



Fully autonomous shopfloor logistics through mobile manipulators in medical equipment production.

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ENGROTEC GROUP

RAYA 2023 Finalist Event



Agenda

1. **System Components**
2. **System Features Overview**
3. **mobERT® Pilotphase TRL 8 – autonomous production on cell level @ MedTech Simulations**
4. **Customers drivers**
5. **Return on Investment**
6. **Results of Virtual Engineering Process**
7. **Why should mobERT® get the audience award today?**

Introduction – System Components

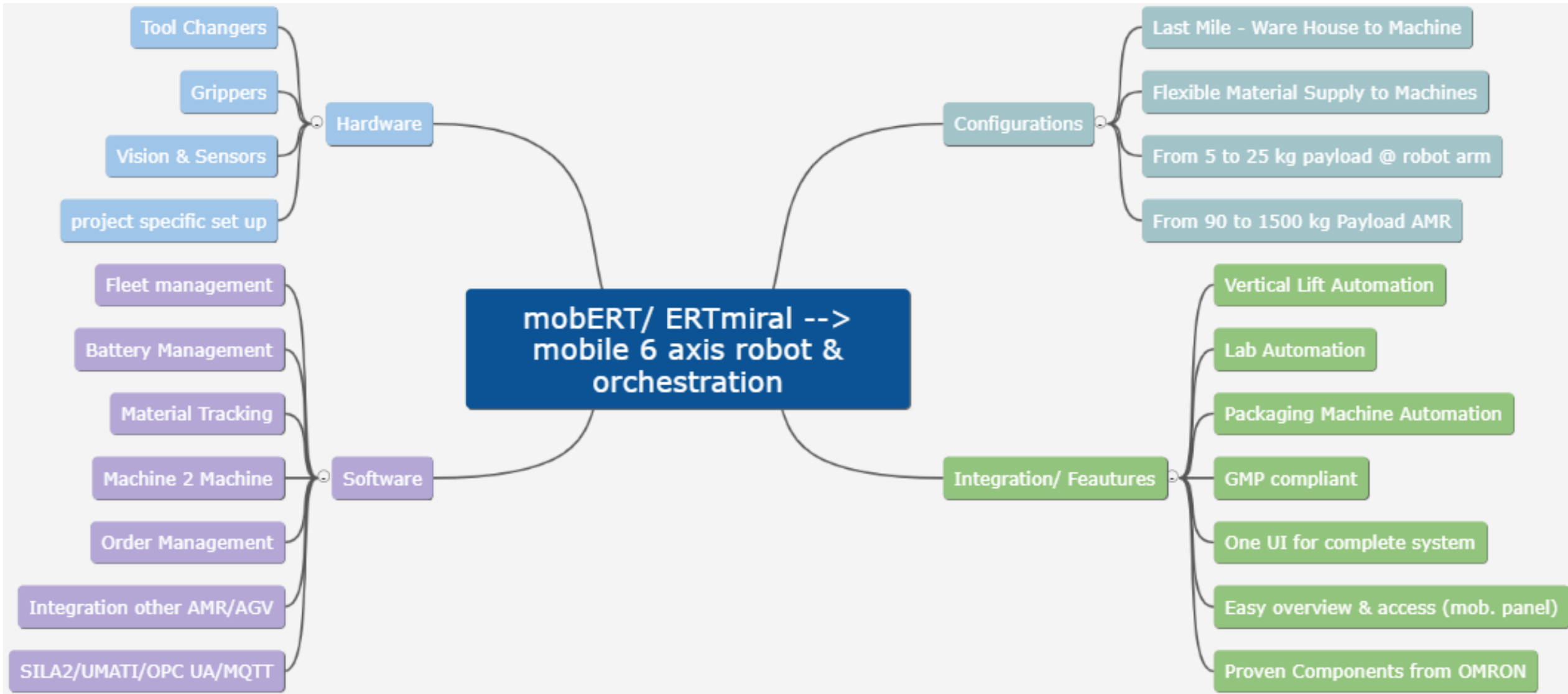


MOBILE MANIPULATOR
mobERT®



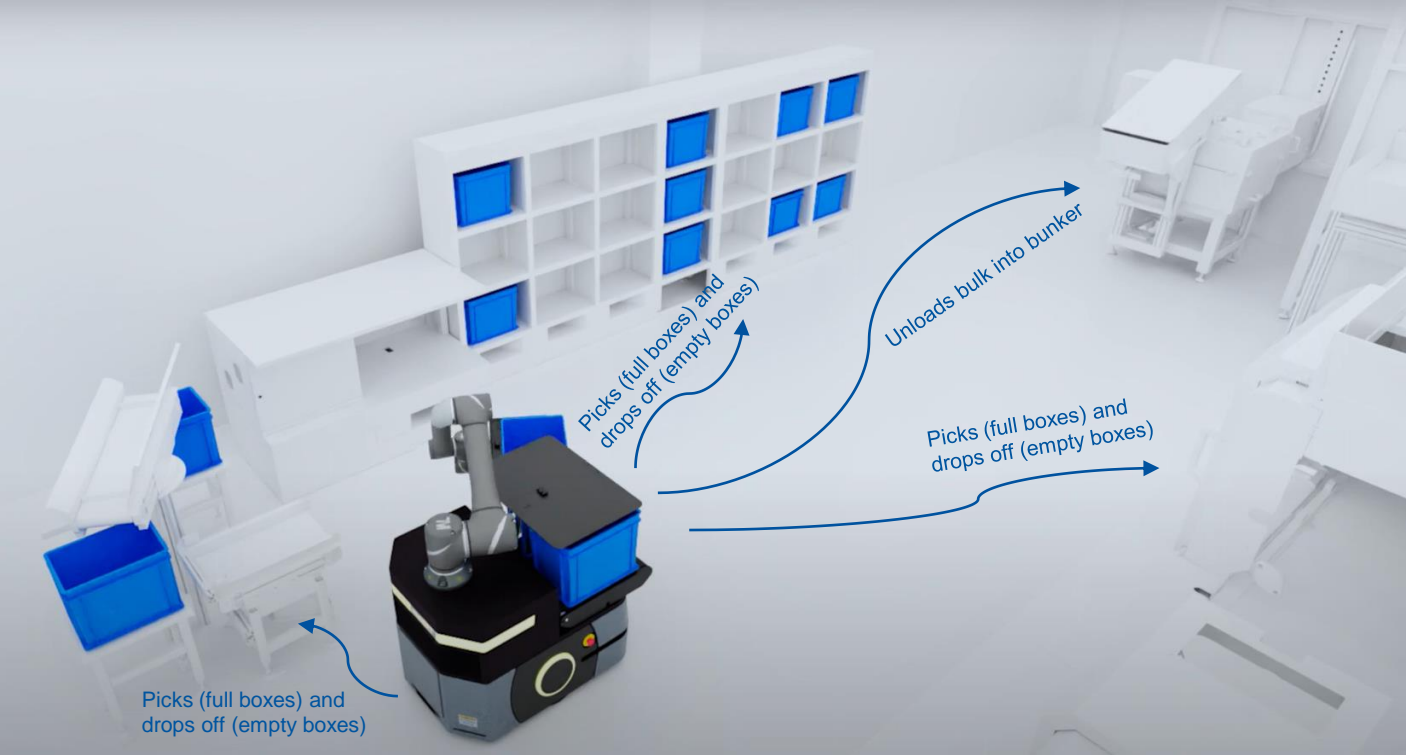
ORCHESTRATION SOFTWARE
ERTmiral

Introduction – System Features Overview



Introduction – mobERT® Pilotphase TRL 8 – autonomous production on cell level @ MedTech (Cleanroom ISO8)

FIFO – rack/ WIP rack with RFID readers



manual quality inspection controls station/ ERTmiral terminal (order & fleet management)

Assembly machines with automated lids

Injection molding machine with linear conveyors

mobERT® M14 (14kg Payload, 250 kg AMR, Mobile Manipulator) equipped with linear system for quick drop off & RFID tracking Positioning thru laser and 2,5 D camera system

Customers drivers

Doubling the output with existing machines and labor required:

- New building with over **16.000 sqm production area**.
- **Integration of existing machines** in new facility with possibility to:
 - Extension of production time
 - A higher degree of automation
 - Optimize the material flow
- **Increase utilization** of production equipment
- Solve the challenges for required labor
 - **unfavourable ergonomic situations** of e.g. loading and unloading machines specifically in cleanroom environment
 - do **not increase current work force** due to labor shortage



AR Scenario: digital twin of new facility in real environment

Return on Investment

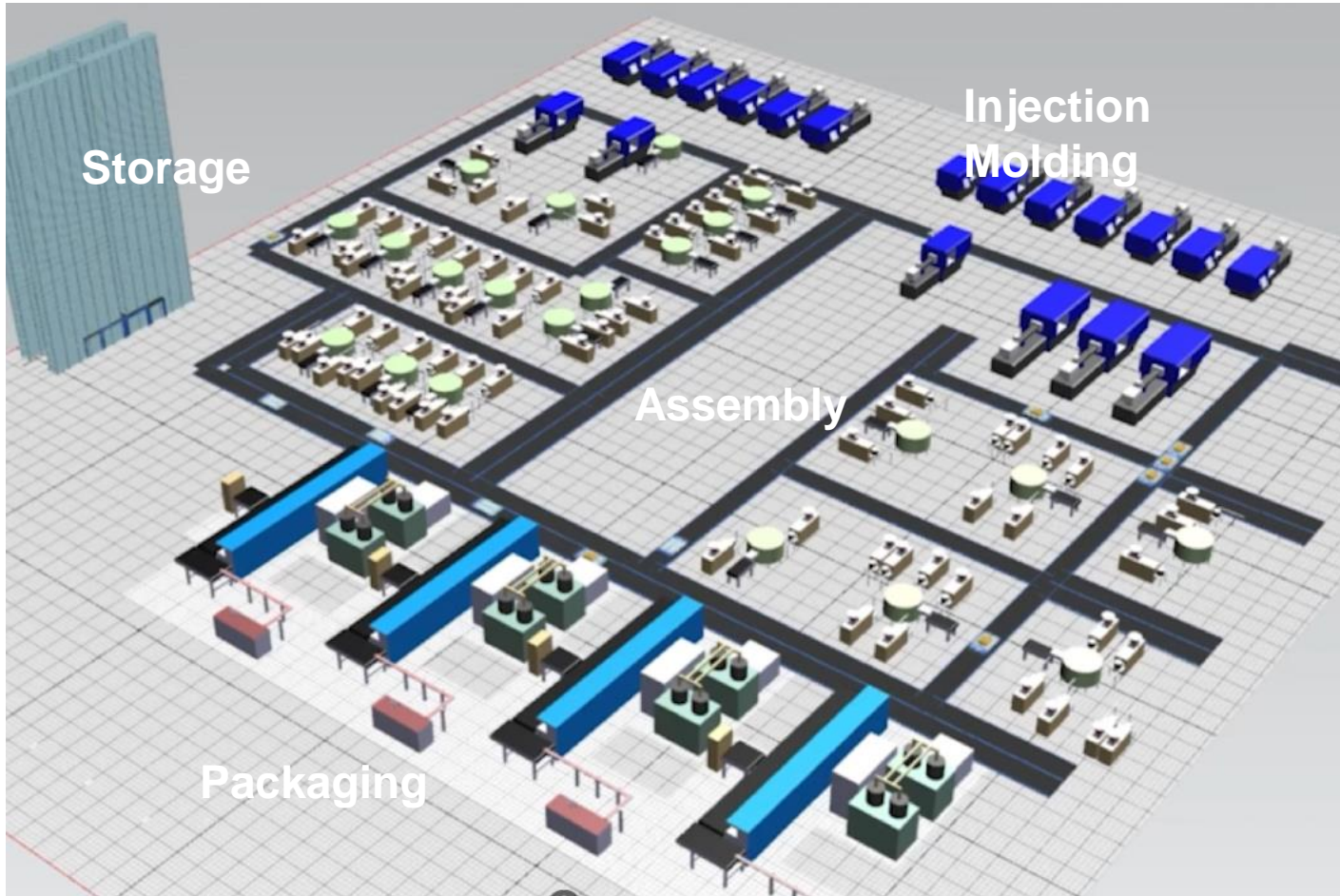
mobERT® in connection with ERTmiral software:

- *can handle multiple tasks @ different locations → high utilization*
- *consists of proven components from OMRON (AMR and COBOT technology)*
- *is available in different configurations & software features which adds to the flexibility of the system*
- *non value added & non ergonomical work is eliminated*
- *lets the work force focus on value adding and motivating work*

- *applications are not bound to MedTech, further apps are currently in works:*
 - *Pharma Industry (Lab Auto, Secondary Packaging)*
 - *Service Industry (Donor Centers, Hospitals, Caring facilities)*
 - *Tooling Industry (Machine Tending incl. closed quality loops)*
 - *Plastics Industry (Machine Tending)*

Straight ROI estimation without considering above mentioned benefits →
1.9 years in 3 shift scenario in presented set up (Pilot).

Results of Virtual Engineering Process



User Requirements Spec after full virtual engineering process:

- 6 AMR with one conveyor belt (mobERT® C)
- 6 Mobile Manipulators (mobERT® M14)
- 2 fully automated robotics stations (ABB heavy duty robots) for part storage
- „ERTmiral“ as orchestration middleware with direct interface to MES.
- Connecting:
 - one 4 story storage system (SSI Schäfer)
 - 19 injection molding machines (SMG)
 - 20 assembly machines (self made)
 - 4 packaging machines (primary packaging)
- Full GMP validation process

Project target:
Full implementation 06/2025

Why should mobERT® get the audience award today?

mobERT® is the only mobile manipulator on the market which has been implemented into a series production.

mobERT® has been developed towards modularity and can be used highly flexible in multiple apps.

Virtual engineering tools & standardized software compliment the system for low risk integration and operation.

Get your SNEAK preview in any environment through our free AR tool – available soon!

mobERT®

ERTmiral
FLOTTENMANAGER

mobERT® @ AIRA Challenge 2022

THANK YOU!



EngRoTec's mobERT® achieving 3rd place in the AIRA robotics challenge @ ACHEMA 2022