



Real Time Port Project - RTPORT

5G-enabled smart terminal operations at the Livorno Port



Agenda

- RTPORT at the Livorno Port - Project Goals
- The General Cargo Logistics Use Case
- 5G Network Solution supporting RTPORT
- RTPORT Main Innovations
- Conclusions
- The RTPORT Livorno Living Lab Digital Twin





Real Time Port Project – RTPORT

New technologies and tools to increase port capacity, efficiency and safety with a positive environmental and societal impact



Automation

Full automation and digitalization of port operations

- Automated solutions to handle the seaport general cargo process
- Computer aided solutions to support general cargo goods handling

Efficiency

Optimization of port processes

- Increase operational speed
- Reduce operational costs

Sustainability

Reduction of the environmental impact

- Reduction of movements in cargo handling and consequent lowering of fuel consumption



Innovation

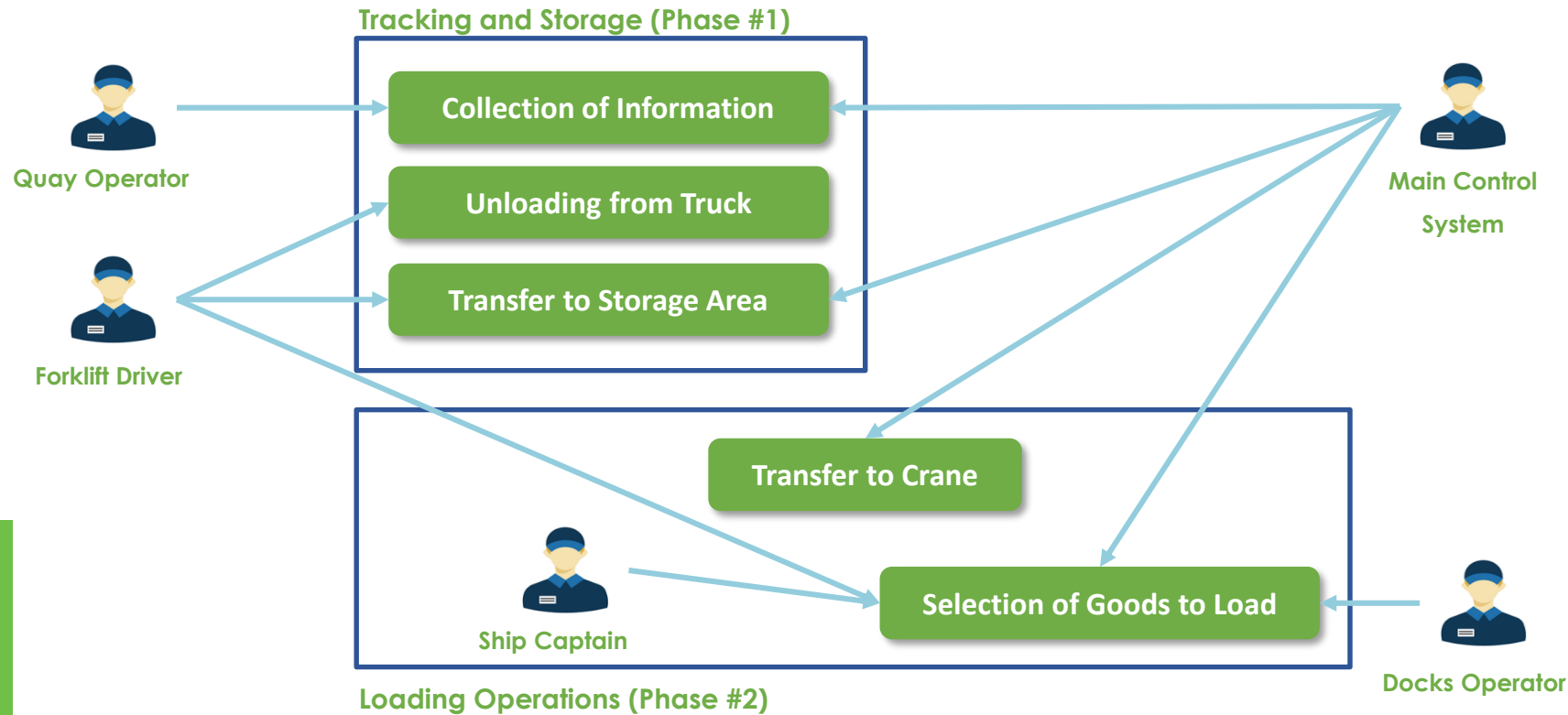
Strategic and innovative framework for cargo ports

- The project benefits from the use of disruptive technologies, including IoT, data analytics, AI, image recognition and emerging **5G networks** to achieve its goal.





The Cargo Logistic Use Case



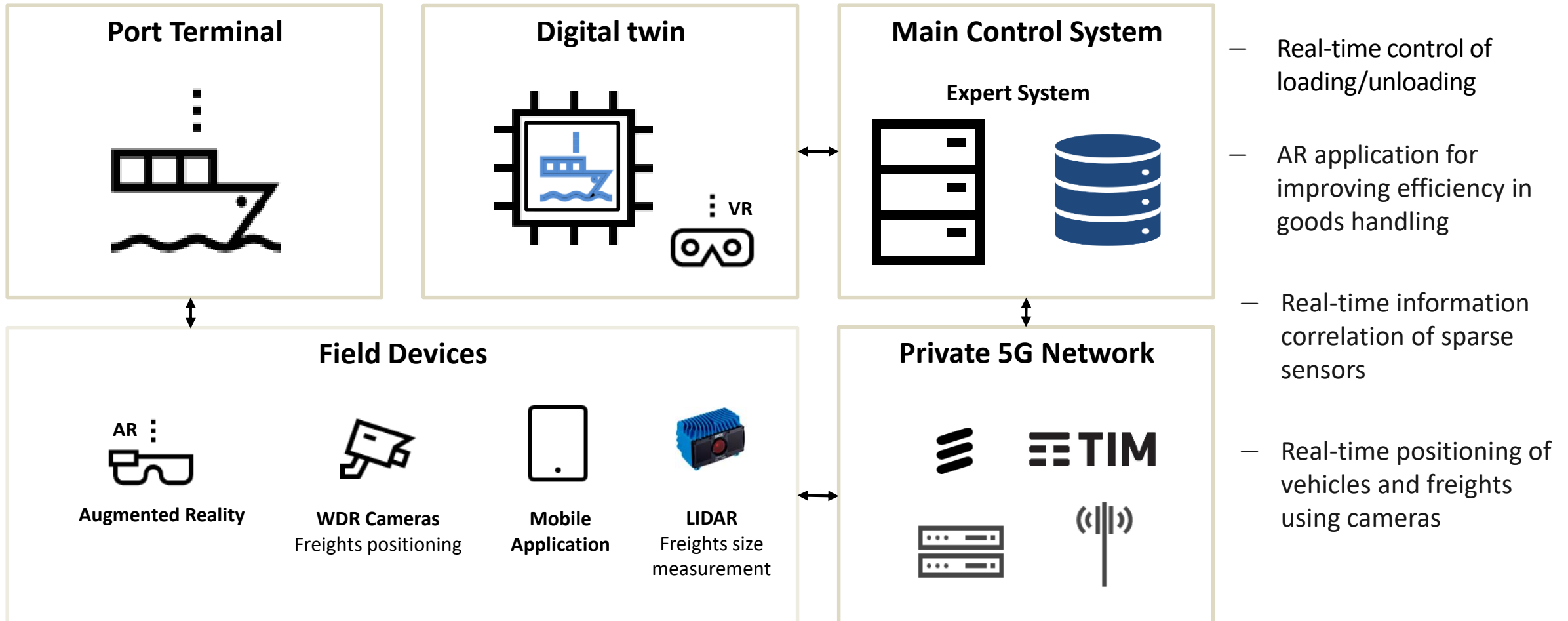
Bulk good handling

- No standard size
- No standard weight
- No automation on handling
- Difficult to optimize logistic operations for loading/unloading and optimize storage capability





5G technology enabling e2e port digitalization





RTPORT: Main Innovations

- Computer aided solution to automate the identification and registration
- Computer assisted location of goods in the docking area
- Automated solution to support workers at the docks in finding the proper pallet
- IoT Android Apps used as HMI with the smart control system
- Use of a relational database to handle the seaport process
- VR application for optimal sorting of freights
- 5G, providing more flexibility, higher bandwidth and low latency, is a key enabling technology for RTPORT:
- Enable through 5G network AR application for improving efficiency and safety in goods handling in the port area
- Need to correlate real-time information captured from sparse sensors and provide feedbacks to operators with very low latency
- Enable through 5G real-time positioning of vehicles and freights using cameras
- High bandwidth cameras for AR





Conclusions



Port Automation

Digitalization of port operations supported by new application technologies, Internet of Things (IoT), data analytics, and supported by state-of-the-art 5G networks.



Operational Cost reduction

Strengthen Port's competitiveness by increasing safety and efficiency in goods handling
Reduction of vessel berthing (6% average time saving)



Sustainability

Creating a cost-effective, economically and socially sustainable Port environment (-8% CO₂ reduction per freight operation due to reduction of yard movements)



Some References

Port of the Future Report

Addressing efficiency and sustainability at the Port of Livorno with 5G

Hannover Messe 2020 Award

Industrial Energy Efficiency Award Hannover Messe Digital Days 2020



The RTPORT Livorno Living Lab Digital Twin





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[COREALIS EU Project](https://www.youtube.com/COREALIS_EU_Project)



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THANK YOU FOR YOUR ATTENTION

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This project has received funding from the European Union's horizon 2020 research and innovation programme under grant agreement No. 768994