

Automation in the CSSD

Benefits and opportunities

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Quality
Patient safety
Efficiency

The Danish expertgroup recommendations

- Centralizing of reprocessing
- Case cart deliveries
- Use of automation
- Standardization of instrument trays
- Increased use of disposable instruments



Pilot projects were automation and use of robotics were in focus.

- The Defu Stepp project was running over three years from 2010. 15 companies joined as partners.
- The goal was the development of a fully automatic CSSD. The project had four focus area:

Sub-projects:

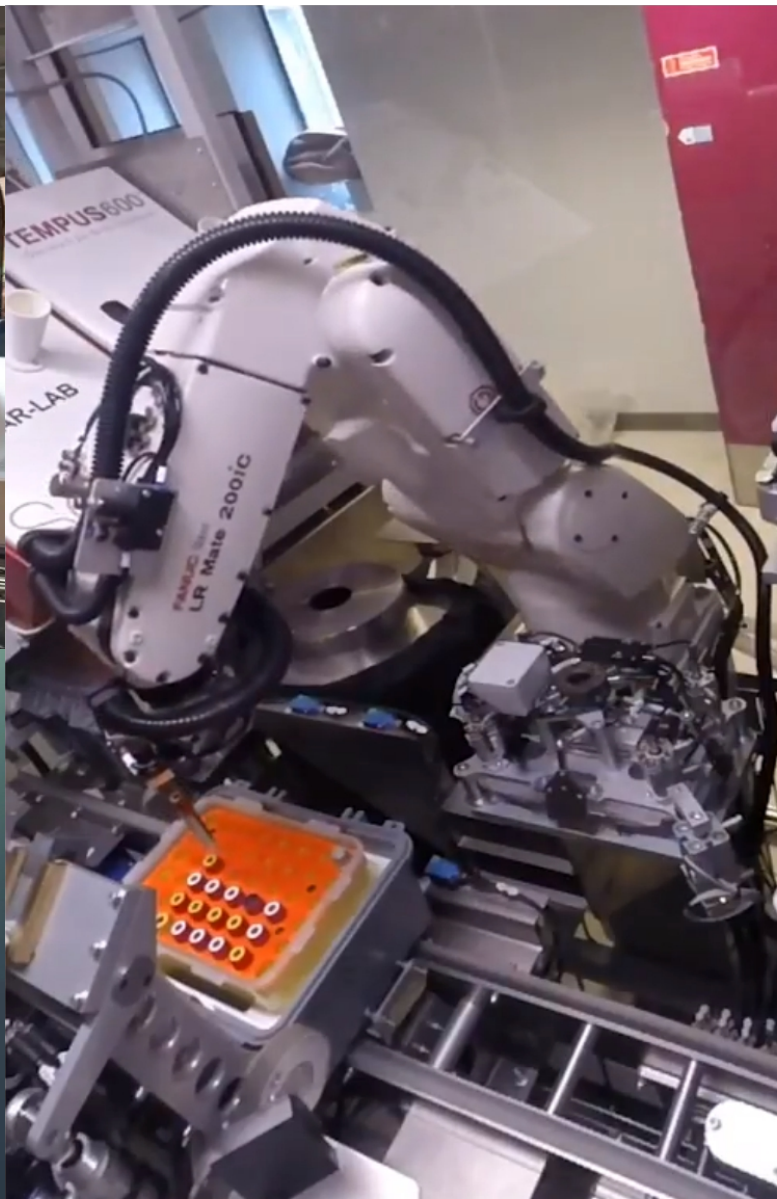
- Overall production planning in the CSSD
- Automation of sub-processes in the unclean area in the CSSD
- Development of autoclavable case cart trolley which also form the sterile barrier
- Automatic attachment and removal of instrument containers (cabinet washing machine)

45% of your workflows can be automated with robotics

Source: McKinsey Quarterly, nov.2015



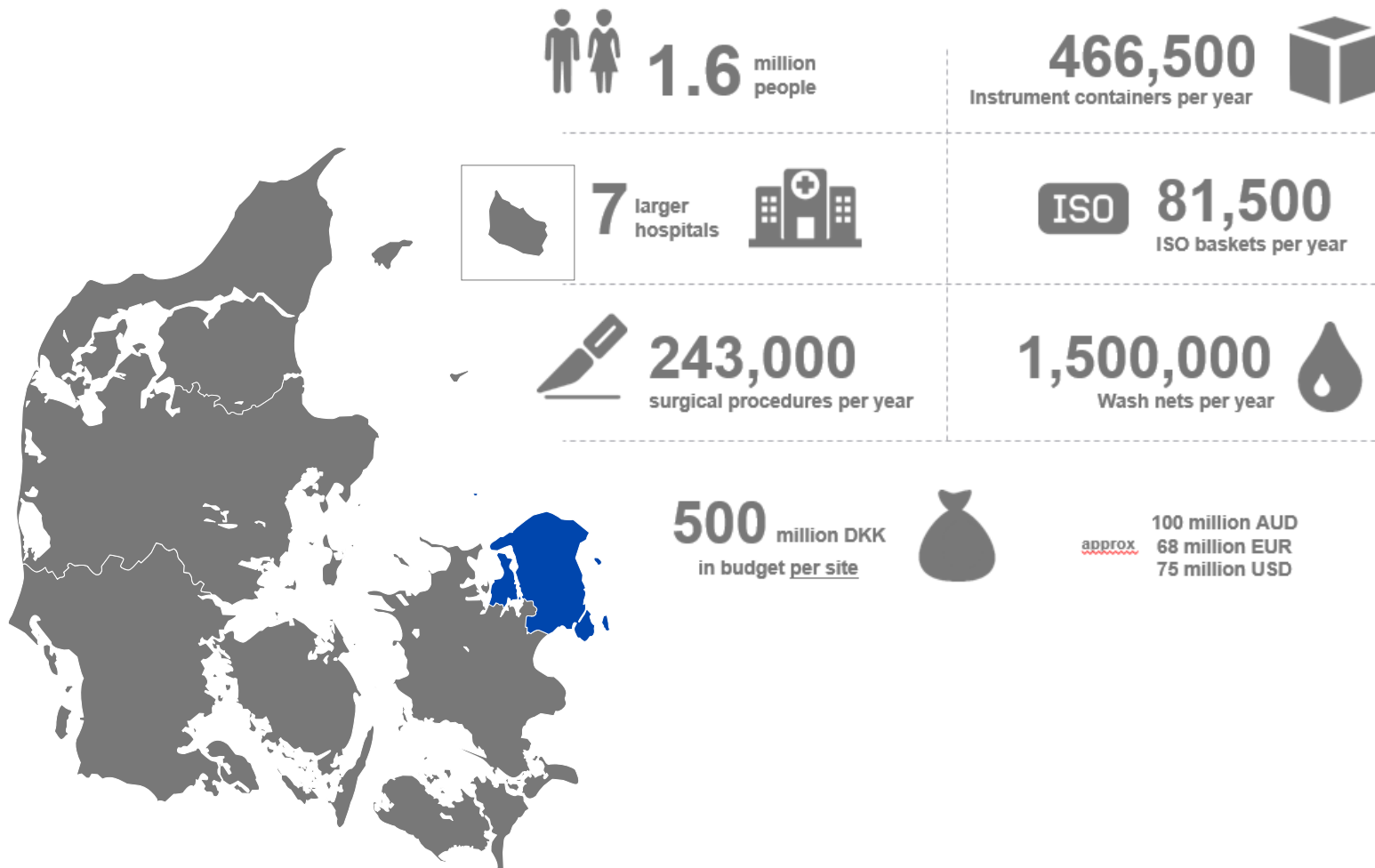
Automation in healthcare sector



Automation CSSD - opportunities

SUITABLE FOR AUTOMATION	TECHNOLOGIES
Transportation of goods	Transportation systems AGVs and transport cabinets (shuttler) Storage cranes and lifts Robots
Storage facilities	High-bay racking system, i.e. automatic mini load storage Storage robot
Lift, push, stabling, loading/unloading, open/close, handling etc.	Robots AGVs (Automated Guided Vehicles)
Control systems (recognizability and weight)	Vision- and weight systems
Control of flow, functions and locations	MES (Manufacturing Execution Systems) WMS (Warehouse Management Systems) PLC, etc.

2 Centralized, automated sterilization centers



Conditions and requirements

- The two central sterile units must be identical
- Design and work flow must be uniform
- Workflow to automate as far as possible and must be identical for the two sterilization centers
- Maintenance of equipment should be coordinated as much as possible
- Use of standard instruments

1. AUTOMATIC TRANSPORT OF GOODS

The "good old days" ...

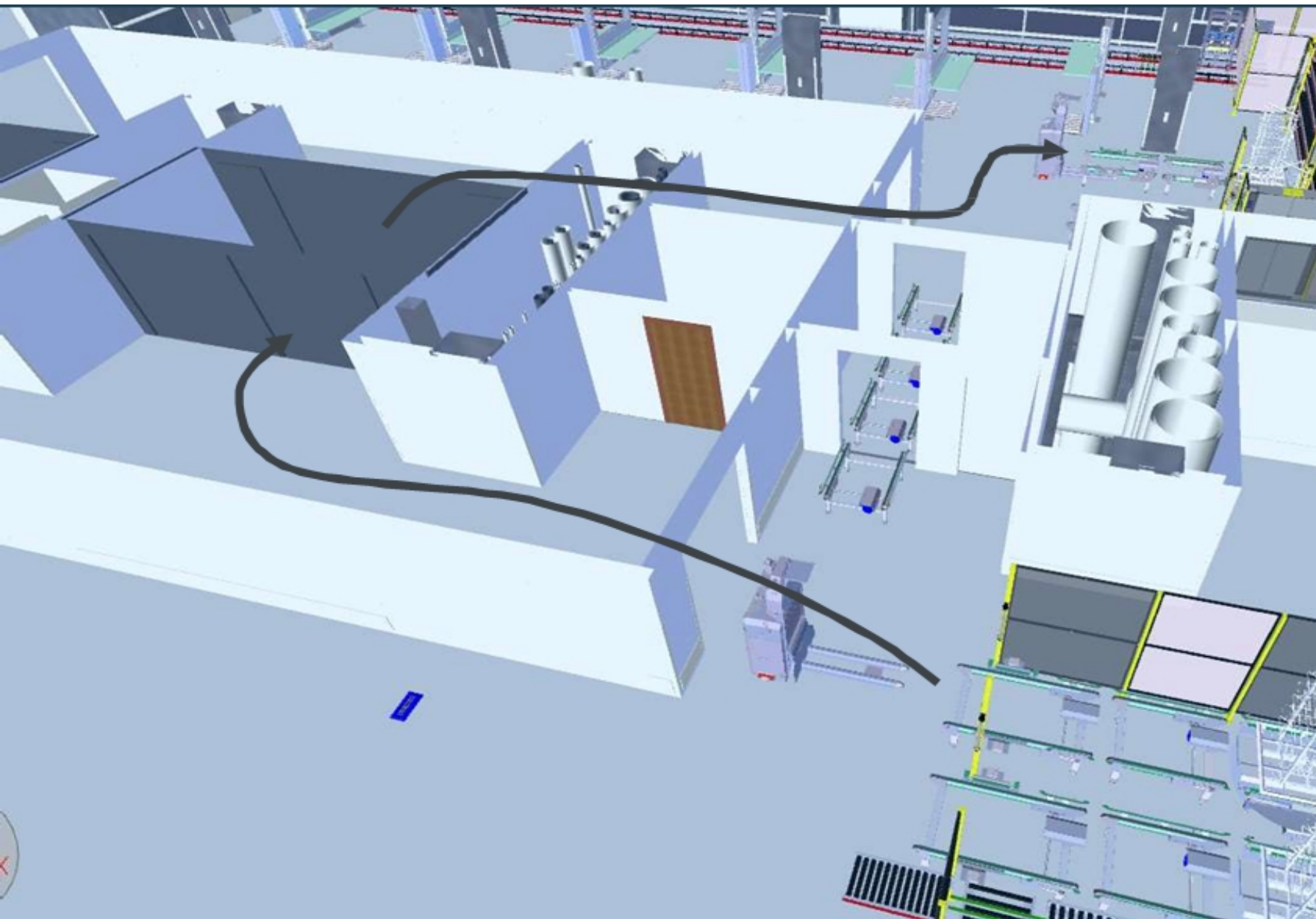


Now or future

- AGVs = Automated Guided Vehicles
- ~~Roller conveyer transfer cabinets (shuttles)~~
- Transport systems
- Transport trolleys
- Autoclave racks
- Washing racks with instrument containers etc.
- Washing stands with instruments



AGV – Cabinet washing racks



AGV – Boxes, instrument containers, racks – and placing item on/off washing



Roller conveyer - transfer cabinets



2. STORAGE FACILITIES

The "good old days"...

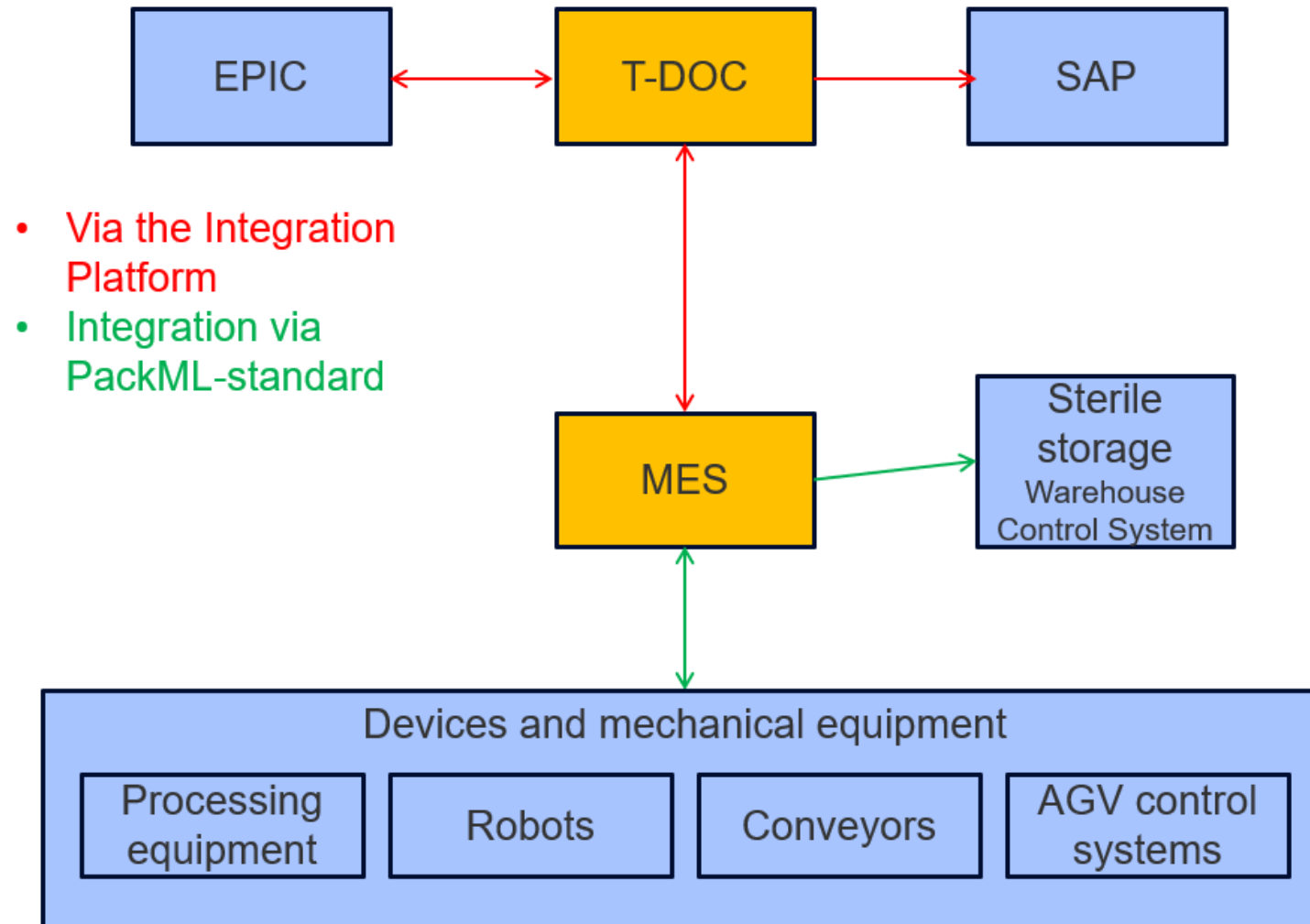


3. HANDLING, LOADING & ONLOADING

The "good old days"...



4. CONTROL SYSTEM & FLOWS

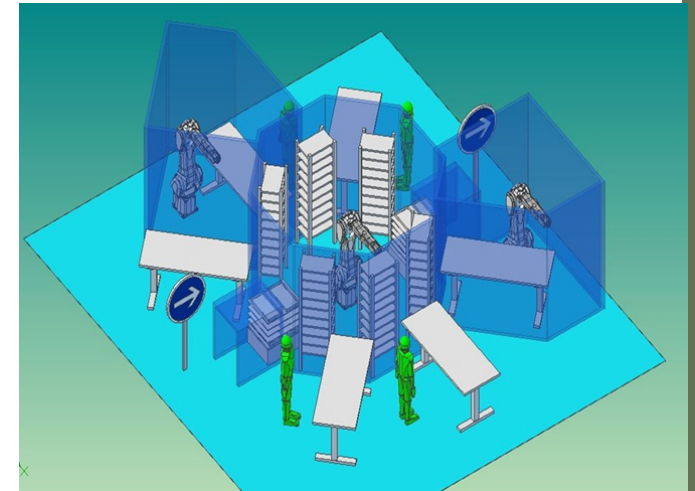
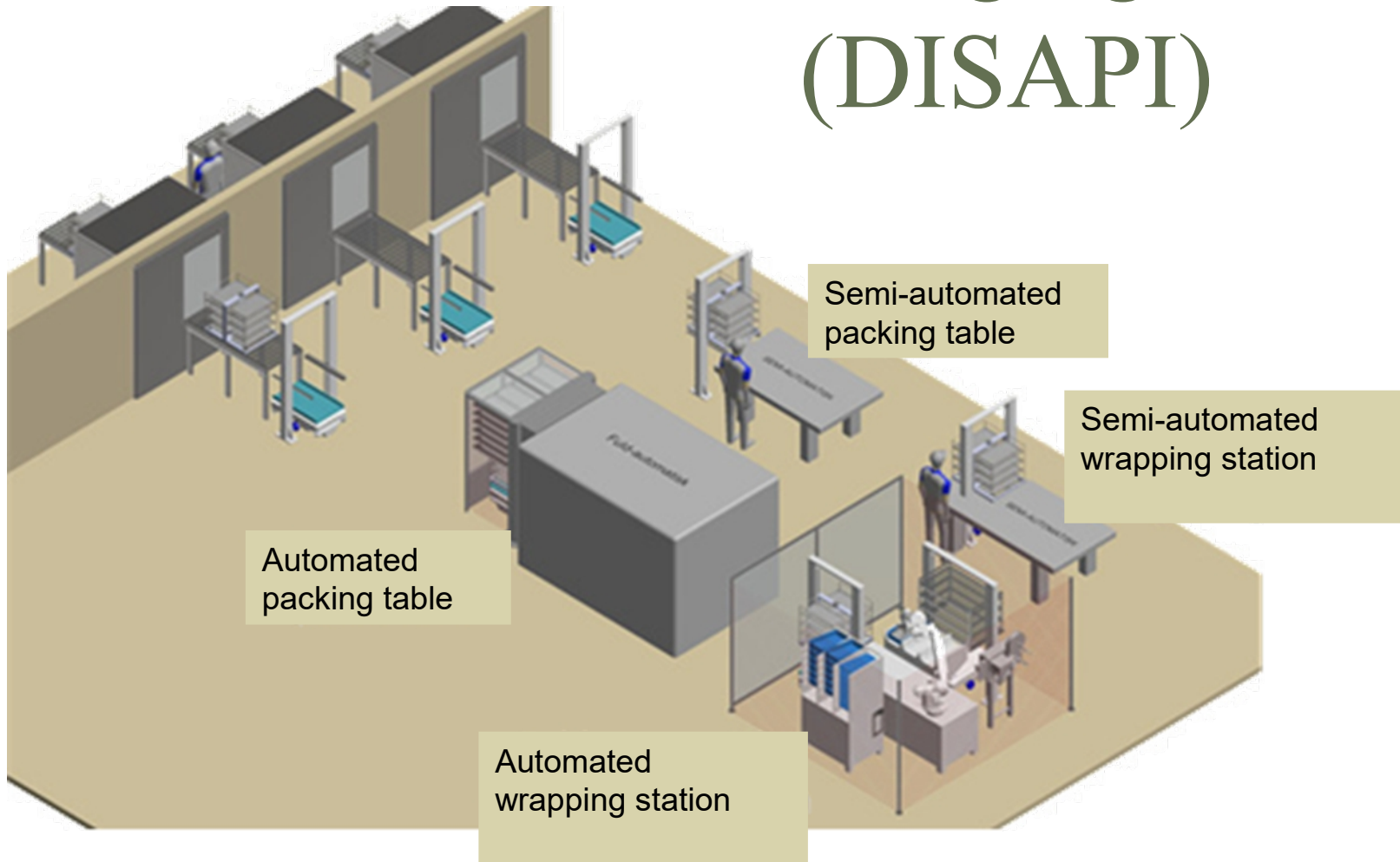


CHALLENGES

- Hygienic design
- Space for cleaning

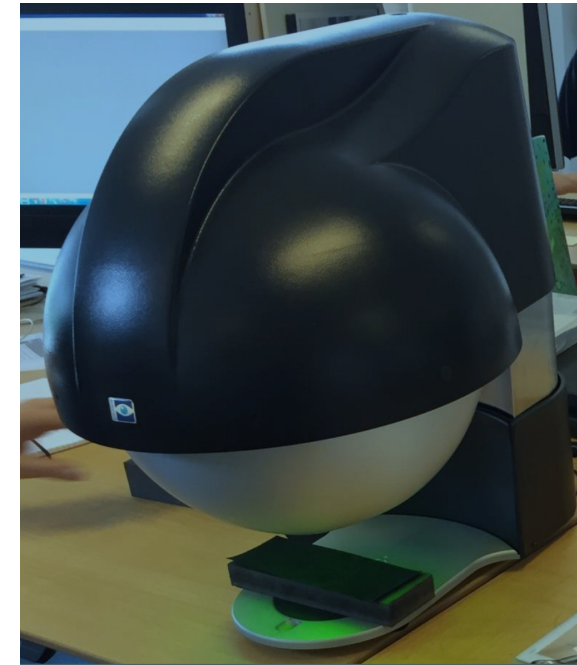
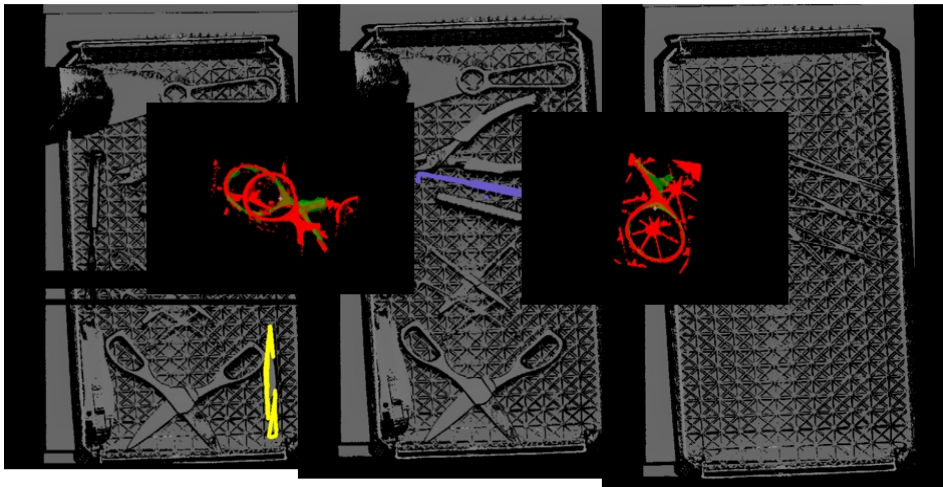


The Intelligent reprocessing unit- Automated Packaging and Inspection (DISAPI)



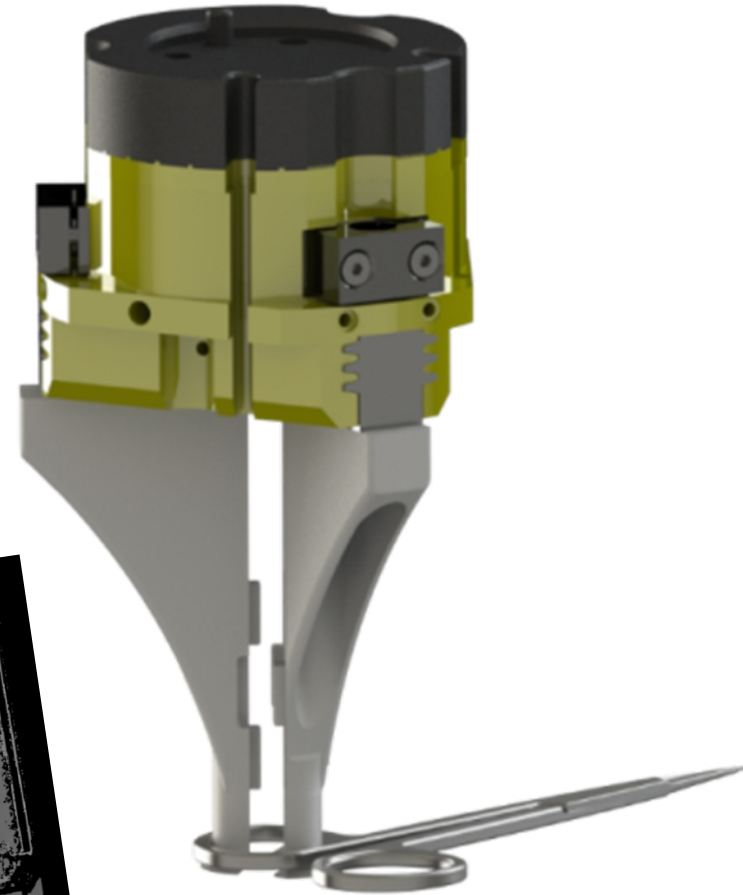
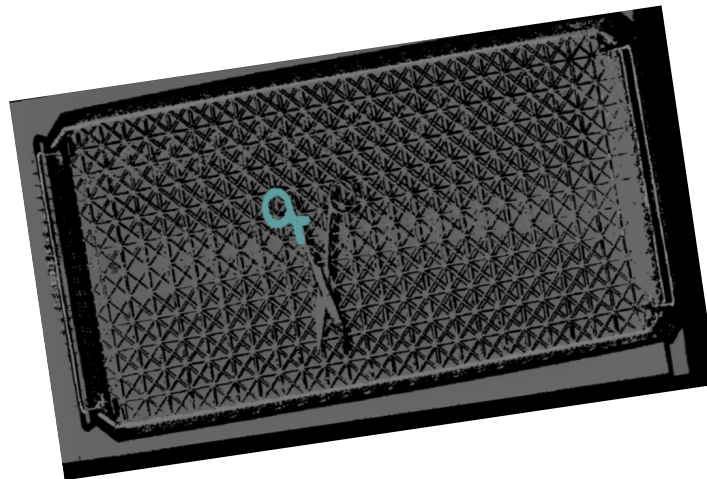
Fully automatic cleaning control

- Based on multi-spectral vision, and automation technology
- Identify debris on instruments
- Evaluation of the instrument is clean, unclean or in need of further control
- Potential for detection of corrosion damage

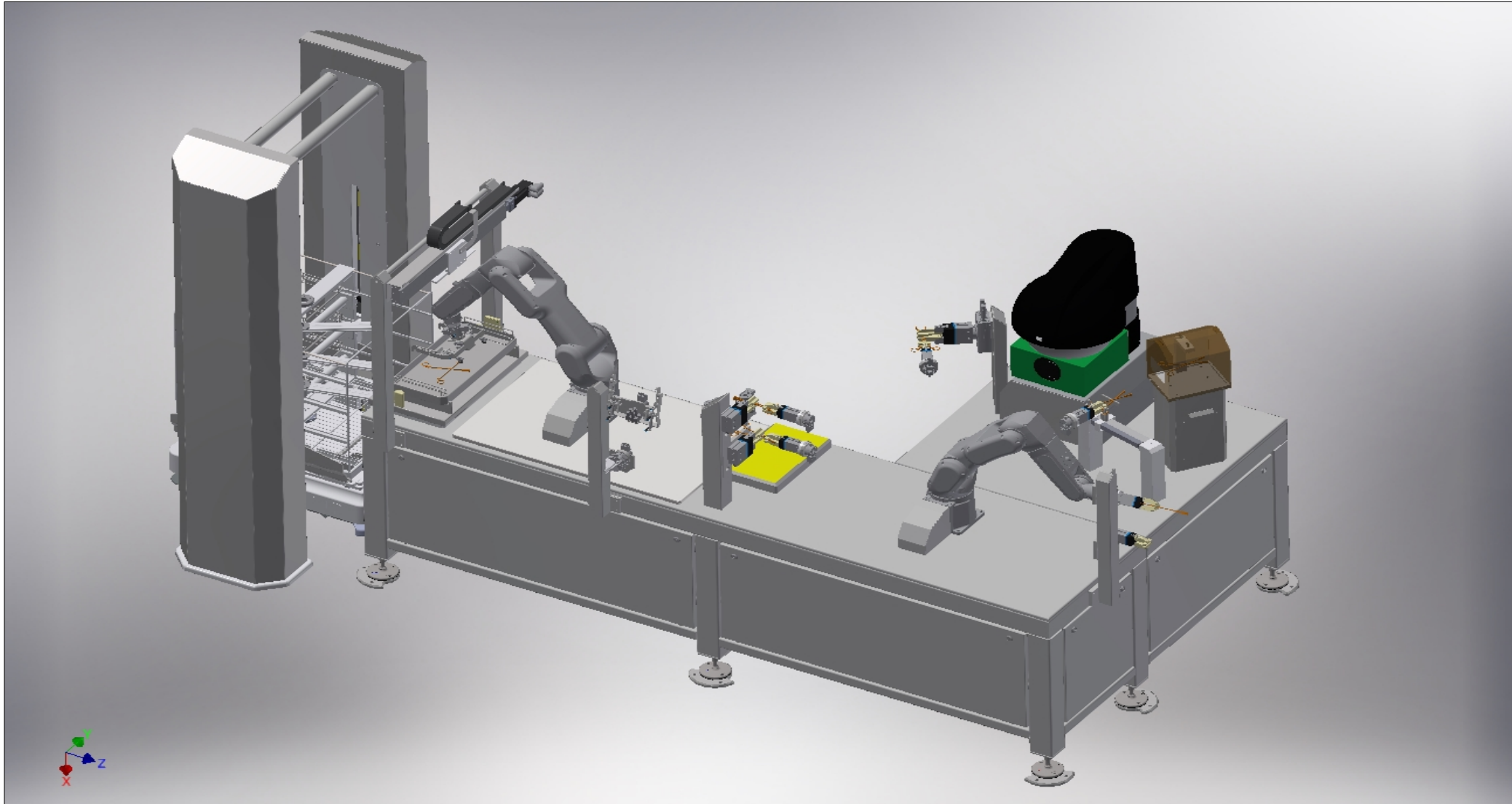


Vision - recognition of instruments

- The solution uses a combination of camera and laser scanning
- The position of the instruments in the trays is dented - Robot gripper
- Gripper, which is so flexible that it can handle all the selected test instruments



Fully automatic packing table



Benefits and opportunities

KEY WORDS

- Minimization of errors - increased patient safety
- Precision - Documentation and Traceability
- Better working environment - Ergonomics
- Increased efficiency