

# **Digital Transformation of Mediterranean Ports: Impact on Sustainable Performance Through the Perspective of the TOE Framework and Sustainable Innovation Capabilities**

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## **Abstract**

This article aims to study the impact of digital transformation on the three dimensions of sustainable performance in Mediterranean ports, by integrating the TOE model (Technology, Organization, Environment), and the theory of sustainable innovation capabilities. The theoretical model used in this study is derived from the literature, while including the environmental, economic, and social dimensions of sustainable performance. A quantitative approach was adopted to examine the direct effect of digital transformation on environmental, economic, and social performance, as well as its indirect effect through sustainable innovation capability. The analysis of these effects was carried out using SmartPLS 4.1.0.9 software, based on 425 observations collected through a questionnaire distributed to employees of 78 Mediterranean ports. The results reveal that environmental and organizational factors exert a positive impact on the digital transformation of Mediterranean ports, leading to an optimization of environmental, economic, and social performance. The indirect effect linking digital transformation to the dimensions of sustainable performance, through the mediating variable of sustainable innovation capability, is significant. However, this effect has a positive impact on environmental and social performance, while having a negative impact on economic performance. These findings provide Mediterranean port managers with concrete levers to optimize their digital strategies and strengthen their ecological transition, particularly through increased investment in technological factors and sustainable innovation, while ensuring a balance between the three dimensions of sustainability.

**Key words:** Digital Transformation; TOE Framework; Sustainable Performance; Sustainable Innovation Capability