



Exploring NOAA's Role in enhancing Technology & Resilience

September 02, 2021

HYDROGRAPHIC SERVICES REVIEW PANEL



noaa



Potential Opportunities

Improving the operational capability and competitiveness of U.S. Ports and supply chain by providing leadership in:

HYDROGRAPHIC SERVICES REVIEW PANEL





- ❖ **Precision** Navigation - reliability & resilience
- ❖ Navigation in **Restricted visibility** – Safety & economic impact
- ❖ Enhancing **real-time sensors** for Wind, current, Airgap, Fog, wave height, etc. in congested waterways
- ❖ **Cyber resilience** in existing platforms, PORTS, AIS, etc.
- ❖ **Digital Twin** for a port & its operation – Resilience study
- ❖ Fostering **Offshore wind** development



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What is Digital Twin?

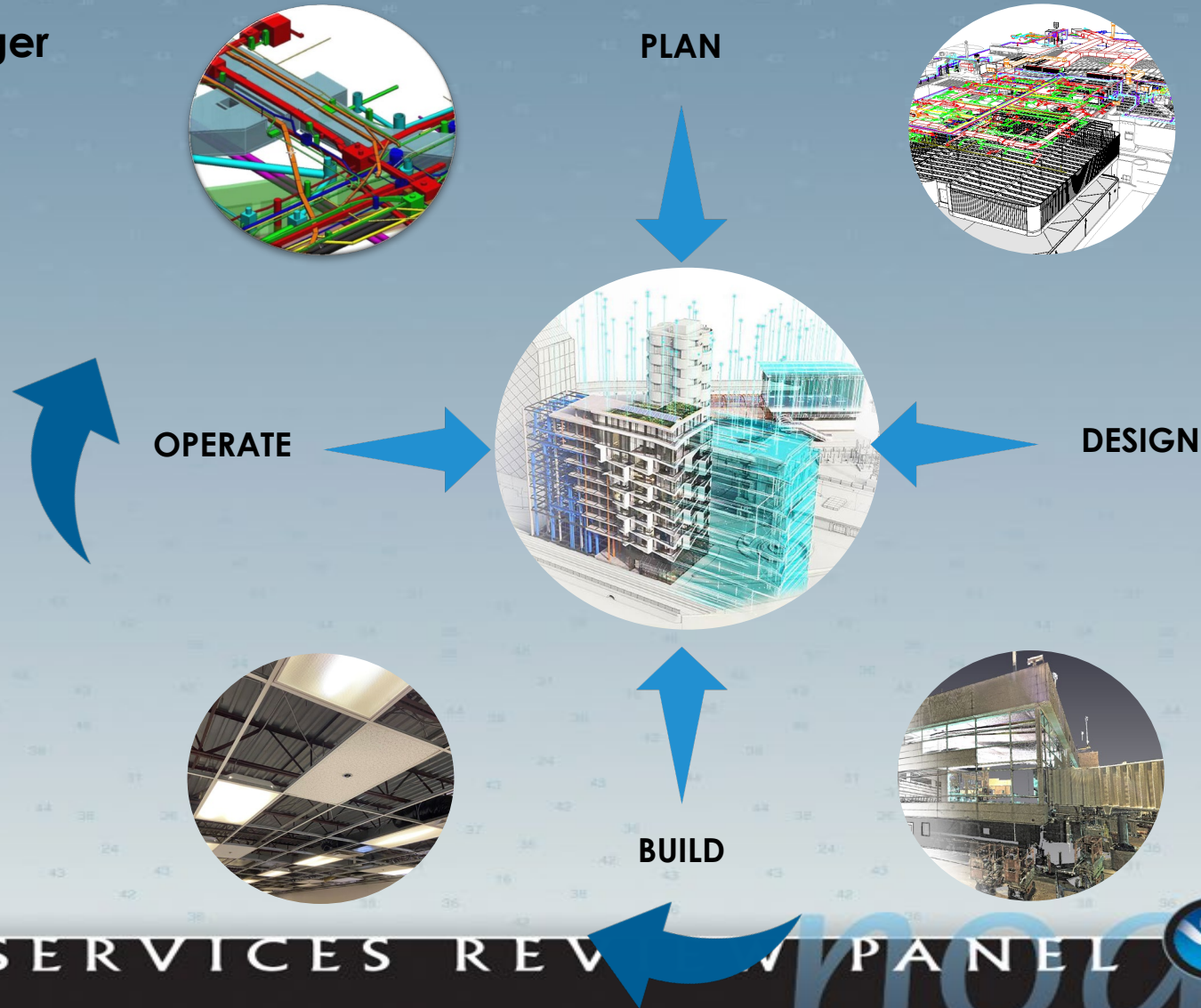
A Digital Twin (DT) is:

- A dynamic, up-to-date replica or representation of a physical object, an asset, or system
- With a complete collection of all data (including real-time data) in one place
- A digital twin evolves with the flow of real-time input from IOT sensors and more
- It is NOT a static 3D model or simulation; DT continues to evolve with added data and information. It is a real-time duplicate.
- Connection between the digital and physical worlds offers enhanced lifecycles, informed decision-making, past incident learnings and predictive capabilities.

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Benefits of Digital Twin for Assets Manager

- ❖ Accelerates asset operational readiness
- ❖ Transform an asset's life cycle with the use of maintenance and performance data
- ❖ Asset owner want digital data at handover, project designs and models do not end up trapped in files (i.e., pdf, spreadsheets, etc.), it lives in dynamic objects that is easy to manage and access
- ❖ Without DT approach, analog, unclassified, and disconnected data presents challenges for owners and managers to manage their asset.
- ❖ Connection between the digital and physical worlds offers enhanced lifecycles, informed decision-making, and predictive capabilities





Digital Twins in Sea Ports & Harbors

A dynamic, up-to-date replica of a physical asset(s) of the port and the navigation channels that brings together design, construction, and real-time operational data.

Digital twins simulate, predict, and inform decisions during daily operations, navigation, or rapid response.

