

An aerial photograph of a large port terminal, likely Hamburg, showing numerous shipping containers, cranes, and industrial buildings. A semi-transparent network of white lines and glowing blue nodes is overlaid on the image, suggesting a digital or automated infrastructure. The sun is low on the horizon, creating a warm glow.

# Gamechangers in Automation

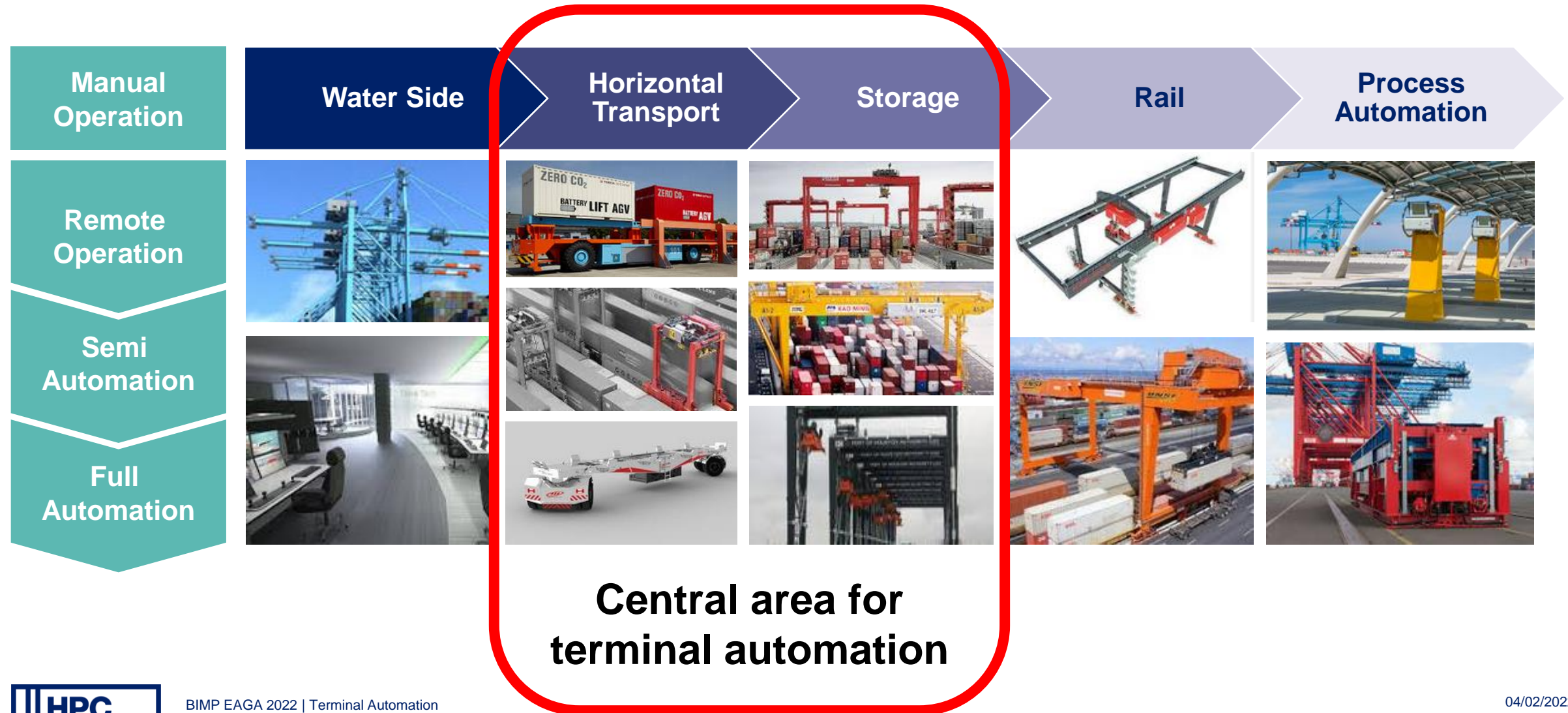
**The impact of autonomous trucks and disruptive concepts on terminal automation**

4 August 2022 | Dr. Nils Kemme, HPC Hamburg Port Consulting



# What is the right level, area and technology for automation?

Types of Automation: Terminal Automation includes various Options and Areas



# Who we are – pioneers in automation

About HPC



1,730

Projects in

133 COUNTRIES



1976

Founded as subsidiary  
of Germany's leading  
port operator

PIONEERING  
TERMINAL  
AUTOMATION

Developed and realized  
the blueprint for  
terminal  
automation  
globally



100  
ENTHUSIASTS



With background  
from port and  
terminal operations  
and software

TERMINAL  
AUTOMATION

Planning &  
Realisation



80+

OPTIMISATION

Improved operational  
excellence and  
reduced costs



180+  
PORTS

And terminals  
planned and  
optimised



1<sup>st</sup> BROWNFIELD CONVERSION

For terminal of relevant size double capacity on given footprint, while  
automating the yard during continuous operations.



Developed *HPC Ukraina* (now HHLA  
CTO) as terminal operator in Odessa

# What we do – consulting the maritime supply chain

## Our Service Portfolio



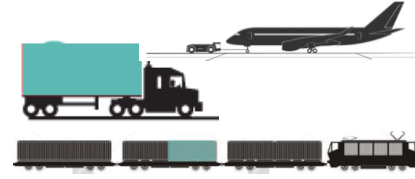
SHIPPING



PORTS



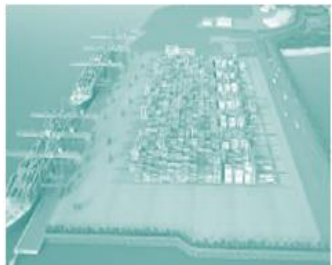
TERMINALS



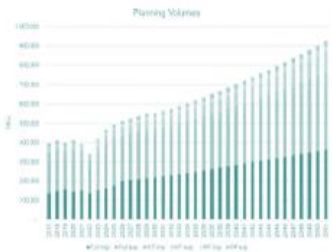
HINTERLAND



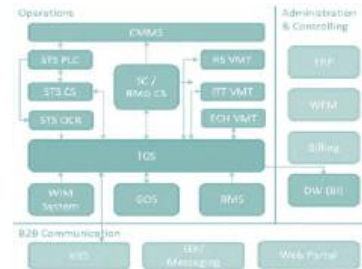
STORAGE



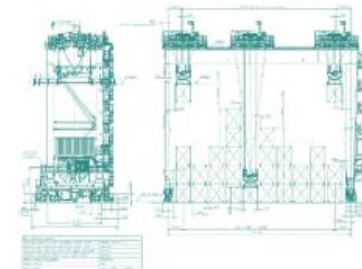
Planning & Simulation  
Optimisation  
Project Delivery



Market Forecast  
Business Plans  
Due Diligence



IT and Innovation Strategies  
TOS Implementation  
IT and automation integration



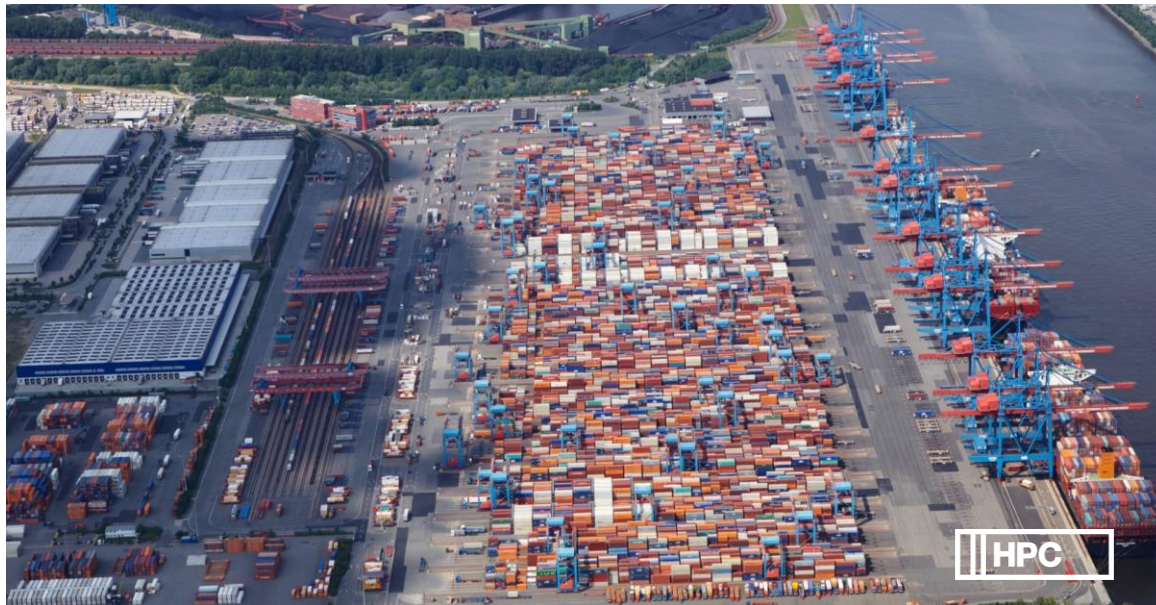
Engineering  
Construction Supervision  
Procurement Assistance



# Automation as we know it

In most traditional full automated terminals yard cranes perform horizontal transport to maintain separation

## The standard setup – 20+ years and counting



- Perpendicular yard setup enabling automated horizontal transport
- Transshipment terminal often with Cantilever ASC
- Significant efforts to make the interfaces work and return productive operations

## VICT, Melbourne



- Planned ad designed with added levels of automation
- Following the same separation concept
- Evolution of technology

# Key automation gamechangers and their impact

## Autonomous trucks



1. No traffic area separation
2. Realignment of terminal components
3. Compact layout
4. Retrofit of established terminals becomes easier

## Digital solutions



1. Process automation
2. AI-supported decision making
3. Integration beyond terminal boundaries

## Vertical Yard



1. Densification
2. Horizontal transport and external traffic integration
3. Applicable regulations

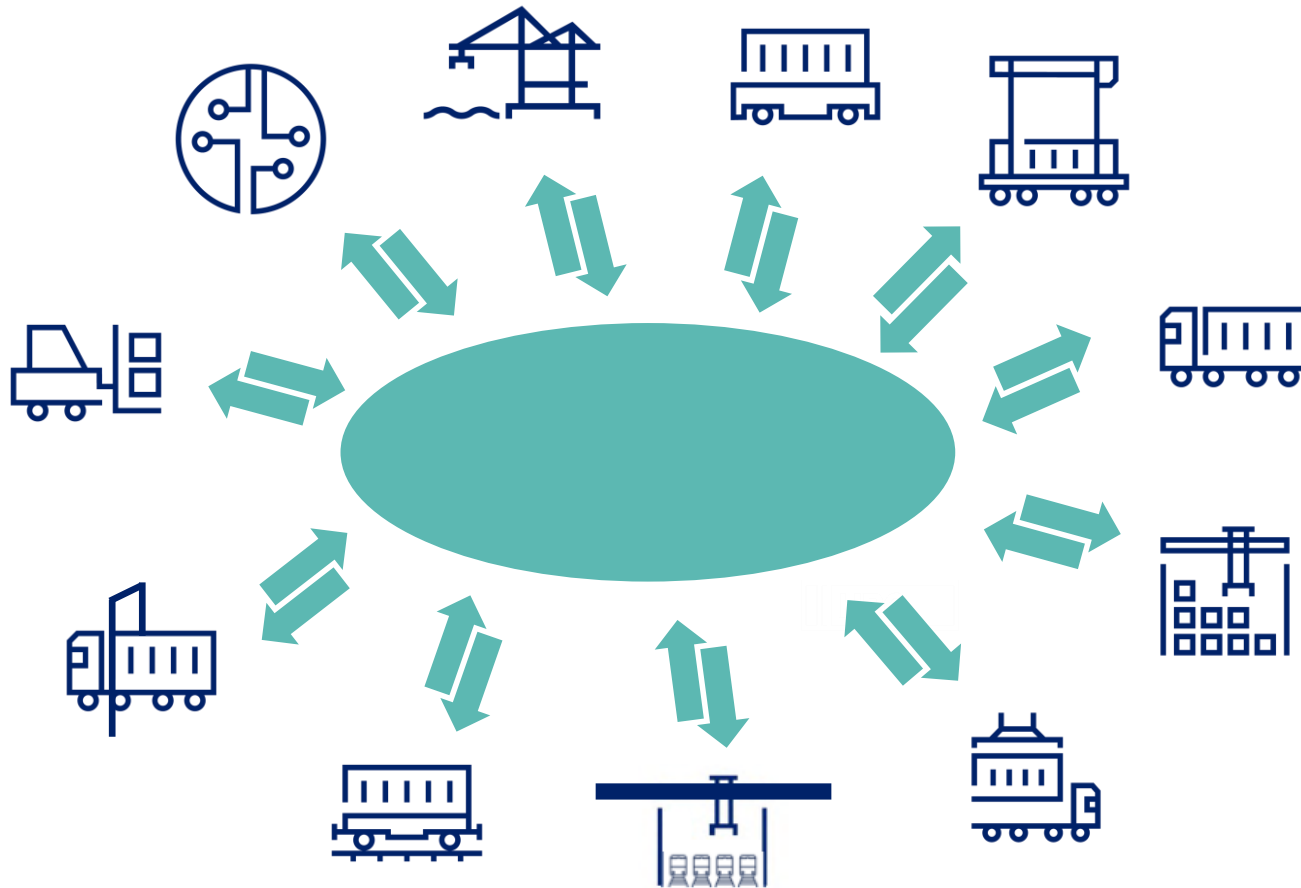


# Design implications – we are likely to go parallel again

Automation opportunities to be re-assessed for those who put them off previously



# API standards and strategies must allow modularity and future additions



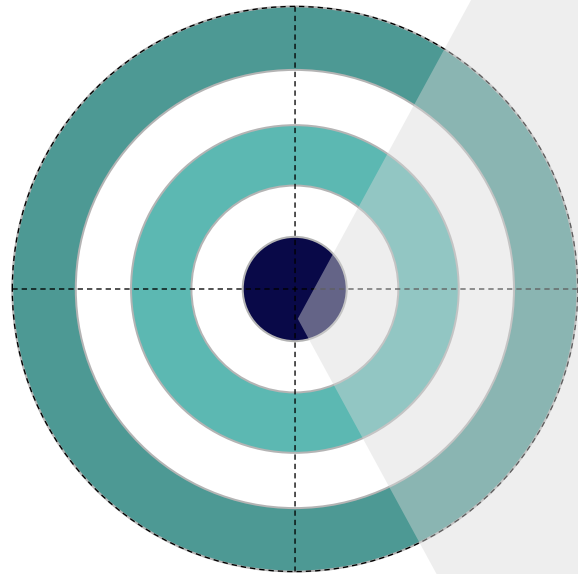
**Enabling new technologies and systems**

**Modular automation opportunities**

**Open API strategy is required**



# Key takeaways



- 1 Automation solution change**  
Parallel yard layout becomes applicable for full automation
- 2 Automation can become viable for terminals that have discarded it**  
Brownfield automation becomes a lot easier for a range of terminal
- 3 Testing, integration and implementation approaches remain valid**  
Detailed planning and testing of components and staff training remain critical
- 4 Open API strategy will drive automation modularity**  
Enabling standardised automation implementation decreases implementation risks





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