The Use of Artificial Intelligence in the Maritime Context: Legal Challenges and Implications for Sustainability

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Introduction

In June 2022 a cargo ship transporting liquid natural gas from Texas to South Korea made the headlines. At a first glance, this does not seem to be an extraordinary piece of news. What makes it remarkable is the fact that most of the decisions during navigation were not taken by a human captain, but by a computer.[1] The use of artificial intelligence (AI) is constantly increasing, and the maritime sector is no exception: algorithmic systems can be used in maritime surveillance, calculating shipping routes or mitigating pollution. In the future we might see a global Internet-of-Things-based system of intelligent ships and smart ports. However, users and potential users face legal uncertainty at this point: there is no binding regulatory framework in AI in force yet. In addition, its use in the maritime sector would be – at least in EU marine waters – at the intersection of EU law and international law, namely maritime law and the law of the sea. The majority of treaties and regulations applicable to the maritime sector have been adopted long before digitalisation reached today's level. Therefore, the increasing use of AI can pose challenges to the applicability of these rules. Legal certainty is crucial to foster the adoption of these new technologies.

Materials and methods

For the purpose of this contribution, the main method will be the doctrinal legal method. Based on a *de lege lata* analysis, existing rules will be examined with regard to their applicability to new technologies. This allows to point out regulatory gaps. A *de lege ferenda* approach will screen recent legal proposals as to whether they are applicable to AI used in the maritime sector, and whether they are adequate to address the imminent challenges. Recommendations will be given in terms of how to address possible regulatory gaps, inconsistencies and overlaps – both in terms of EU law and international law.

The materials used for this research range from legislative texts – both existing regulations and proposals – through policy papers issued by EU institutions and international bodies, such as the International Maritime Organisation (IMO), to academic contributions, namely research articles and books. Where appropriate, also newspaper articles, press releases and established blog posts will be considered.

Results

At this stage, it is impossible to provide definitive results. The technological development is ongoing. Likewise, regulation of AI and other new technologies is a work in progress. EU institutions expect the AI Act to enter into force by the end of 2023, or in early 2024. At the same time, one must observe how for instance the IMO continues its regulatory approach to new technologies. In 2021, they

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[1] Beutelsbacher, 'Neue Ära der Seefahrt – Computer übernimmt das Steuer eines gigantischen Frachters' Die Welt (Online, 12 June 2022) <https://www.welt.de/wirtschaft/article239315397/Schifffahrt-Selbstfahrender-Tanker-ueberquert-den-Ozean.html>.

finalized a so-called Regulatory Scoping Exercise, which found that several issues needed to be addressed. Among these are the development of a terminology related to Marine Autonomous Surface Ships, and updated definitions for terms like "master", "crew" or "responsible person".[2] At this point, one does not know either how far-reaching the regulatory efforts undertaken by the IMO will be, whether they will limit themselves to vessels, or whether they will aim to regulate other maritime AI. Close cooperation between the EU and IMO would be recommendable to avoid contradictions, gaps and overlaps.

There is a considerable risk that persistent legal uncertainty could discourage stakeholders from adopting new technologies due to a lack of knowledge regarding what exactly are their rights and duties, and what they might be held accountable for.

Implications on sustainable maritime operation

AI and big data enhanced maritime operations can have a positive impact on economic and environmental aspects of the maritime business. If the large amounts of data generated by the industry are used accordingly in decision-making, maritime safety will improve, and costs and environmental impacts can be minimised. It will likely help achieving the Sustainable Development Goals (SDG's). Particularly relevant for the maritime context is SDG 14, life below water, including the conservation and sustainable use of the oceans, seas and marine resources for sustainable development.[3] More precisely, this signifies that countries must prevent and significantly reduce marine pollution of all kinds by 2025, particularly from land-based activities, including marine debris and nutrient pollution.[4]

 Autonomous and remote-controlled vessels could provide a more effective solution for oil spill response. Drones can help combatting plastic pollution. Satellite images can record environmental changes and sensors on submarine internet cables can collect data about the seabed. AI and Big Data can also play a major role in the future with regard to achieving the goals enshrined in the BBNJ treaty.[5]

However, the currently fragmented legal landscape contributes to legal uncertainty. Providers and users of these technologies are often operating in a legal void, which can render their implementation less attractive. As long as no binding framework on AI is in force, providers and users of the systems have no clear knowledge regarding their specific obligations. And even if the AI Act is in force at some point, uncertainties may remain.

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[2] Argyro Kepesedi, 'Maritime Autonomous Surface Ships: A critical 'MASS' for legislative review', Article No. 97 [UNCTAD Transport and Trade Facilitation Newsletter N°96 - Fourth Quarter 2022] (Online, 13 December 2022) < https://unctad.org/news/transport-newsletter-article-no-97-fourth-quarter-2022>.

[3] International Maritime Organisation, '14 Life Below Water: Conserve and sustainably use the oceans, seas, and marine resources for sustainable development'
<https://www.imo.org/en/MediaCentre/HotTopics/Pages/SustainableDevelopmentGoals.aspx#number14>.

[4] L Segui et al, 'Leveraging earth observation data at the science-society interface: tools to help countries monitor and mitigate marine pollution' (2020) American Geophysical Union, Fall Meeting, abstract. <https://ui.adsabs.harvard.edu/abs/2020AGUFMSY0350014S/abstract>.

[5] IOC and UNESCO, Non-Paper on existing and potential future services of the IOC-UNESCO in support of a future ILBI for the conservation and sustainable use of biodiversity beyond national jurisdiction (BBNJ), IOC Information document N° 1387, Paris, September 2020, 17.