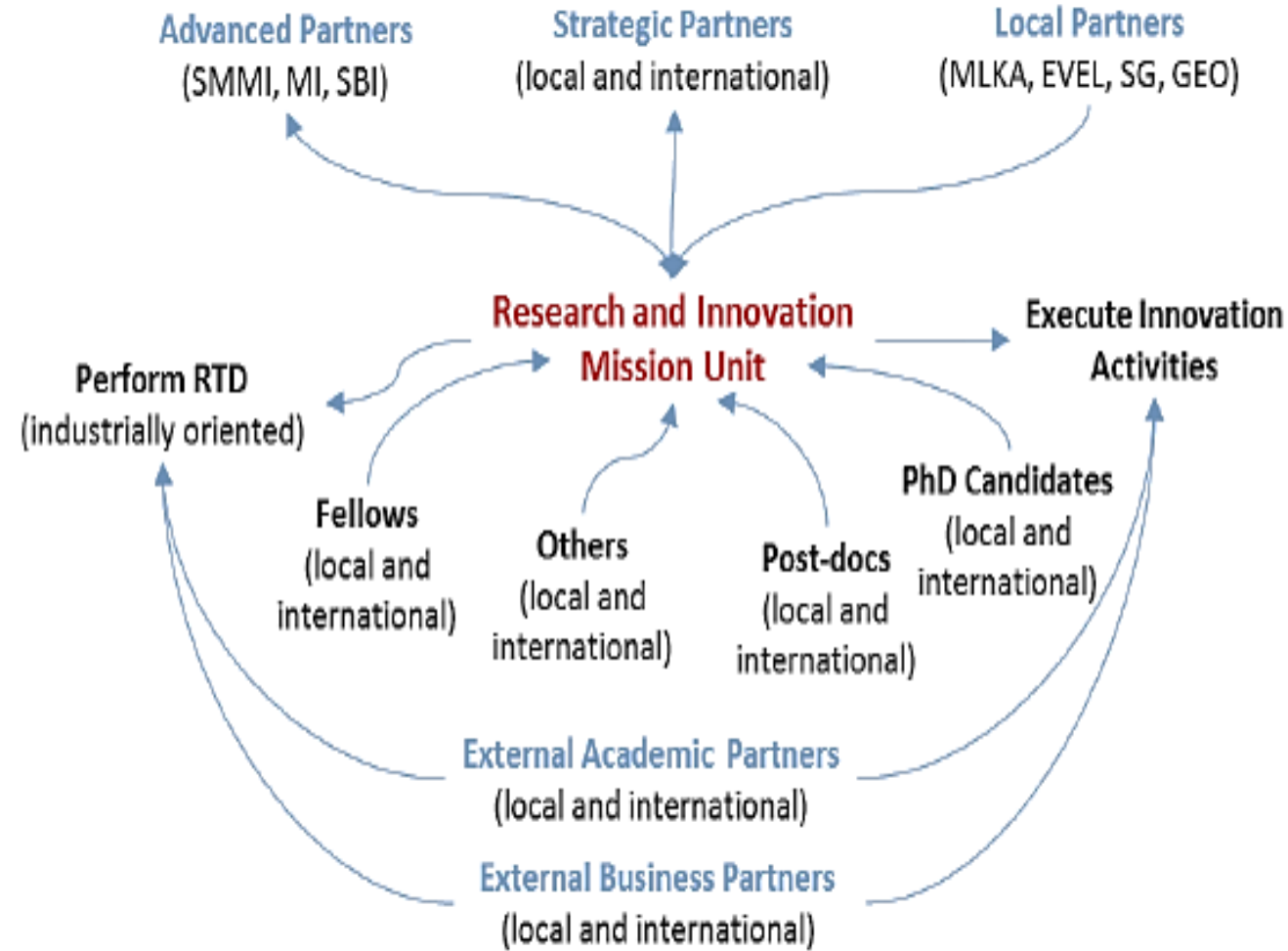
The Technologies Transforming the Marine & Maritime Industries

- Advanced Materials
- Sensors
- Marine Biotechnology
- Big Data Analytics
- Deep Ocean Mining
- Cyber Security
- Robotics
- Communications
- Internet of Things
- Autonomous Systems
- Human–Computer Interaction
- Human Augmentation
- Shipbuilding
- Propulsion and Powering
- Advanced Manufacturing
- Carbon Capture and Storage
- Energy Management
- Sustainable Energy Generation



Source - Global Marine Technology Trends 2030

From Global Challenges Clusters to Missions, Initiatives and Solutions



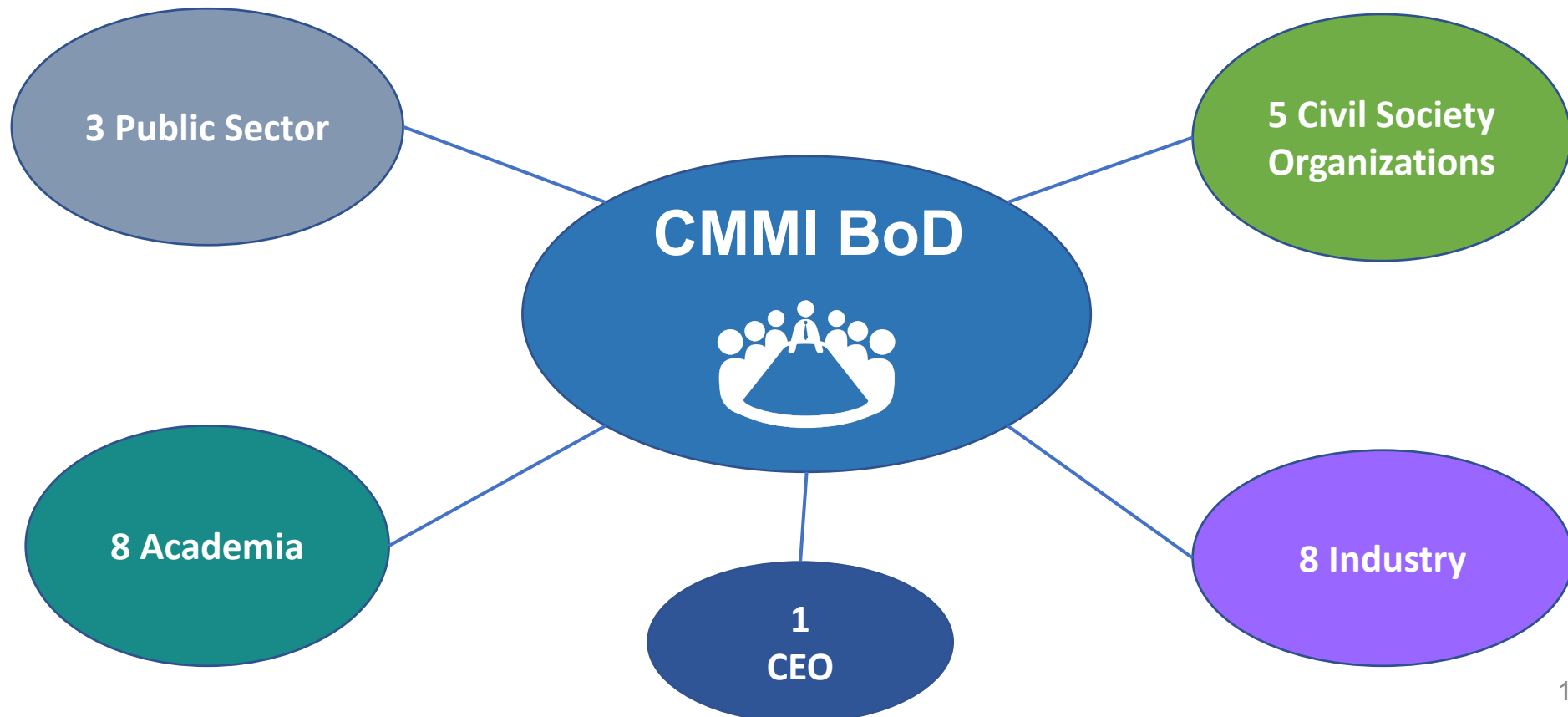
CMMI – Indicative Missions

GCC	Mission
Maritime Trade and Transport	<ul style="list-style-type: none"> • The Autonomous Ship (steps: Smarter Ship, Remotely Controlled Ship) • The Argonauts of the Future – Developing the operators of future ships • The Port of the Future – Future Supply Chain Services
Marine Bioresources	<ul style="list-style-type: none"> • Sea of Food – Feeding the world from the Sea – Offshore Aquaculture • Marine Protected Areas in the Eastern Mediterranean • PharmaSea – Medicines from the Ocean
Climate and the Environment	<ul style="list-style-type: none"> • A Plastics Free Ocean – Tackling the threat of the plastics in our Ocean • The Zero Emissions Ship (steps: Optimized Ship, Low Carbon Ship) • The Cyprus Marine Observation Network
Energy and Subsea Resources	<ul style="list-style-type: none"> • Marine & Maritime Living Lab / Marine Testing & Demonstration Facility • A Research [and Training] Vessel for Cyprus • Harvesting the energy of the Ocean
Society and Governance	<ul style="list-style-type: none"> • Preserving our Maritime Heritage • Mediterranean 2050 – A Regional cooperation Initiative • Building a civic relationship with the Ocean - Ocean Literacy programs

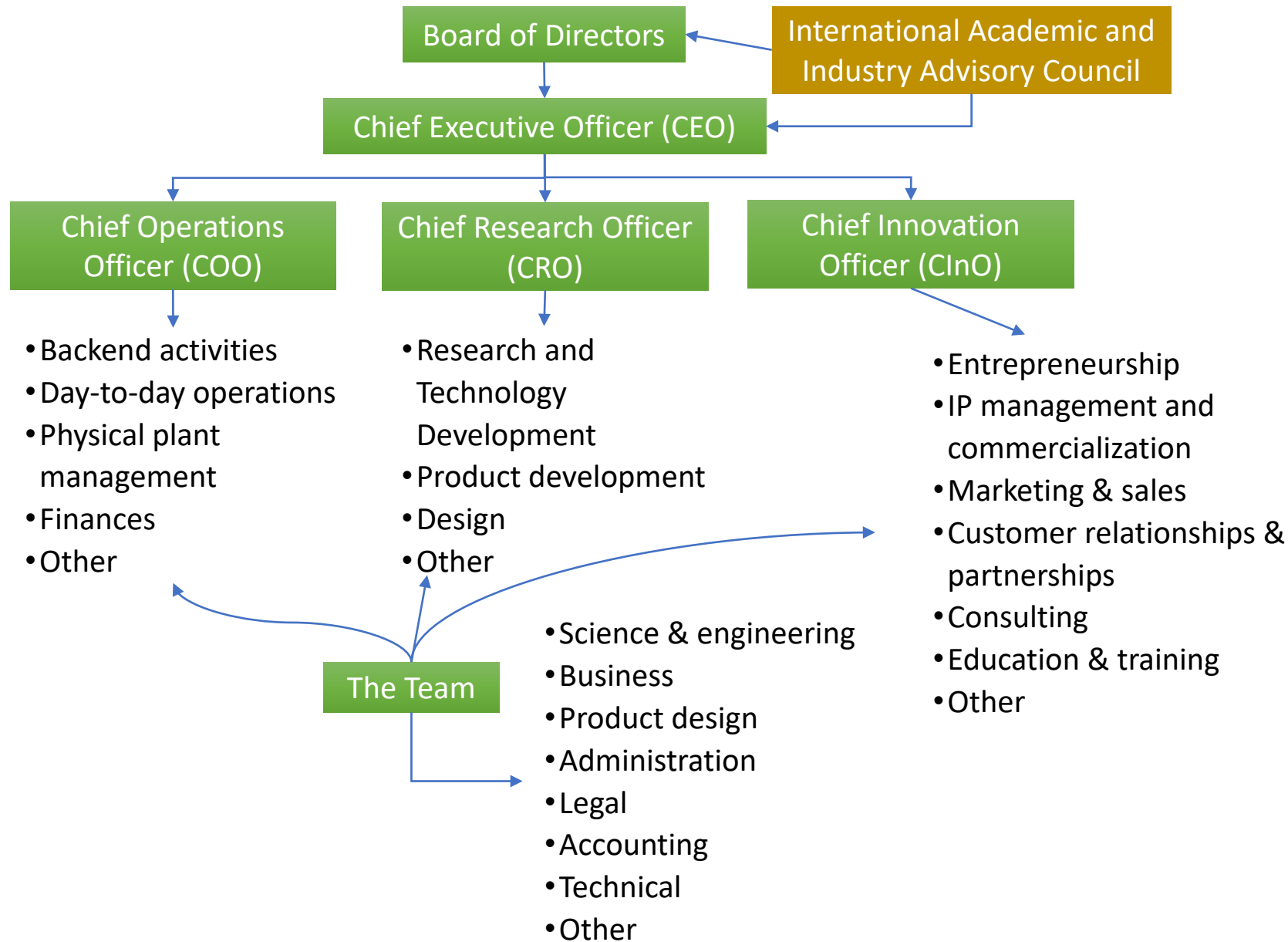
CMMI Legal Entity

CMMI has been incorporated under Cyprus law as

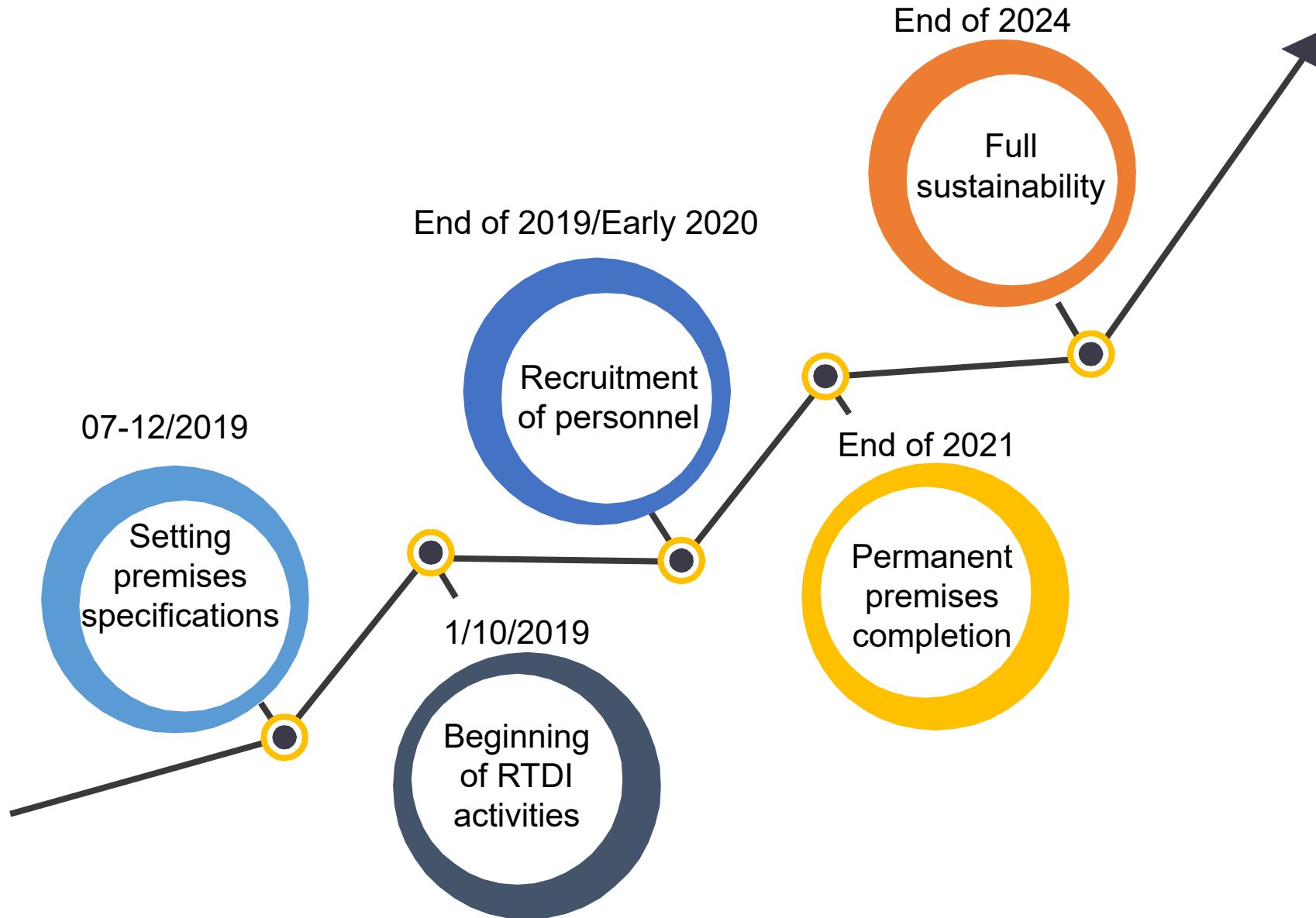
- A Non-for-Profit Limited liability company
- With public equivalent body status (as defined by the EU)
- With a Board of Directors (BoD) of 25 members



CMMI Organizational Structure



CMMI Timeline



Join forces with the CMMI

The new entity is open to all Blue Economy stakeholders.

By partnering with the CMMI you are joining one of the most important investments in marine and maritime RTDI in the EU, and have the possibility to:



✓ Shape the future research and technology development priorities of the Centre



✓ Have a say in the governance of the Centre



✓ Be the first to know about critical research results, new technologies and innovation activities

✓ Take advantage of technology commercialisation possibilities



✓ Co-design and develop activities for mutual benefit

✓ Outsource solution development for your problems, products and services, by capitalising on our state-of-the-art facilities and people



✓ Find new partners and customers for your activities, products and services



Thank you for your attention



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