

Exploring the use of Digital Twins to mitigate the environmental risks of offshore wind farms through stakeholder consultations in Nova Scotia

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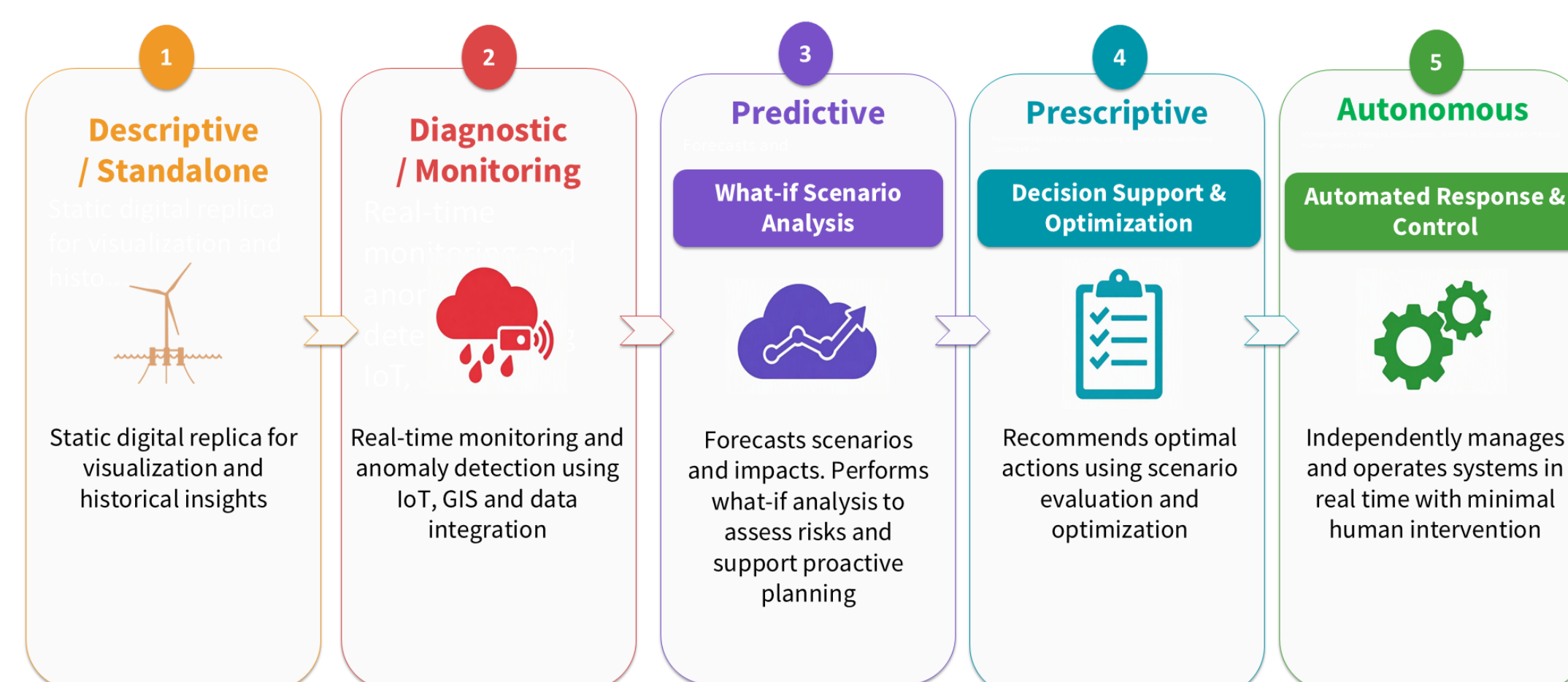


We gained an understanding of the value of DTs for the environmental management of OWF impacts

INTRODUCTION

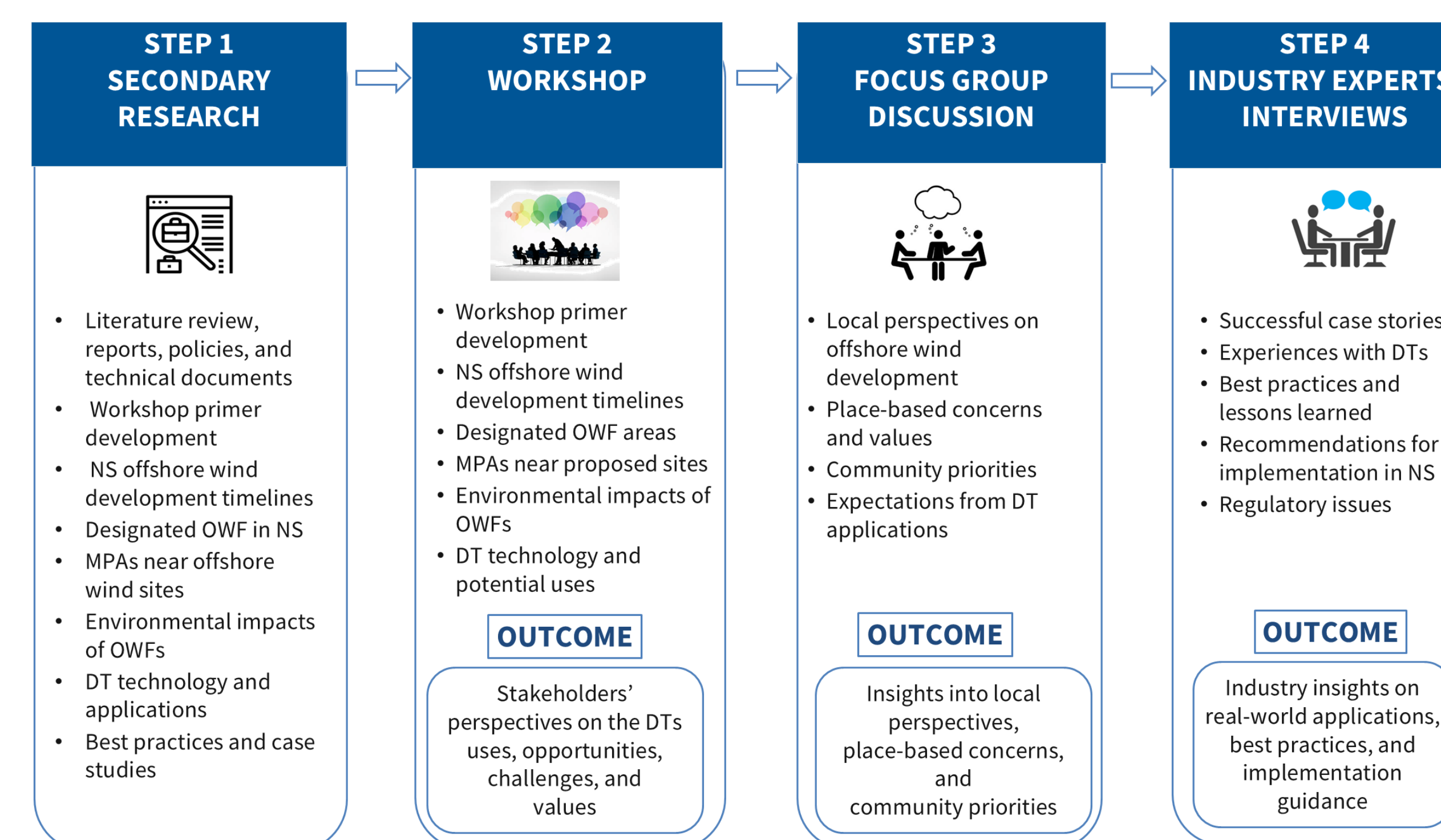
Nova Scotia (NS) is expanding Offshore Wind Farm (OWF) development to support renewable energy, but this growth may affect sensitive marine ecosystems, especially in relation to Marine Protected Areas (MPAs). Balancing energy production with conservation priorities requires transparent, evidence-based tools. Digital Twin (DT) technology offers a promising approach by integrating real-time data with environmental and operational models to improve monitoring and forecasting. Although DTs exist for OWF performance and ocean dynamics, combined use for environmental management remains underexplored. This project explores the feasibility and value of an integrated DT to strengthen environmental management and support responsible offshore wind development in NS.

Digital Twin Development Levels Evolving from Representation to Autonomy



METHODOLOGY

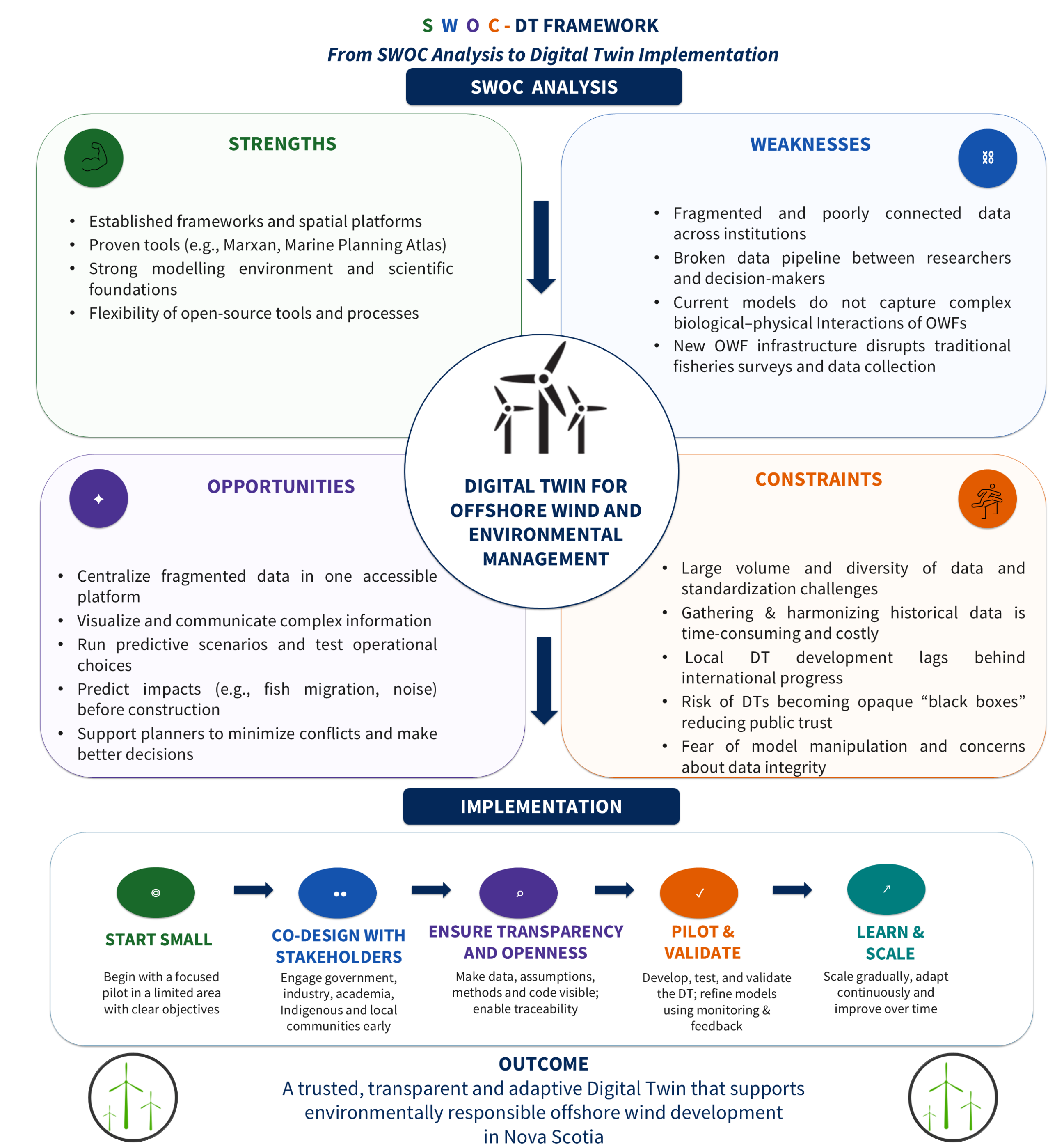
Our study combined secondary research, a stakeholder workshop, and focus group discussions involving government officials, academicians, researchers, and NGOs in Halifax and Cape Breton, respectively. We also conducted virtual interviews with industry experts. These activities provided diverse perspectives, place-based insights, and practical guidance for advancing DT applications in offshore wind development.



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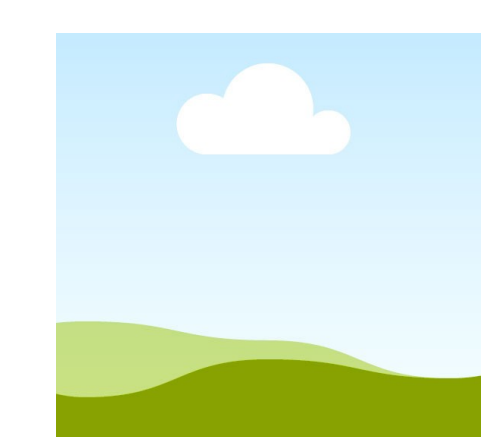
RESULTS



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