This Communication is part of a project that has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°957258

IOTWeek

Dublin —— June 20-23, 2022

ASSIST-IoT Port Automation Pilot

Eduardo Garro (Prodevelop – R&D Project Manager)

GLOBAL VISION:

IoT TODAY AND BEYOND

IOTForum

Prodevelop at a glance

SME company

> 25 years of expertise

More than 100 employees (incl. engineers, finance, etc.)

HQs located in Valencia (Spain)

Technological solutions for the maritime domain

Clients in Spain, UK, Africa and South America

Big data, AI/ML, Edge computing, CDM, JIT Port calls, etc.

Working in several R&D projects

interiot

PIXEL

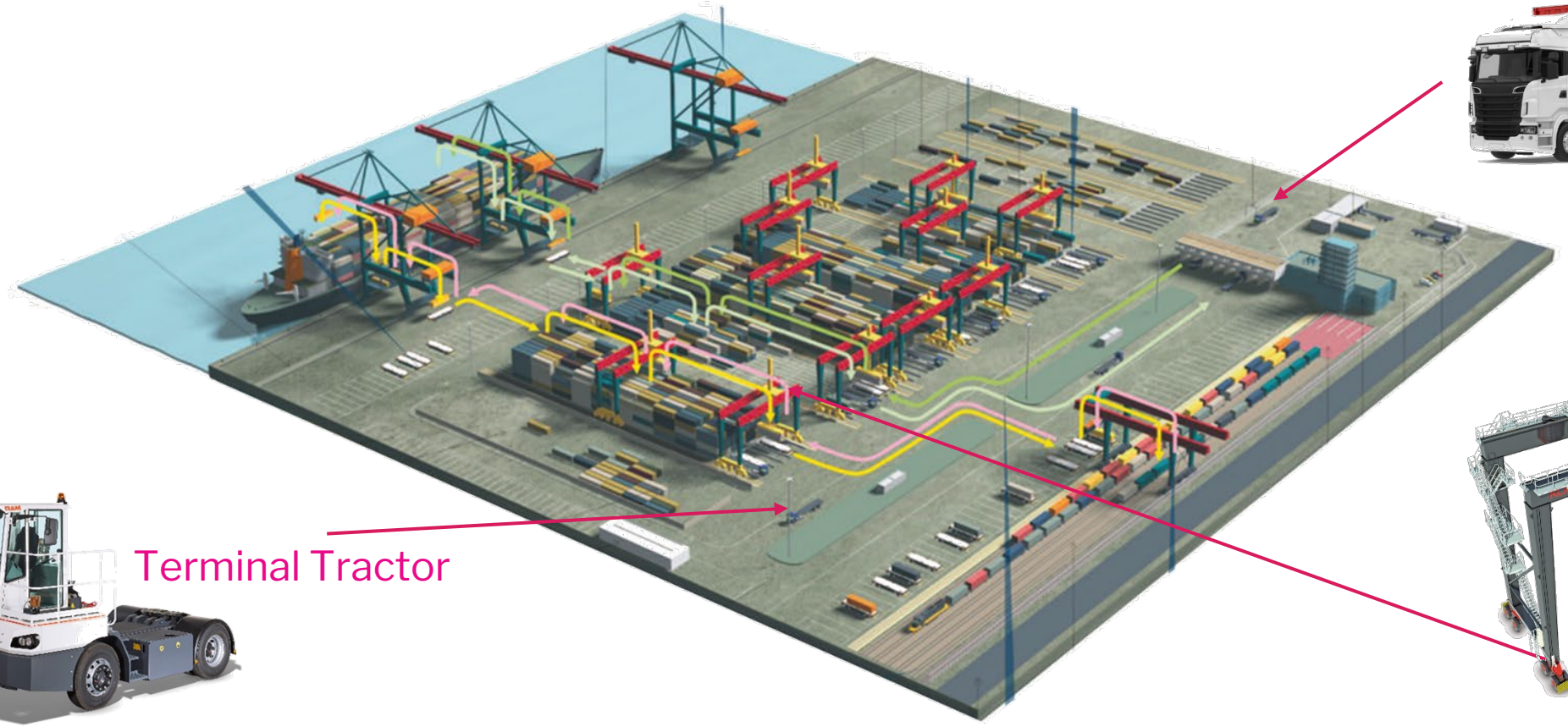
DataPorts
Data Platform for the Connection of Cognitive Ports

assist-iot

"To make shipping container industry efficient, reliable and environmentally friendly"

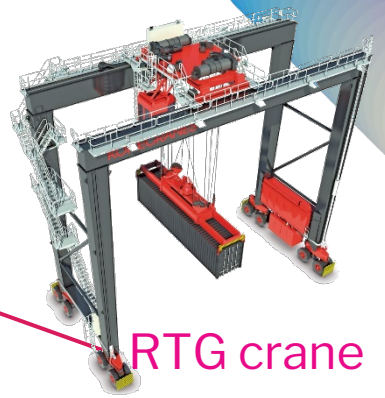
Container Terminal business

Terminal business is **to move boxes** with heavy equipment (CHE) in the most possible efficient way



External truck

Terminal Tractor



RTG crane

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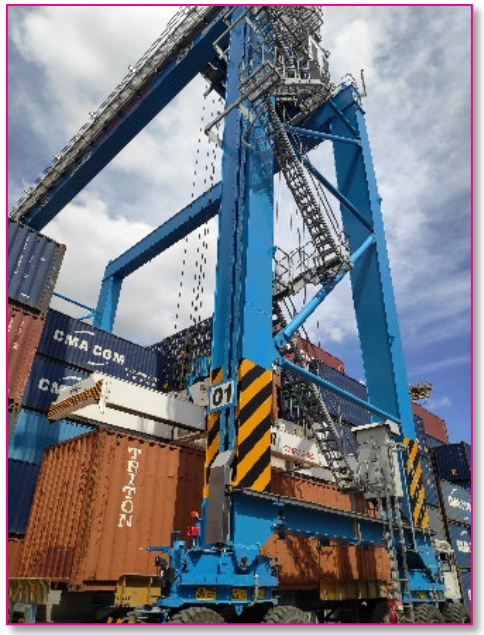
Malta Freeport Terminal, managed by TERMINAL LINK
A joint venture of CMA CGM and CMPORT

Technological development and integration performed by KONECRANES® and prodevelop

2 million containers / year → 5 – 6 million boxes moves per year

Available CHEs:

- Rubber Tyred Gantry Cranes (RTGs)
- Ship-to-Shore Cranes (STSs)
- Terminal Tractors (TTs)
- …



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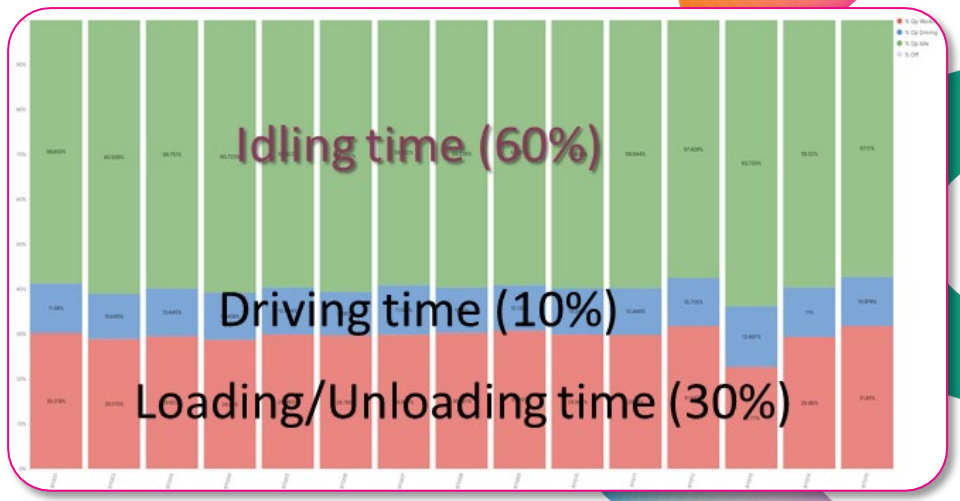
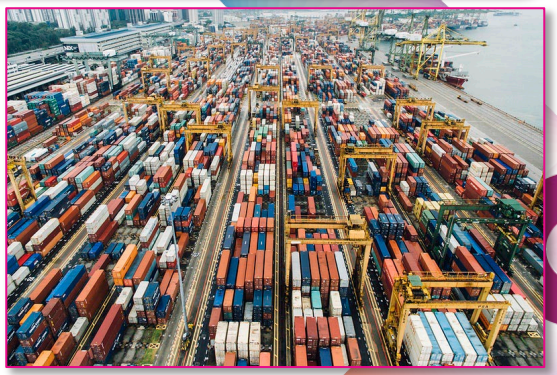
> **Will help on making better decisions to container terminal stakeholders by means of improving the availability of information over which the operators can interact with, as well as facilitating the automation of repeating workflows**

3 Business scenarios, with 7 use cases

19 functional/non-functional requirements





BS-1: Tracking assets in terminal yard

Motivation: operational efficiency can be improved by tracking/registering what and where are containers, and who makes the movements

Issues:

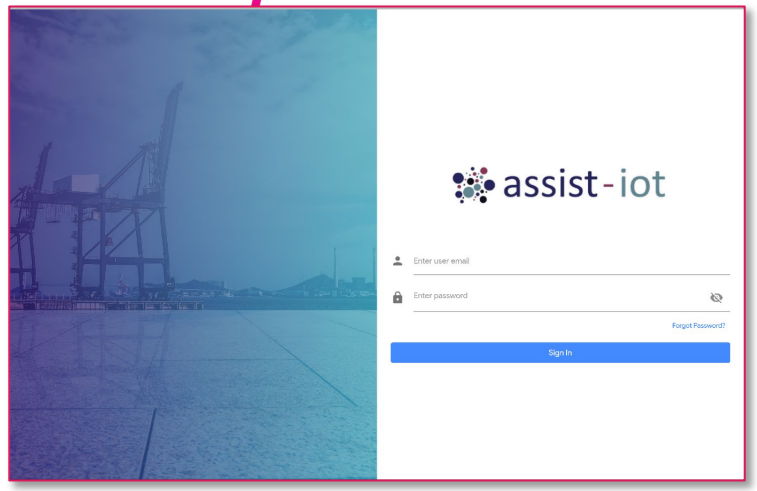
- CHEs shall be digitally located and tracked, and their activities shall be registered/recorded
- Containers cannot integrate positioning devices
- External drivers do not know yard layout

Role of ASSIST-IoT:

- **Distributed Positioning Detecting System in the edge**
- **Security-by-design authorisation system for different type of involved actors**
- **Easy-to-use human-to-machine interface**

Procurement activities

Development activities



BS-2: Automated CHE cooperation

Motivation: operational efficiency can be improved by reducing the time required for the alignment and loading containers processes

Issues:

- Cooperation between CHEs is currently performed manually, reducing productive working time
- CHEs must be aligned, but flexibility is very limited
- Most advanced solutions are centralised (potential hacks)

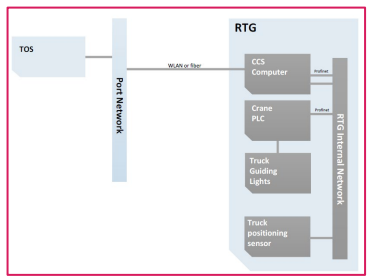
Role of ASSIST-IoT:

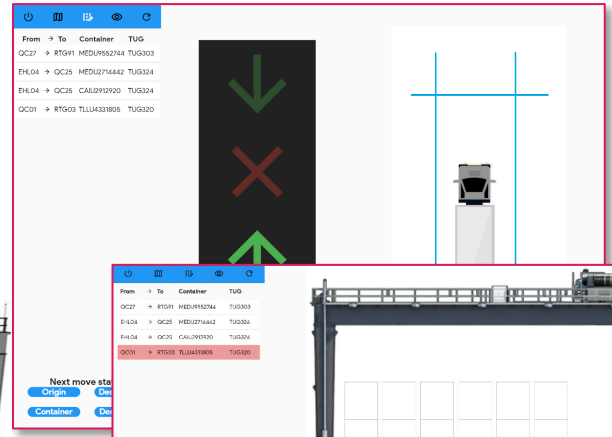
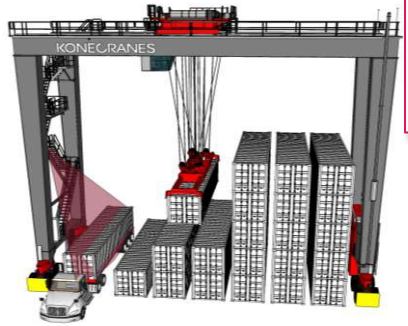
- **Secure multi-factor identification and authentication**
- **Machine-to-machine communication, including LIDAR sensors and actuators**

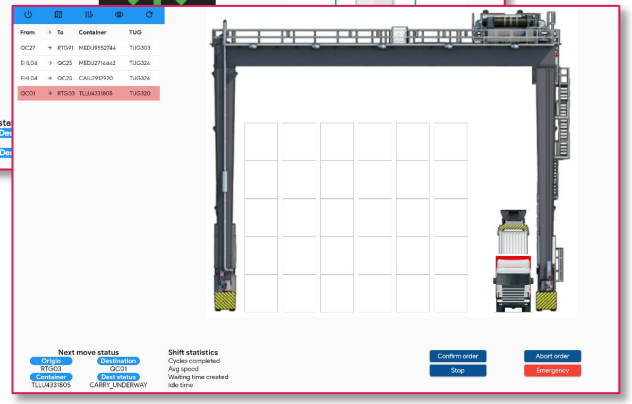
Procurement activities



Development activities





BS-3: RTG remote control with AR support

Motivation: manual cranes idling time is ~60%. The **operational efficiency + workers' safety** can be improved by moving the control of multiple cranes to more secure remote cabins

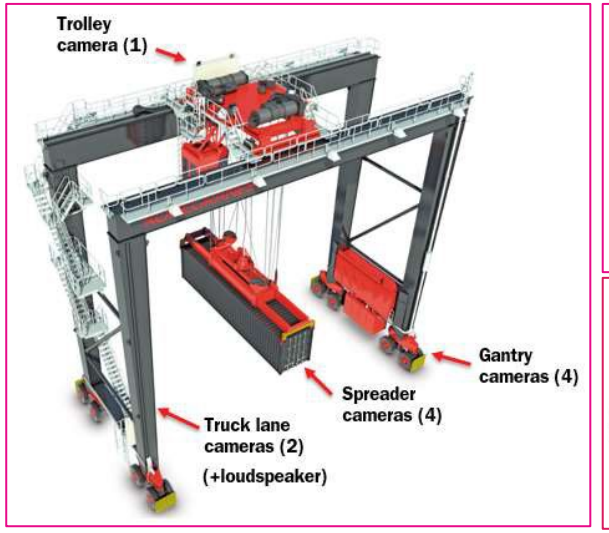
Issues:

- High deployment costs (> 20 M€)
  - Remote container crane operation required fully electric cranes
  - Remote OS required fiber optics (for reliable control and large bandwidth)
- Lower environment knowledge than crane's cabin

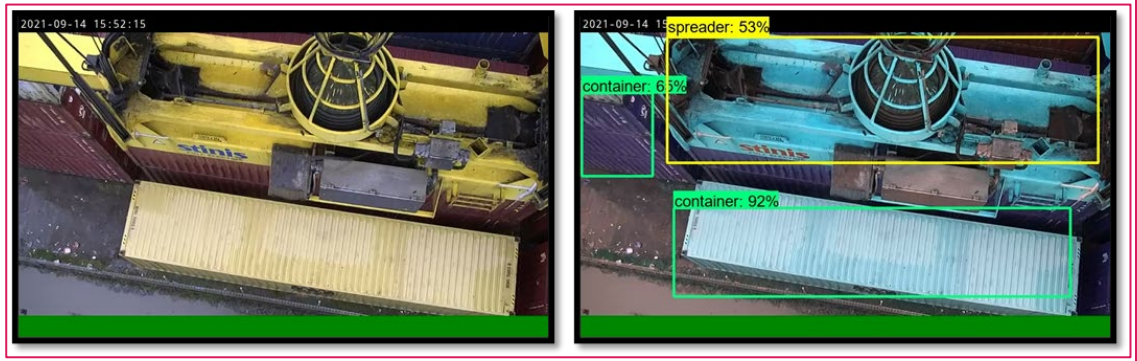
Role of ASSIST-IoT:

- **Resilient multi-link wireless (guaranteed High bandwidth Ultra-Low latency QoS)**
- **Computer vision interfaces over the Remote Operating System**

Procurement activities



Development activities



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ASSIST-IoT partners

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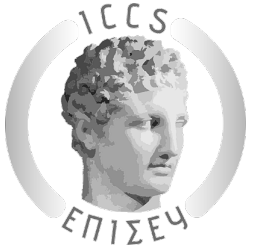

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Thank you!

Find more:

https://assist-iot.eu

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