



Autonomous ships: The future of the maritime industry Challenges, technology practices, and use cases



INDEX

Introduction

Section 1

Five key challenges of autonomous ships

Section 2

Four best technology practices

Section 3

Use cases of autonomous vessels

Conclusion



WATCH DIGITAL FUTURES
VIDEO

DIGITAL FUTURES

DIGITAL FUTURES is an online content publication platform catering for technology business leaders, decision makers and users, by sourcing and sharing valuable information and best practices in connection to the latest emerging technologies trends and market developments that leverage capabilities and contribute towards enhanced enterprise-wide performance.



WATCH VIDEO

LEARN MORE >

Introduction



Evidently, the introduction of the Marine Autonomous Surface Ships (MASS) into the maritime sector led to a new age and a new paradigm shift in terms of efficiency, maritime accidents, and other challenges. Various research is now being conducted around the topic of MASS. Autonomous and unmanned ships are novel concepts that fundamentally alter the way ships and their systems are designed, tested, and operated. Autonomous shipping is an innovative development in the maritime industry.

Under a regulatory perspective, a 'Maritime Autonomous Surface Ship' (MASS) is described as a vessel that can operate autonomously at a range of degrees. To facilitate the regulatory scoping process, the following degrees of autonomy are structured (non-hierarchically) as follows (it was highlighted that MASS may operate at one or more degrees of autonomy during a single voyage).¹

1. International Maritime Organization. (2018, May). IMO takes first steps to address autonomous ships.

Introduction

Section 1

Section 2

Section 3

Conclusion



Degree one

The following levels of autonomy were identified during the scoping process:

Ship with automated processes and decision-making support | Seafarers are on board to run and control the ship's operating systems, and they are responsible for their safety. Some activities may be automated, and sometimes unattended, but there will always be seamen on board, ready to take over if necessary.

Degree two

Remotely controlled ship with seafarers on board | Control and operation of the ship are located somewhere else. On board, seafarers are available to assume command and run shipboard operating systems.

Degree three

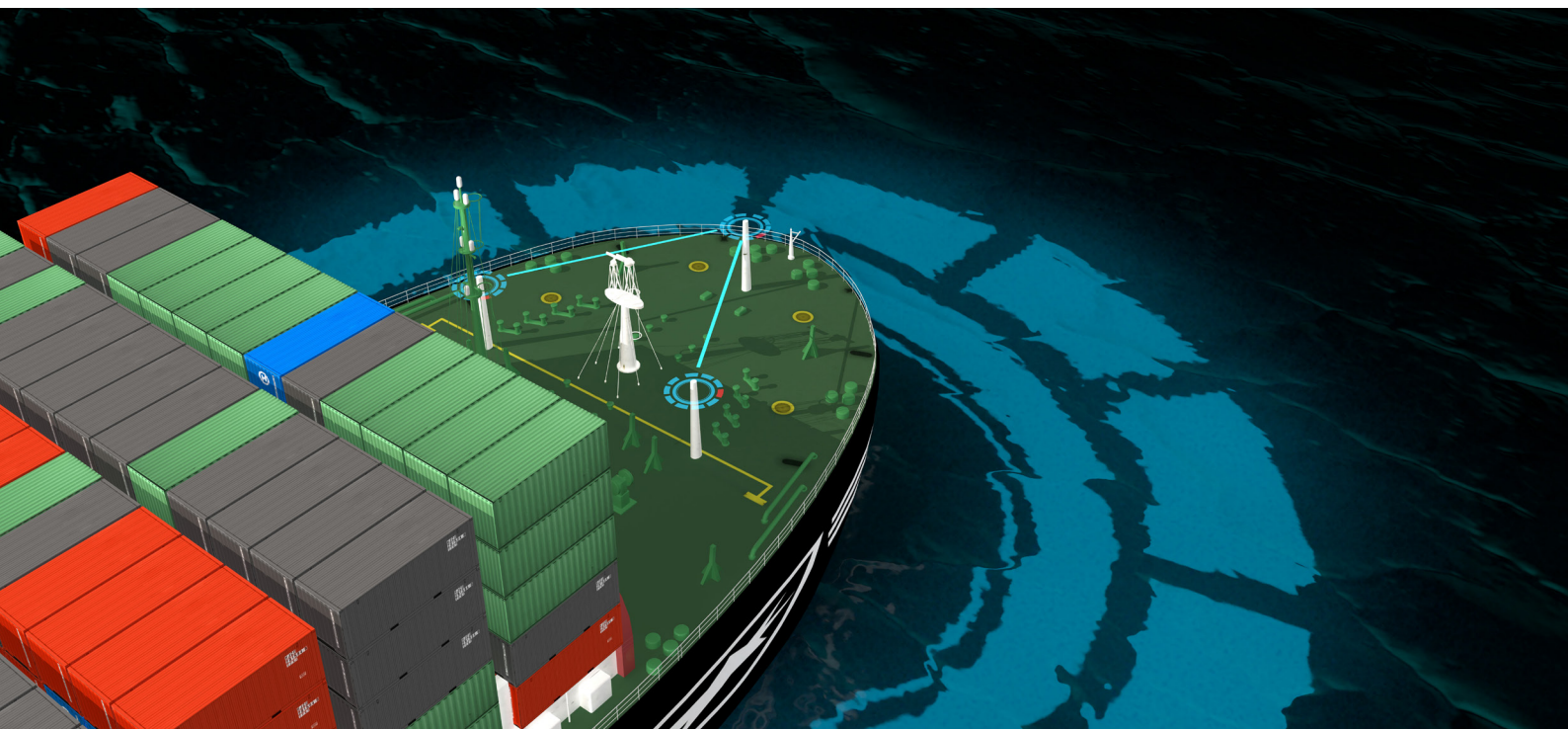
Remotely controlled ship without seafarers on board | Control and operation of the ship are located somewhere else. There are no seafarers on board.

Degree four

Fully autonomous ship | The ship's operating system can make decisions and take actions on its own.²

2. International Maritime Organization (IMO). (n.d.). Autonomous shipping.

The autonomous ship market is expected to grow at a CAGR of 6.8 percent from 2020 to 2030, reaching USD 165.61 billion in 2030. Autonomous ships are classified by the level of autonomy, ship type, fuel type, components, and geographical location. The industry is expected to increase in Asia-Pacific, because the region has many ship owners and autonomous driving. Therefore, due to increased safety standards, the demand for autonomous ships is expected to rise. Rapid developments in the maritime sector while enhancing ship operating safety are two major drivers of market growth. There are also built-in components like AI and IoT, advanced navigation systems, and others that improve ship operation, increasing the market demand for autonomous ships. However, network complexity and the possibility of cyberattacks jeopardize industry growth. There is also a growing tendency towards total automation in the transportation sector, where various new business prospects are expected to unfold.³



3. Jadhav, A., Mutreja, S. (2021). Autonomous ships market growth, companies, trends by 2030. Allied Market Research.

[Introduction](#)[Section 1](#)[Section 2](#)[Section 3](#)[Conclusion](#)

Nowadays, technological breakthroughs are constantly emerging and autonomous vessels are gaining momentum in the maritime industry. Although autonomous shipping is considered technically feasible, there are many obstacles ahead to bring this dream to life. Issues such as legality, safety, and cyber security are likely to keep the number of autonomous vessels from growing in the near future. The most critical challenges for autonomous shipping are found in this research paper, which gives a global perspective of the most significant industry challenges.

Lately, a lot of research and industry endeavors have been focusing on the development and construction of automated vehicles. Considerable attention has been given to the design and implementation of autonomous and remote-control features within the marine sector. It is more likely that autonomous vessels will operate with little or no human intervention. Applications range from remote control to ships that can make decisions and take actions free from human involvement.

Significant milestones are constantly attained around the world. Numerous projects have been completed or are in the process, all of which require the availability of resources to construct autonomous vessels. However, developing these technological buildings blocks into actual systems and control algorithms is time-consuming. At the moment, some small vessels can operate independently or via remote control but not cargo.

This study identifies necessary technologies and best practices for MASS operations through a literature review, which is the key source for future research on practical MASS operations and identifying its safety challenges. To conclude, this research paper reveals the existing challenges to safe operations, as well as best practices and innovations in the field of autonomous technology.

SECTION 1





SMART PAPERS



FOLLOW OUR THINKING :



Designed and produced by APU Insights Creative Studio
2022 © APU Commercial Information Services
All Rights Reserved