IS FUTURE *SMART* PORT A FACTORY?

Opportunities for Replicating Industry 4.0 in Port / Terminal Operations

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Maritime industry is different, but not that much

Factory of the Future 4.0	Logistics of the Future 4.0
• Fully digital, seamlessly networked value chain with no/minimal human intervention	• Fully digital, seamlessly networked value chain with minimal/no human intervention
• Machine before the human (Considers, Decides, Executes)	• Machine before the human (Considers, Decides, Executes)
• Lean, leaner, leanest (machines find leaner ways of working by themselves)	• Lean, leaner, leanest (machines find leaner ways of working by themselves)
• Continuous flow	• Continuous flow
• Single piece versus batch	• Every vessel call is custom-orchestrated
• Systems thinking	• Systems thinking (port + terminal + land)
• Automated optimisation of bottlenecks	• Automated optimisation of bottlenecks
• Systematic defect reduction	• Systematic defect reduction

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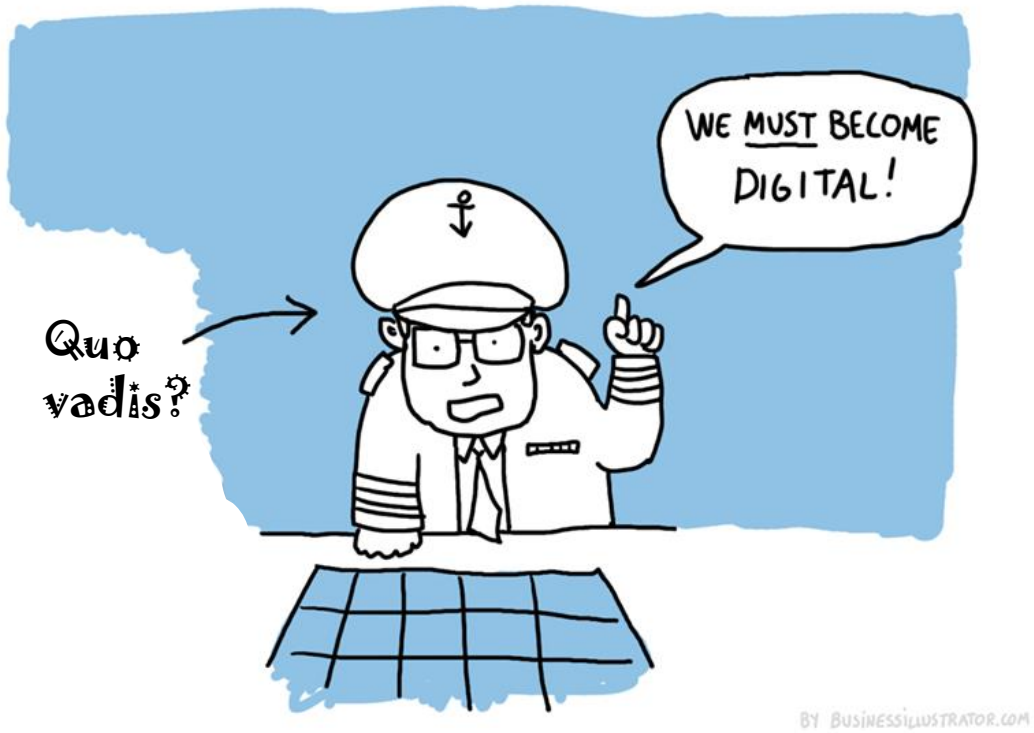
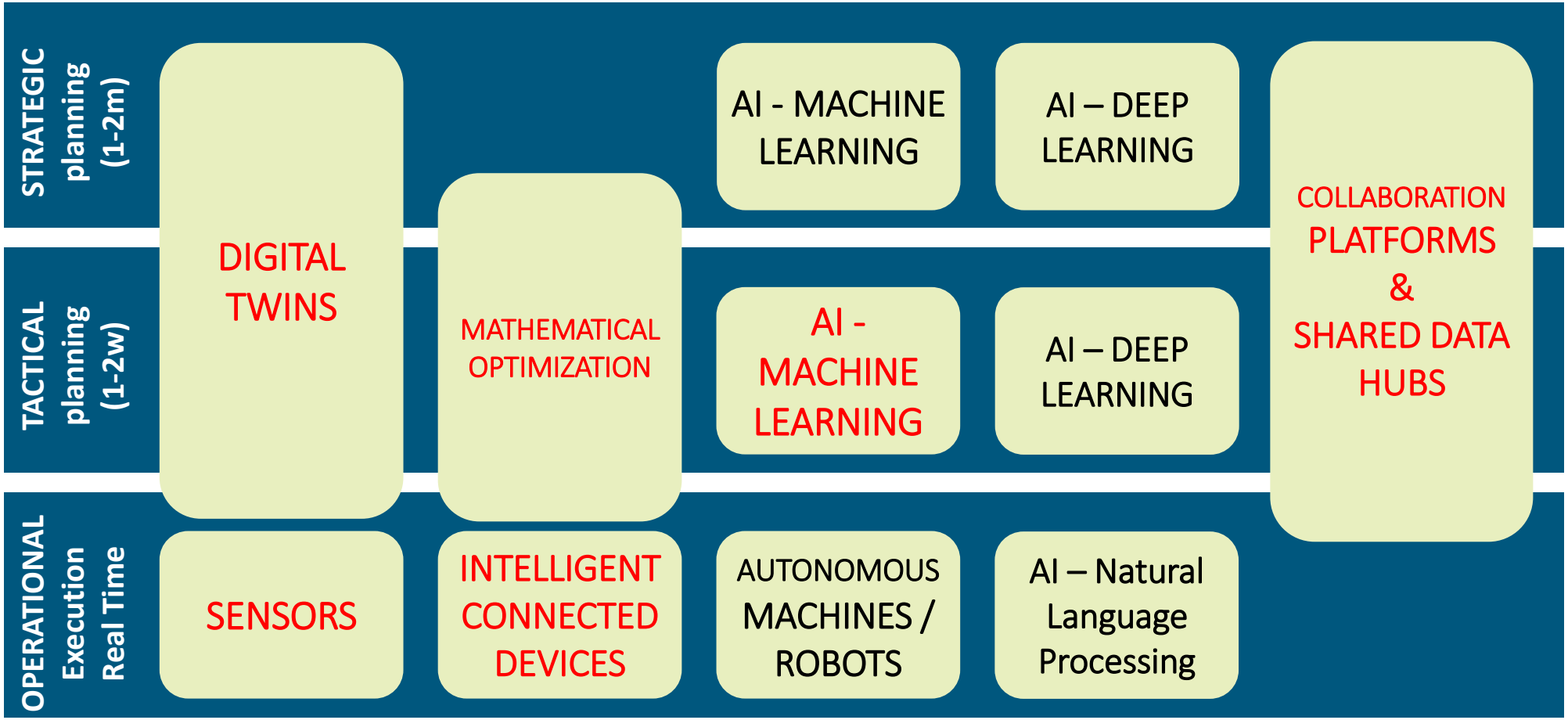
THE QUEST FOR

FUTURE PORT



Virpi Oinonen. Image sighted at: www.businessillustrator.com

What are the Digital Ingredients of Logistics 4.0?



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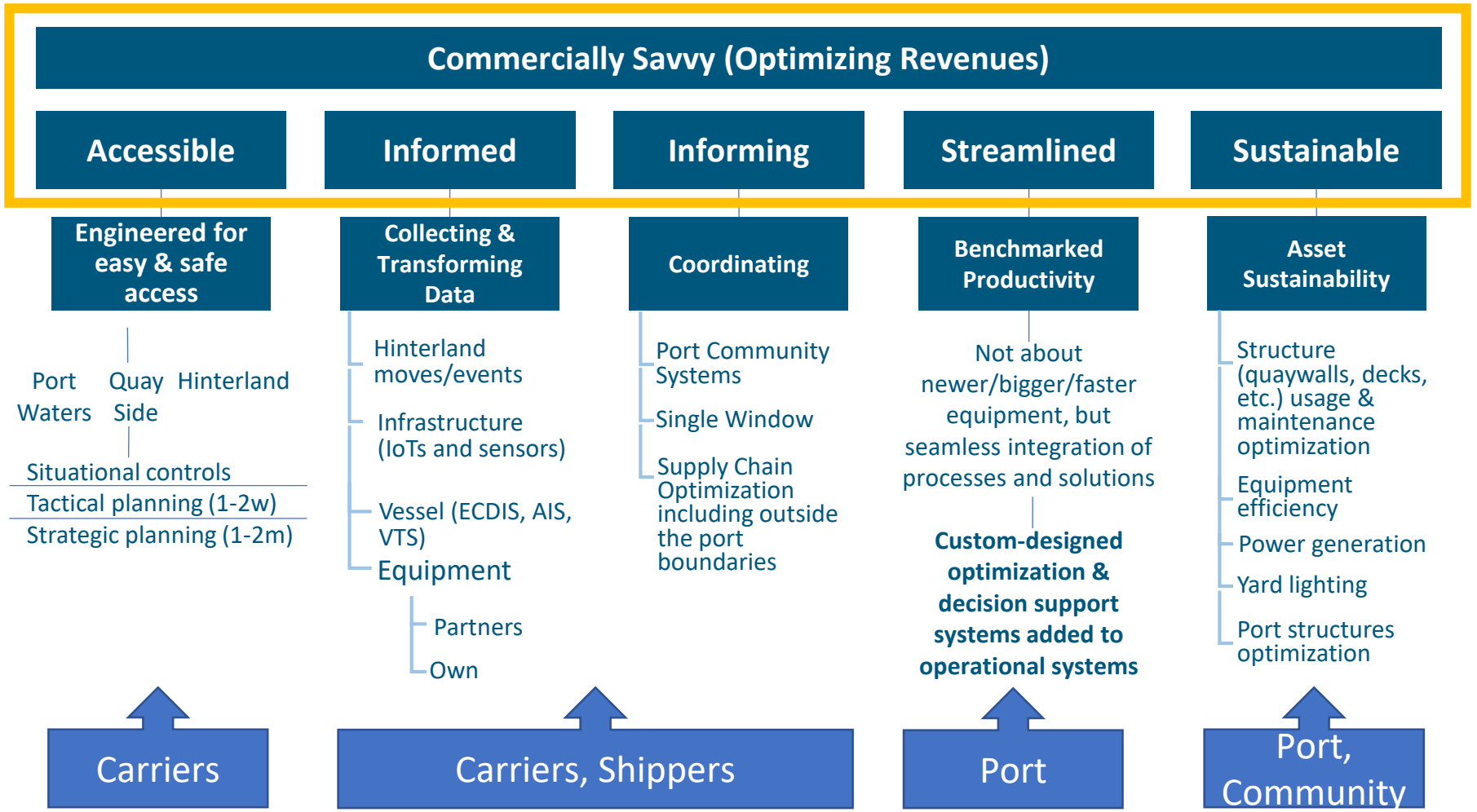
Where to Apply 4.0 Concepts in the Port?



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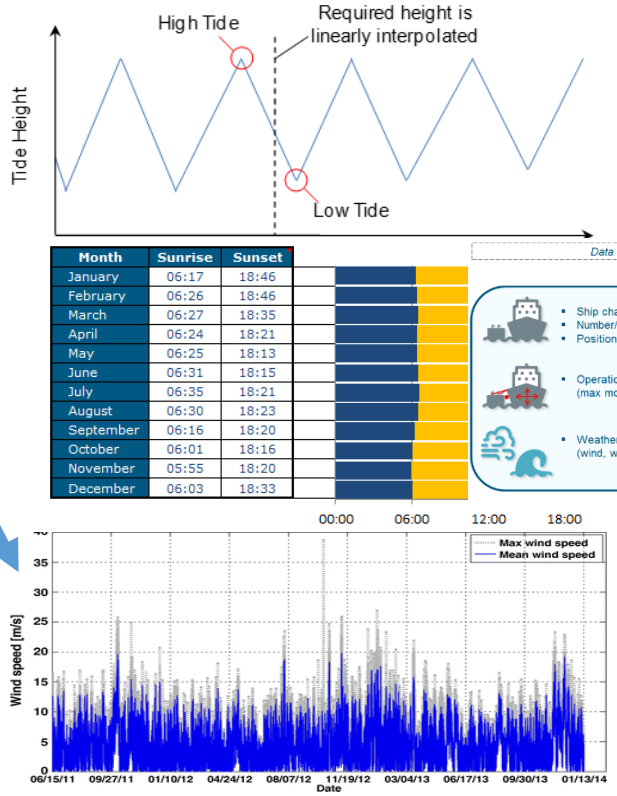
Systems thinking! Think process, not activity!

COMPLEX SENSOR Automation	AND	MACHINE LEARNING Software	REAL TIME DECISION Software	BERTH PLAN OPTIMIZATION Software	AND	INTELLIGENT EQUIPMENT Automation

WIND + WAVES

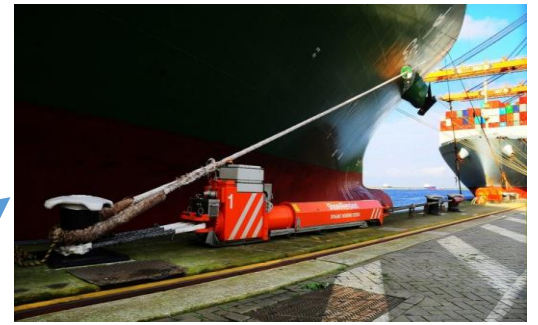
Datawell BV



Can I accept this ship?
When it's safe to moor this ship?
Where it's safe to moor this ship?

When to close / re-open the port to ships?

ShoreTension BV



Cavotec

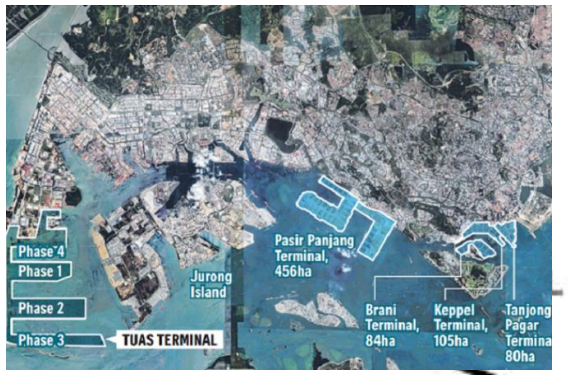
Business as usual
Tanjong Pagar

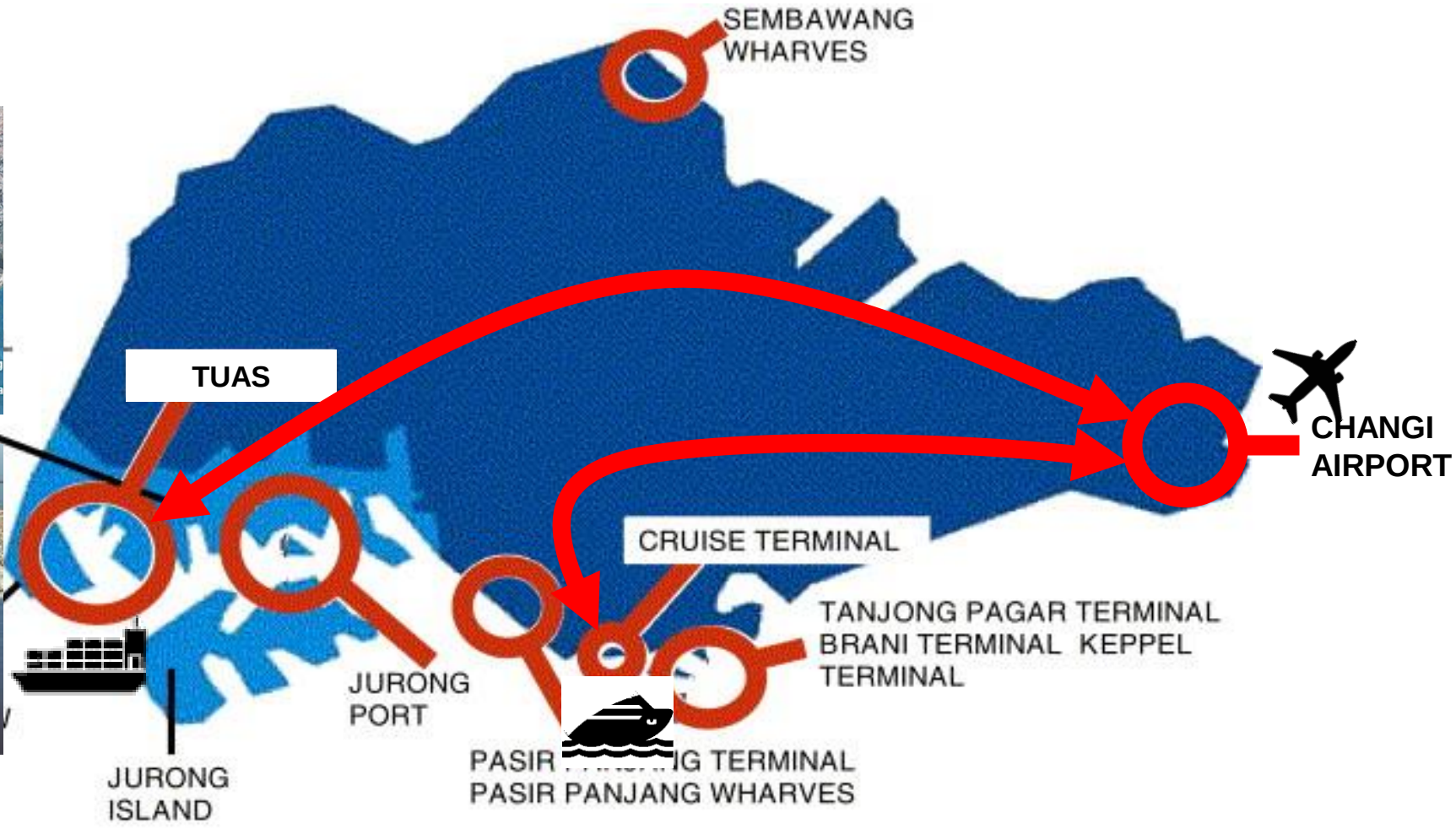
DIGITAL TWIN
Terminal transport changes -> 3m sea rise

COMPLEX SENSOR		AI – DEEP LEARNING	AUTONOMOUS EQUIPMENT
Automation	AND	Software	SW+Automation

- **Master planning beyond civil engineering problem** – poor value out of typical Port Master Plan deliverables when it comes to technology strategy and tactics
- **Next generation of twins are here** – connected to sensors in real time; classifying new data; running operational scenarios by themselves; autonomously assessing value of changes; capable of changing operational procedures and adjusting behavior of autonomous equipment

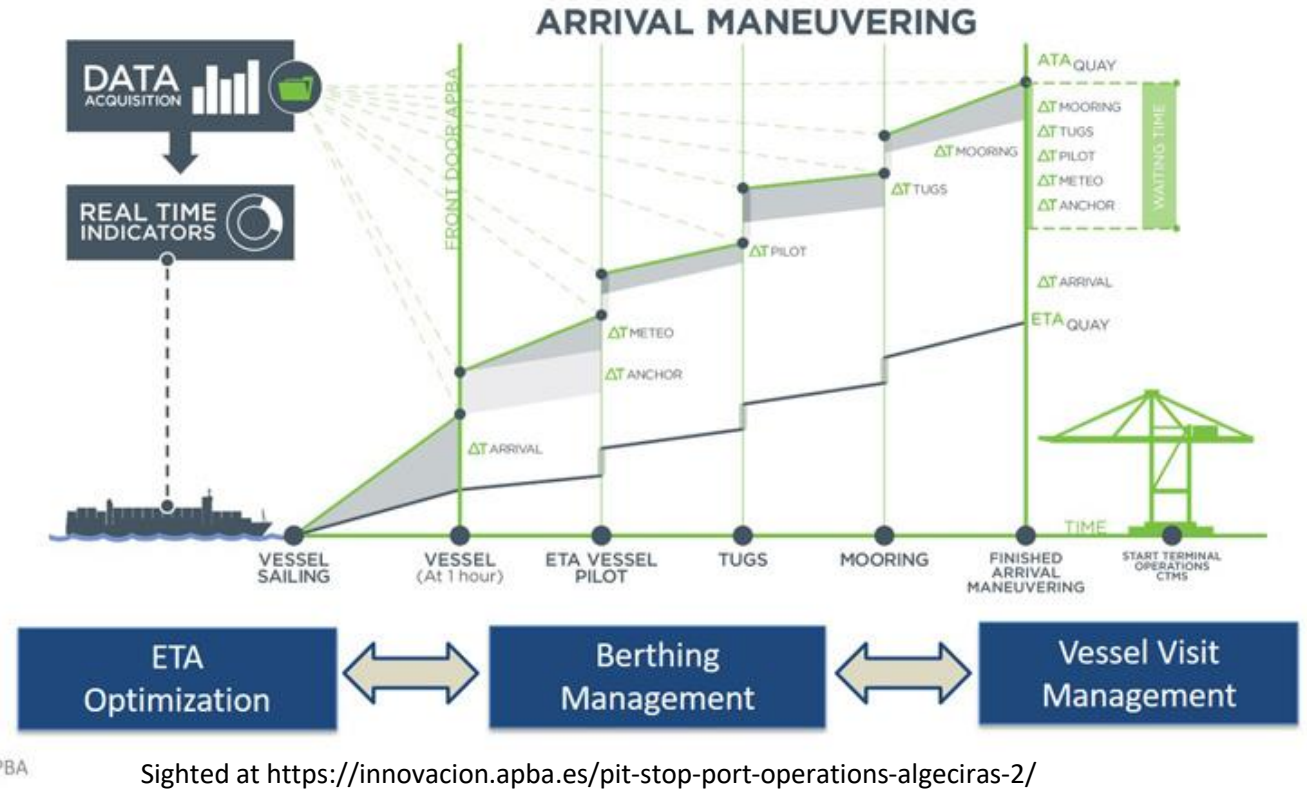
“Ex Port” *Digital Twin* Project – Port + Cruise Port + Airport





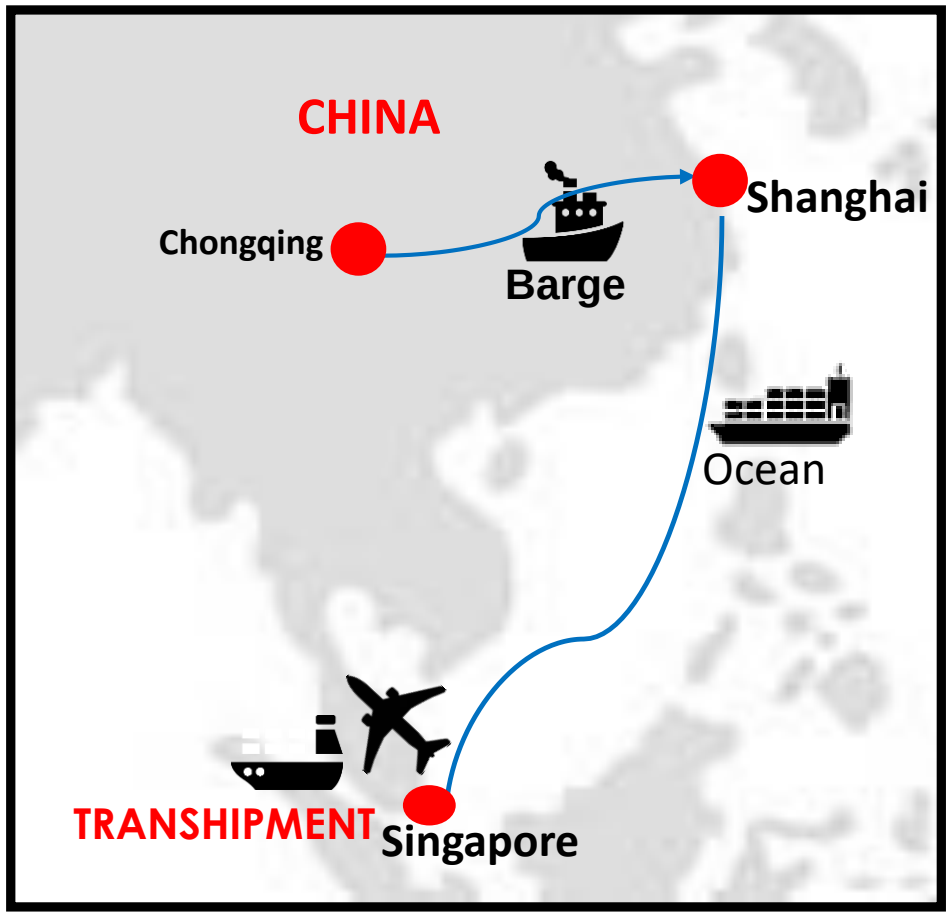
“In Port” Logistics 4.0 – Port + Terminals Ops Synchronization Platform

MACHINE LEARNING	REAL TIME DECISION	BERTH PLAN OPTIMIZATION	AND	TOS INTEGRATION
Software	Software	Software		Automation



Sighted at https://innovacion.apba.es/pit-stop-port-operations-algeciras-2/

New Frontier for Ports – Digital Platforms

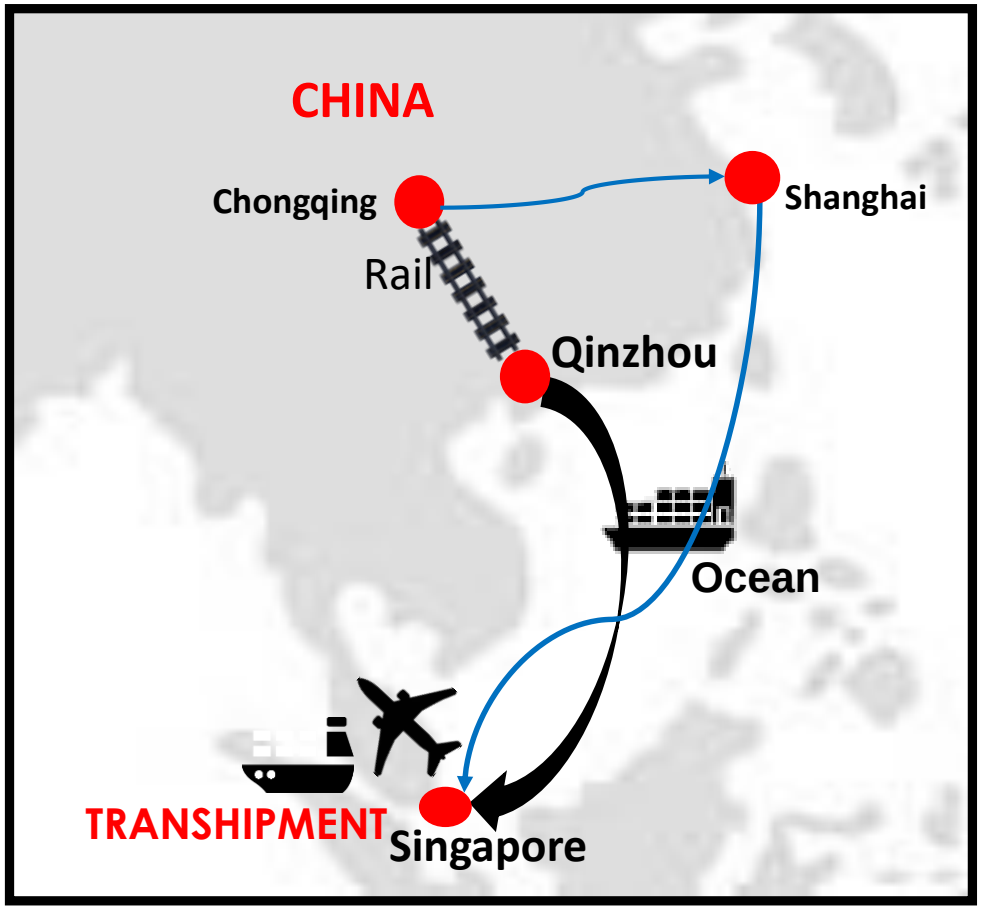


6,400 KM
22 – 25 DAYS

International Land-Sea Trade Corridor

TWO PORT INTEGRATION FOR SMARTER E-COMMERCE

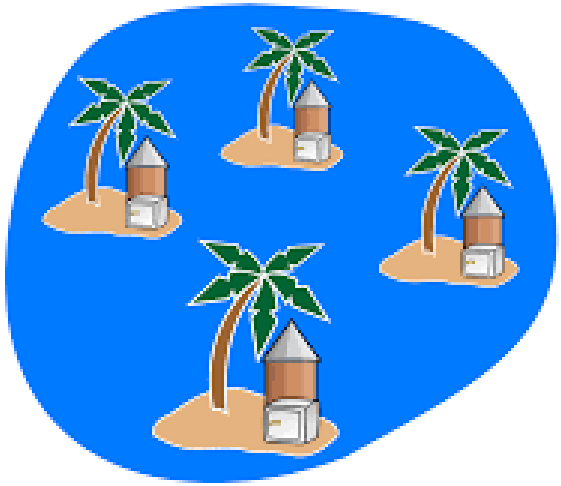
GSBN ?
CALISTA ?
Tradelens ?



3,800 KM
7 - 10 DAYS

Port Community System

https://connected-ports.org



Don’t be an “island”.
Let’s build connected archipelago of ports

PORT OF HELSINKI

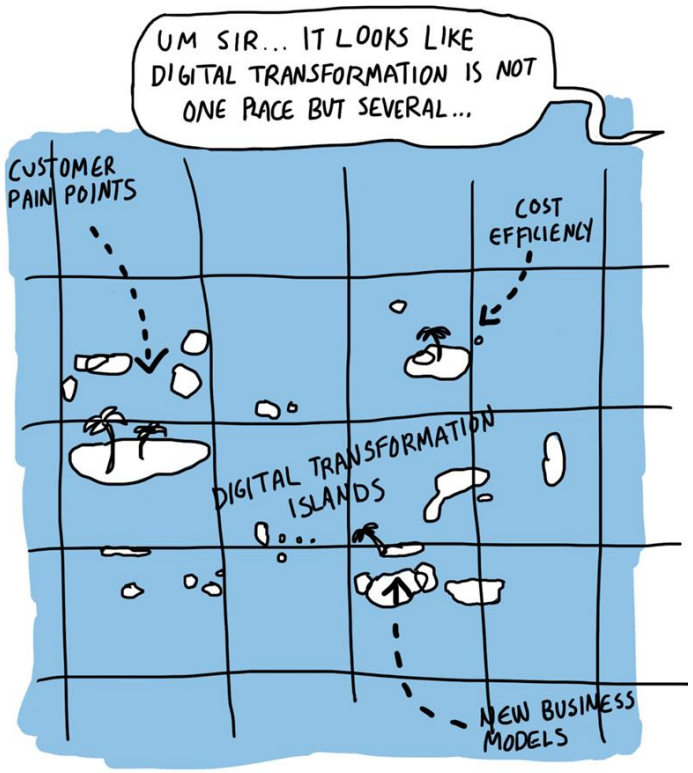
PORT GDAŃSK

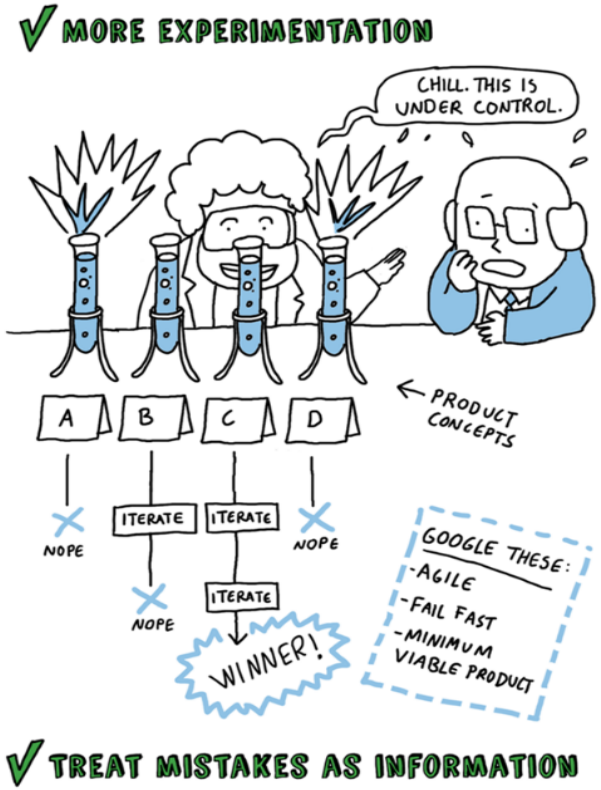
Port of Hamburg

Port of Rotterdam

LA THE PORT OF LOS ANGELES

Logistics 4.0 in Port – 3 Smart Things to Remember





Virpi Oinonen. All images on this page sighted at: www.businessillustrator.com

Thank you

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