Applied Port Integration – 'Digitalization, Automation and Interconnectivity'

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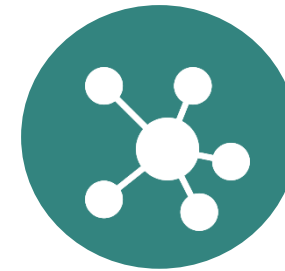
AUTOMATION SYSTEMATIC FRAMEWORK

Processes

Systems

Data

Workforce

1 The introduction of Automation involves changes to our Industry, which need to be incorporated into Terminals business model.
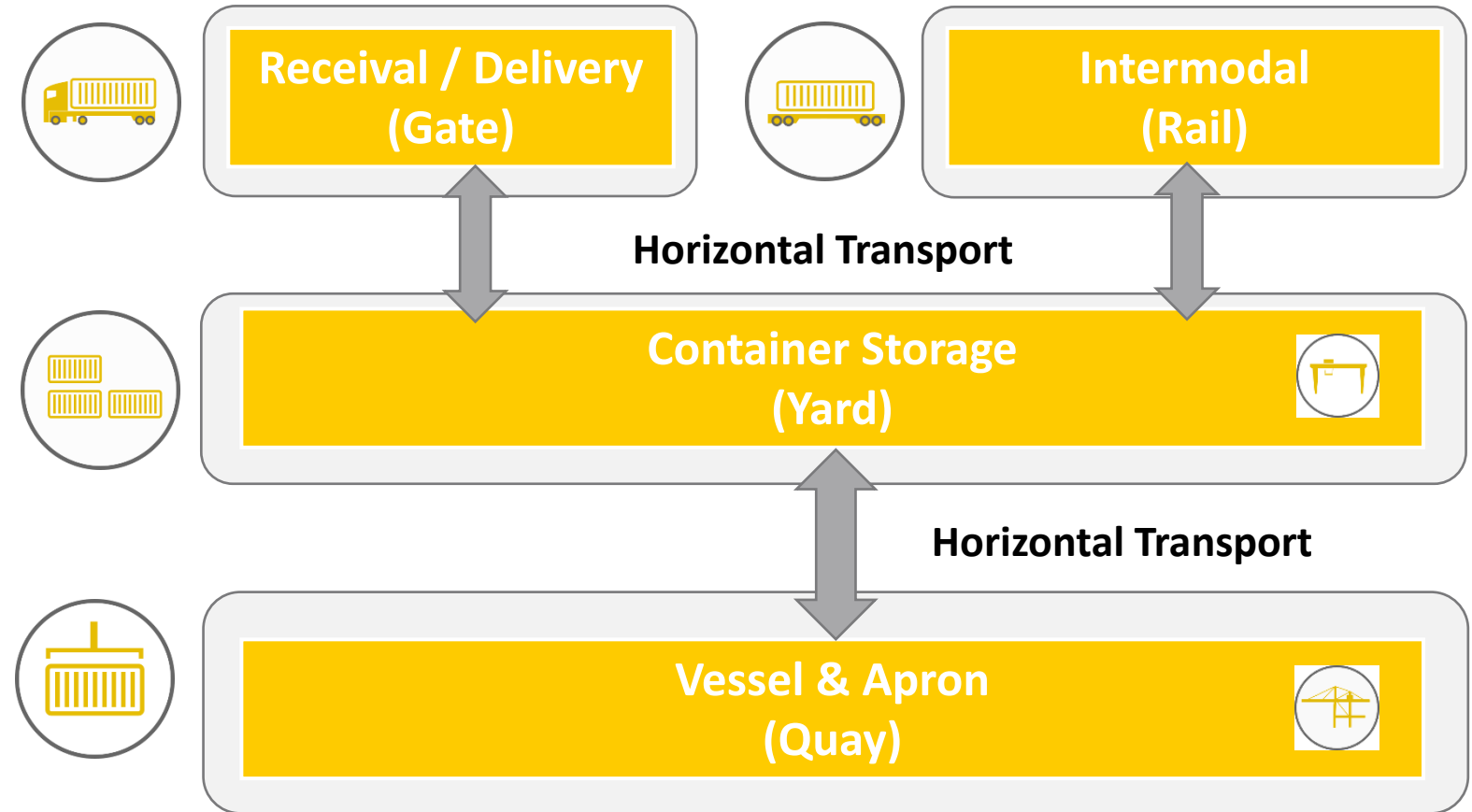
2 Digitalization involves transforming the business transactions to a single process platform to act as the operational backbone.

3 Beyond Efficiency, strong drivers are on realizing new standards to improve Sustainability, Safety and Security at Terminals.
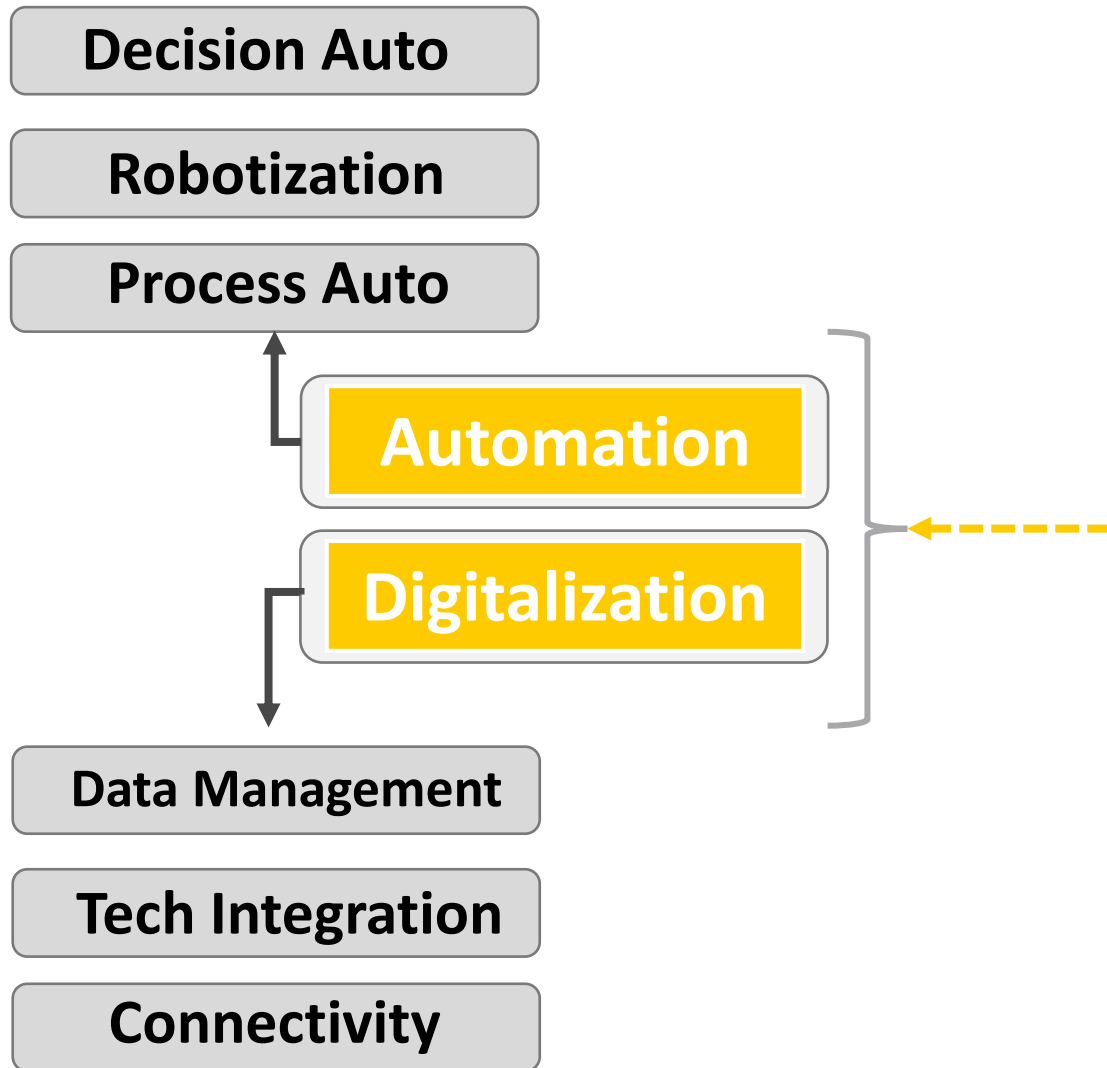
TERMINAL ENGINEERING 'BUILDING BLOCKS'

By engineering the Terminal as a 'system' of integrated modules the methodology allows:

- Simpler design of the requirements and specs for each module,
- Flexibility to evaluate different options for each of the modules,
- Upfront identification of integration and localization requirements.

Receival / Delivery (Gate)

Intermodal (Rail)

Horizontal Transport

Container Storage (Yard)

Horizontal Transport

Vessel & Apron (Quay)

DIGITALIZATION AS AUTOMATION PRE-REQUISITE

TiL

Decision Auto

Robotization

Process Auto

Automation

Digitalization

Data Management

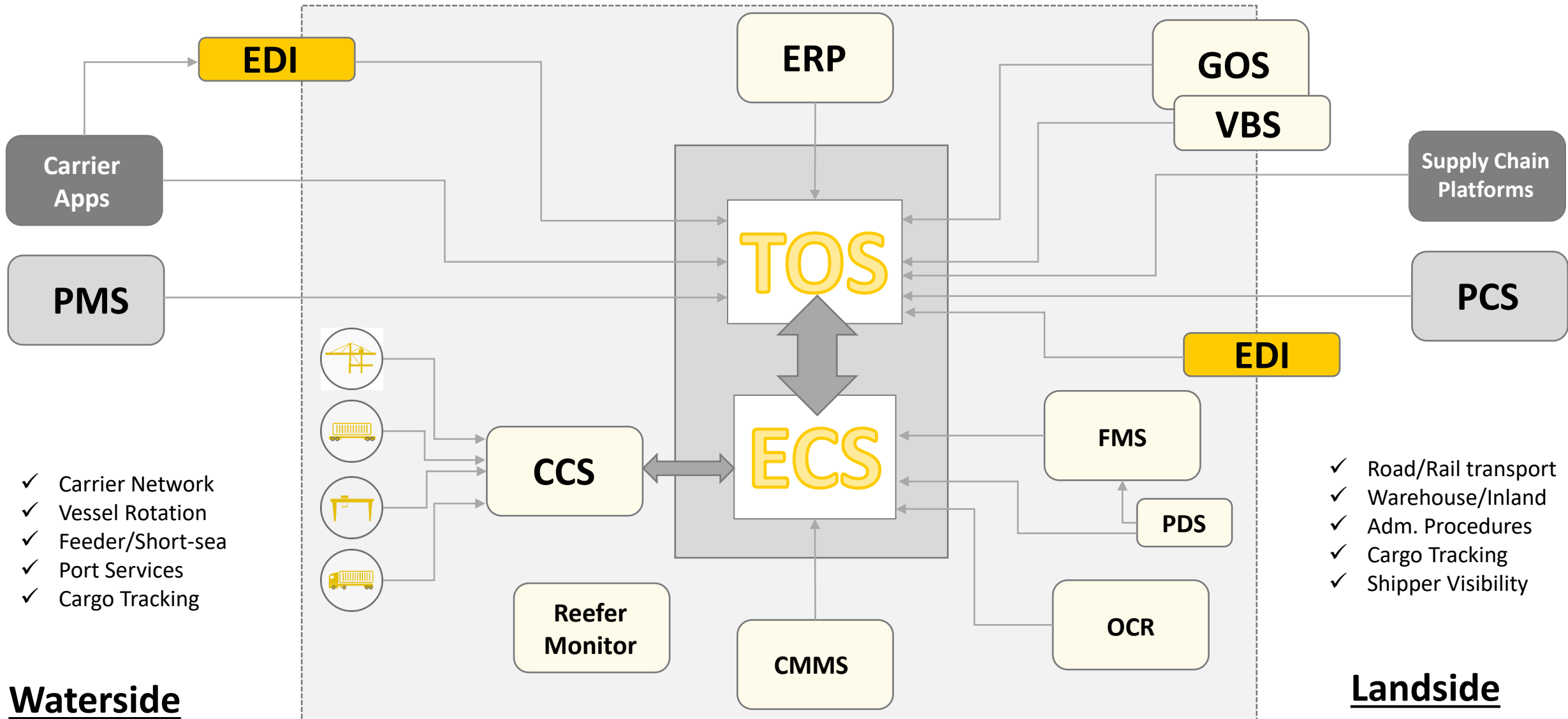| Tech Integration |
|---|

Connectivity

Digitalization establishes a core foundation for effective Automation:

- Data Models and Data Semantics, jointly aligned with Suppliers,
- Interfaces & interactions between different software applications and sub-modules (also to Port eco-system),
- Connection with process and functional features and data 'usage' to enable:
  - Optimization,
  - User Experience,
  - Data Analytics,
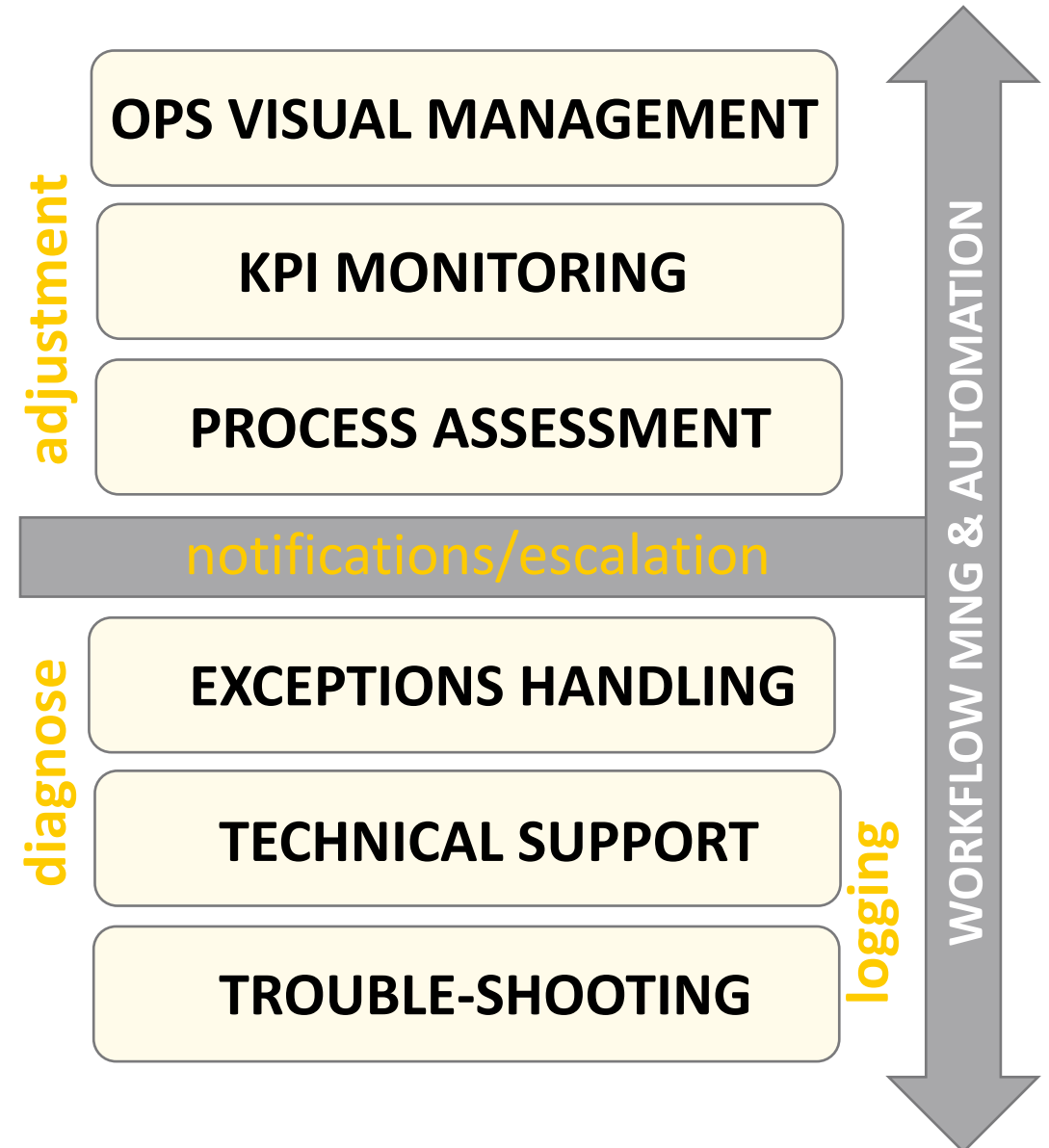 - Artificial Intelligence.

4

TERMINAL ECO-SYSTEM AND INTERCONNECTIVITY

Waterside
- ✓ Carrier Network
- ✓ Vessel Rotation
- ✓ Feeder/Short-sea
- ✓ Port Services
- ✓ Cargo Tracking

Landside
- ✓ Road/Rail transport
- ✓ Warehouse/Inland
- ✓ Adm. Procedures
- ✓ Cargo Tracking
- ✓ Shipper Visibility

Sensitivity: Internal

AUTOMATION AND FUTURE WORKFORCE

It is crucial to think how to enable future generation of workers while we learn from existing knowledge and we manage change:

- The more Container Shipping will go on technology the more reliant will be in human brain but adaptation is required,
- As we will get to have systems and algorithms that will understand us better than we understand ourselves,
- So the evolution of certain paradigms, the transformation of stakeholders relationship and workforce frameworks is key (and urgent).

adjustment

> OPS VISUAL MANAGEMENT

> KPI MONITORING

> PROCESS ASSESSMENT

notifications/escalation

diagnose

> EXCEPTIONS HANDLING

> TECHNICAL SUPPORT

> TROUBLE-SHOOTING

WORKFLOW MNG & AUTOMATION

logging

CONCLUSIONS AND TAKE-AWAYS

- While clearly is the Future for Terminals, Automation can only be properly implemented on a platform of **Operational Excellence**,

- It requires transforming the business silos to a single **digitized process platform** to act as the operational backbone,

- Terminal implementation requires a much more **integrated and cross-functional approach** to seamlessly deploy the different engineering streams,

- An **integrated operational and technical capability** is necessary and still there are serious challenges for finding **standardized solutions**,

- Next wave of Terminals will implement Digitalization and Automation hand-in-hand to truly **connect processes, tools, data and workforce**.

Terminal Investment Limited