

# Human-centred policy development for the maritime industry

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## SUMMARY

This paper presents a novel methodological approach to safety regulation for the maritime sector. It describes the use of ‘serious gaming’ to explore the impact and support the implementation of emerging and future technologies in the policy-making process. The development and application of the ‘serious gaming’ framework is described and demonstrates the potential benefits of applying a design-led approach to policy development in enabling innovation, contributing to regulatory change, and delivering improved outcomes for seafarers, industry, and the wider society.

## KEYWORDS

Maritime, Policy, Technology, Innovation, Design Thinking, Human-Centred Design

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## Policy Context

The maritime industry is experiencing a technological revolution. It is forecast that innovation in autonomy, digitalisation, connectivity, and smart shipping will improve the safety, cleanliness, and efficiency of the sector, and is anticipated to create new, highly skilled job opportunities to improve the attractiveness of maritime careers to a more diverse workforce (Department for Transport, 2019). However, new disruptive technologies continue to emerge and may change the sector in ways we can’t yet anticipate.

The maritime safety regulatory regime has historically relied on learning lessons from the accidents and incidents of the past, in order to prevent their reoccurrence in the future. However, the rapid advance of technology and the arrival of Industry 4.0 add further complexity to the intricate network of sociotechnical systems, contractual, and organisational structures that exist within shipping. This is likely to contribute to a different pattern of incidents, and even the most well-established technologies might still have unanticipated impacts (Pomeroy & Earthy, 2017). What is clear is that this risk can no longer be adequately addressed by the maritime industry’s reactive response to safety.

## Policy by Design

Design-led approaches to policy development are emerging as a promising solution to address innovation in the changing policy landscape, and have been applied with success across government agencies to drive innovation and manage change in a number of safety-critical domains (Boyer et al., 2011; Kimbell, 2015). However, the terminology surrounding design thinking in the public sector is not yet clearly defined. As this new paradigm of design research continues to develop (Bason, 2018) a number of different participatory design practices have emerged, including co-creation; co-design; service design; experience-based design; strategic design; and design-driven innovation. Many of these concepts appear to have substantial differences in theoretical construct, application, actors and the nature of their involvement, and outcomes (Sanders & Stappers, 2008).

However, what these methods share is a fundamental alignment with human-centred design principles (Micheli et al., 2019). They explore problems and generate solutions by drawing on the diverse perspectives of participants to build consensus and tackle complexity through iterative cycles of learning (Kimbell, 2015).

### **Policy Development**

The Maritime and Coastguard Agency (MCA), the UK's maritime safety regulator, is responsible for implementing domestic and international law, producing safety legislation, policy and guidance on maritime matters, and in recent years has embraced innovation in its policy-making process. In 2019, the MCA collaborated with the UK Cabinet Office's Policy Lab to establish the Maritime Autonomous Regulation Lab (MarLab) and develop a 'serious gaming' framework to explore the future of maritime regulation (MCA, 2020). Between 2019 and 2023, the playable system was further developed to explore five separate areas of innovative UK policy with key stakeholders. It has also been presented on the international stage, where it has garnered positive interest from other maritime administrations.

The game itself began with the description of a scenario or 'mission', created to model and stress-test a specific policy area, instrument, or problem. To complete the mission, players had to work together to design a vessel, which would be approved on the basis of the regulatory framework under review. Players progressed through the game by selecting mission cards to move across the gameboard. These cards provided scenario injects, such as introducing a new hazard, or posing a question which prompted the player to make a decision, choose from the available options or consider the scenario in the context of the wider policy landscape.

### **Key Findings**

'Serious gaming' is a powerful methodology for decision-making, enabling policymakers to better understand regulatory challenges and stress-test possible solutions at pace (Sabherwal et al., 2024), and was found to have several benefits in the regulatory environment as a mechanism for:

- Increasing stakeholder engagement in the policy-making process.
- Considering diverse perspectives, clarifying different positions, and reconciling competing objectives to reach a common understanding of the policy problem.
- Encouraging creativity, experimentation, and 'out-of-the-box' thinking, to help policymakers imagine possible futures.
- Evaluating the impacts, risks and uncertainties involved in different scenarios over time.
- Testing changes to regulatory structures in a safe, simulated environment, allowing new ideas to mature iteratively and at pace.
- Identifying key challenges, conflicts, and gaps in the regulatory framework.

### **Conclusion**

The use of 'serious gaming' policy development demonstrates how participatory, design-led approaches can bring together diverse stakeholders with differing objectives to test policy decisions and explore future outcomes in a safe, simulated environment. This work also highlights the value of design beyond the traditional design domain (Verganti, 2009; Brown & Katz, 2011; Bason, 2018), and notably marks human-centred design as an important topic to be considered by both policymakers and designers in their future work.

### **References**

Bason, C. (Ed.). (2018). *Leading Public Sector Innovation: Co-creating for a Better Society* (2<sup>nd</sup> ed.). Bristol: Policy Press.

- Boyer, B., Cook, J. W., & Steinberg, M. (2011). *In Studio: Recipes for Systemic Change*. Sitra.
- Brown, T., & Katz, B. (2011). Change by Design. *Journal of Product Innovation Management*, 28(3), 381-383. <https://doi.org/https://doi.org/10.1111/j.1540-5885.2011.00806.x>
- Department for Transport. (2019). *Maritime 2050: Navigating the Future*. Retrieved from <https://www.gov.uk/government/publications/maritime-2050-navigating-the-future>
- Kimbell, L. and Macdonald. H. (2015). *Applying Design Approaches to Policy Making: Discovering Policy Lab*. Brighton: University of Brighton.
- Maritime and Coastguard Agency. (2020). *Maritime Autonomy Regulation Lab (MARLab) Report*. Retrieved from <https://www.gov.uk/government/publications/maritime-autonomy-regulation-lab-marlab-report/maritime-autonomy-regulation-lab-marlab-report#executive-summary>
- Micheli, P., Wilner, S. J. S., Bhatti, S. H., Mura, M., & Beverland, M. B. (2019). Doing Design Thinking: Conceptual Review, Synthesis, and Research Agenda. *Journal of Product Innovation Management*, 36(2), 124-148. <https://doi.org/10.1111/jpim.12466>
- Pomeroy, R. V., & Earthy, J. V. (2017). Merchant shipping's reliance on learning from incidents – A habit that needs to change for a challenging future. *Safety Science*, 99, 45-57. <https://doi.org/10.1016/j.ssci.2017.01.014>
- Sabherwal, S., Cutler, N., & McMurtry, S. (2024). Introducing RegBox: Using serious games in regulatory development. *PolicyLab Blog*. <https://openpolicy.blog.gov.uk/2024/01/25/introducing-regbox-using-serious-games-in-regulatory-development/>
- Sanders, E. B. N., & Stappers, P. J. (2008). Co-creation and the new landscapes of design. *CoDesign*, 4(1), 5-18. <https://doi.org/10.1080/15710880701875068>
- Verganti, R. (2009). *Design Driven Innovation: Changing the Rules of Competition by Radically Innovating What Things Mean*. Harvard Business Review Press.