

D~~X~~ARIA



I4.0 Solutions.
Delivered.

...in brief

Vienna, December 2019

INVENTORY OF TOMORROW: DRONES

The Future



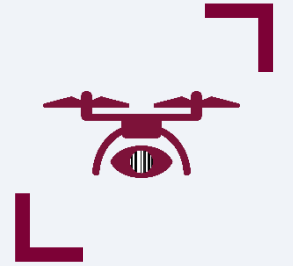
AUTOMATED STOCK-TAKING

Drones fly automatically inside the warehouse and check inventory levels



AUTOMATED DATA HANDLING

Automatic identification of deviations between target and actual levels, and initiation of corrective measures



Advantages



SPEED

Drones move fast, capture labels quickly and reach great heights easily



CONTROL

Precise monitoring of inventory levels and immediate identification of losses



RELIABILITY

Always check your inventory with >99% reliability



INDEPENDENCE

Operate the drone outside of working hours and at night



EFFICIENCY

Employees can be used for more meaningful tasks instead of counting inventory



PRODUCT ARCHITECTURE: DJI BASED

System Configuration

NAVIGATION

- ◆ Robust indoor navigation without GPS
- ◆ In-house developed, more powerful than industry standards
- ◆ Automatic routing along shelves
- ◆ Within an aisle

DRONE

- ◆ Camera-based automatic label-capturing
- ◆ Automatic label and barcode processing
- ◆ Automatic determination of inventory location
- ◆ Automatic return to home-base

HOME BASE

- ◆ Drone handling, change of batteries
- ◆ Automatic data-transfer

SOFTWARE INTERFACE TO WMS

- ◆ Automatic processing and transmission of inventory data to WMS



HOW IT WORKS: FLYING BARCODE-SCANNER

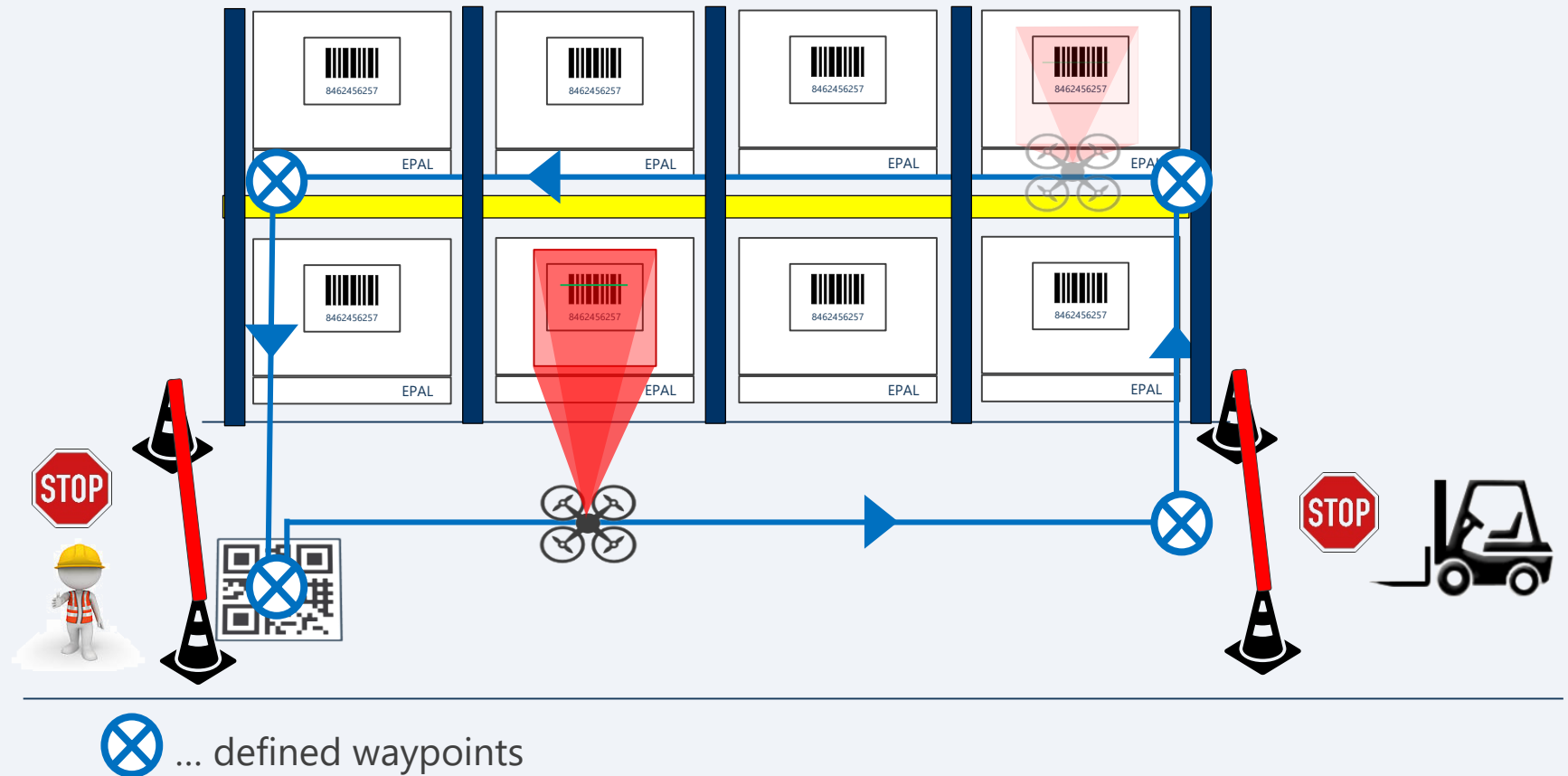
System Setup

NAVIGATION

- ◆ Defined route is flown
- ◆ QR-Code is start- and landing point
- ◆ Waypoint in x/y/z defined

SAFETY

- ◆ Aisle is closed for operation
- ◆ VLOS – visual line of sight – observer monitors the operation
- ◆ Manual intervention possible
- ◆ JARUS SORA approved
- ◆ In cooperation with relevant professional cooperatives



THE CONCEPT: Requirements and Results

Concept

What we
need and
what we do!

Premises

access to your premises;
preparatory talks with h&s dept.;
permission

Information

layout of
warehouse incl.
heights; storage
positions; ERP-
extraction

Processing

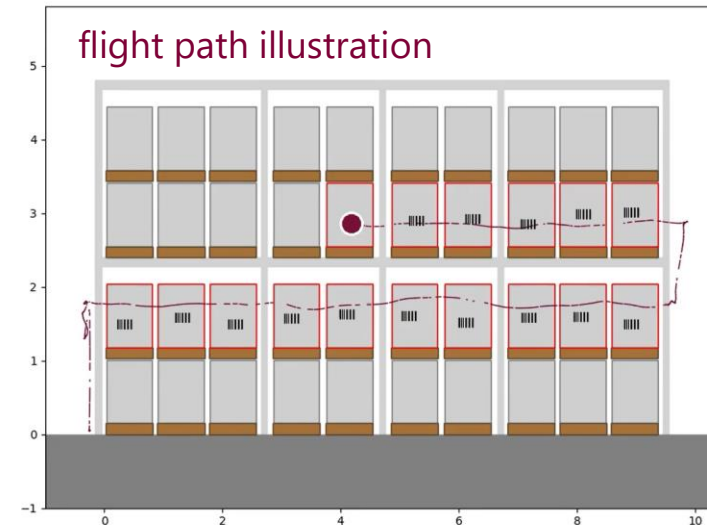
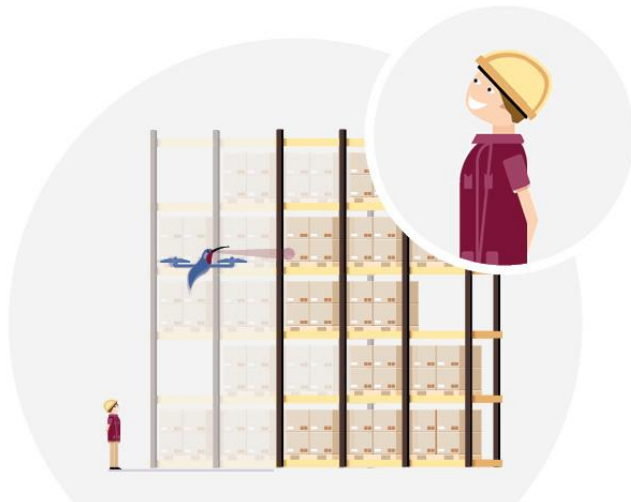
Data prep.s (ERP-data 2 xyz) and flights (lane by lane / random sample)

Output

Pictures of storage positions;
comparison of ERP vs. live-data

Added Value

CSV-file with
deviation data
identification in
terms of set-
actual



video stream



data logging

[illegible]

D-ARIA: BENEFITS!

- **ELIMINATE SAFETY CRITICAL PROCESSES**
 - ◆ People are not meant to work in heights
- **ENSURE AVAILABILITY AND STABLE SUPPLY**
 - ◆ Inaccurate inventory records lead to interruptions in production
 - ◆ Every minute of stoppage / every reworked product is a disturbance to the system
 - ◆ Don't let your customers wait
- **INCREASE SUPPLY CHAIN PERFORMANCE**
 - ◆ Increase liability in inventory data
 - ◆ Reduce your inventory and benefit from less working capital and less m² occupancy
 - ◆ Prove your accounting and financial auditor that you have your inventory under control
- **ELIMINATE NON-ADDED-VALUE PROCESSES**
 - ◆ Less overtime / Less extra shifts on weekends by automatization
 - ◆ Availability of skilled work-force is critical in many regions



D-ARIA: CRITICISM?

- **WHAT ABOUT THE MATERIAL ALREADY IN USE?**

- ◆ Partial pallets need to be counted as in the past - let this be done by the production departments

- **WE HAVE A DEVIATION OF LESS THEN 1% IN OUR YEARLY AUDIT!**

- ◆ Congratulations – most of the high developed companies have come that far
- ◆ Let's challenge the next level and use D-ARIA as an initiator to increase your supply chain performance
- ◆ BTW: Are you sure that your operations abroad have reached the same maturity level?
- ◆ BTW2: Who is counting your inventory at your customer 's location (VMI)?

- **WE RUN CONSISTENT ERROR-PROOF BARCODE-SCANNING!**

- ◆ Who guides the guardians? No system is 100% error-proof – let D-ARIA detect your weakness and change to the better

- **DRONES ARE TOO COMPLEX AND RISKY – I CAN'T HANDLE THAT**

- ◆ D-ARIA welcomes you to book stocktaking as a service – we want you to see and learn
- ◆ D-ARIA is JARUS SORA approved and complies with the relevant safety standards*
- ◆ D-ARIA does not leave the customer until we have a good feeling that the customers can handle the drone



*Specific Operations Risk Assessment Project Nr. 03_339_209, 2018-12-14 document can be provided upon request

D-ARIA: BUSINESS MODELS

0. MVP – Get to know D-ARIA

- ♦ **Manual flight with barcode recognition**
- ♦ 0.1 Calculation based on to the time spent and inventory results acknowledged by the customer
- ♦ 0.2 Licence agreement – drone handed over to customer, training, maintenance and support provided by D-ARIA
- ♦ **Results: CSV-file showing identified label information per storage location + pictures of storage location**

1. PROVIDER – Operator model

- ♦ **Inventory as a service**
- ♦ 0.1 Calculation based on to the time spent and inventory results acknowledged by the customer
- ♦ 0.2 Licence agreement – drone handed over to customer, training, maintenance and support provided by D-ARIA
- ♦ **Results: csv-file showing identified label information per storage location + pictures of storage location**

2. OWNER – Hardware incl. implementation + parameterization + service contract

- ♦ **Customer User – integration in customer processes**
- ♦ Customer acquires a ready-to-use solution for the application in his infrastructure
 - ♦ Hardware / Software / Training
 - ♦ Service contract including Maintenance and repair (if necessary)

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