

*Automation, Sustainability and  
Digitalisation as enablers of  
next level End-to-end Baggage &  
Passenger Solutions*

ICAO – ACI seminar, Bangkok Thailand

Vanderlande | Fons Hoeberichts

29 June 2023

## **Content**

- › **Introduction Vanderlande**
- › **Passenger Solutions**
- › **Baggage Solutions**
- › **Market trends & Innovations**





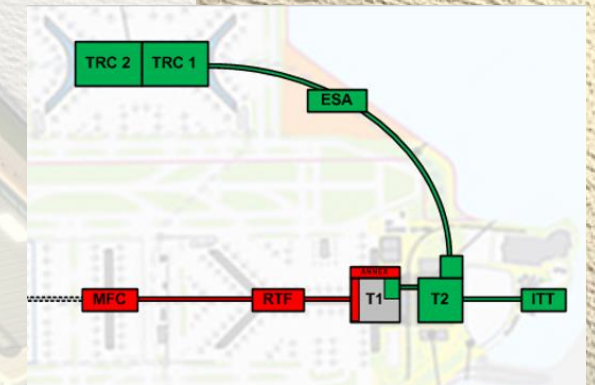
***Vanderlande Airports – reference projects***

Los Angeles TBIT and BOP2      Orlando South T      Singapore  
Hong Kong 3RS      Oslo Gardemoen ,T2      Damman IA      Muscat  
London Heathrow PT5TBS / T3      **JEDDAH**      Panama  
Paris Charles de Gaulle, new sorter Terminal M      Lima  
Oslo Gardemoen, T1      Shenzhen Bao'an International Airport  
Amsterdam Airport Schiphol, D pier  
Paris Charles de Gaulle, Terminal C&M  
Qingdao International Airport  
Beijing International airport  
Amsterdam Airport Schiphol, South and Backbone  
Ercan Airport, Cyprus  
Xi'an      JFK NTO (T1)  
Barcelona, T1  
Sydney  
Chengdu  
Taiwan Taoyuan T3  
London Heathrow T5

Leipzig-Halle  
Zürich  
Alicante

## Hong Kong International Airport - 3RS

- > Multi-Terminal high speed tunnel connectivity to connect inter-terminal
- > 30 Mil PAX/annum (Phase1)
- > BHS capacity 21,000 bags/hr
- > Conveying: 45 km RAW and 18km of ICS (mixed flow and high-speed ICS in tunnel)
- > Check-In: 216 desks and 4 transfer inputs
- > HBS: 16 std3 screening machines & 4 Customs EDS machines
- > Bagstore: 2000 positions
- > Make-up: 72 laterals and 4 carrousel
- > Arrival: 8 carrousel
- > LLC: 164 PLCs cabinets
- > Bag-ID (RFID) and CCTV consisting of 1100 cameras



# Airports Solutions for BHS, Passenger, Digital and Services

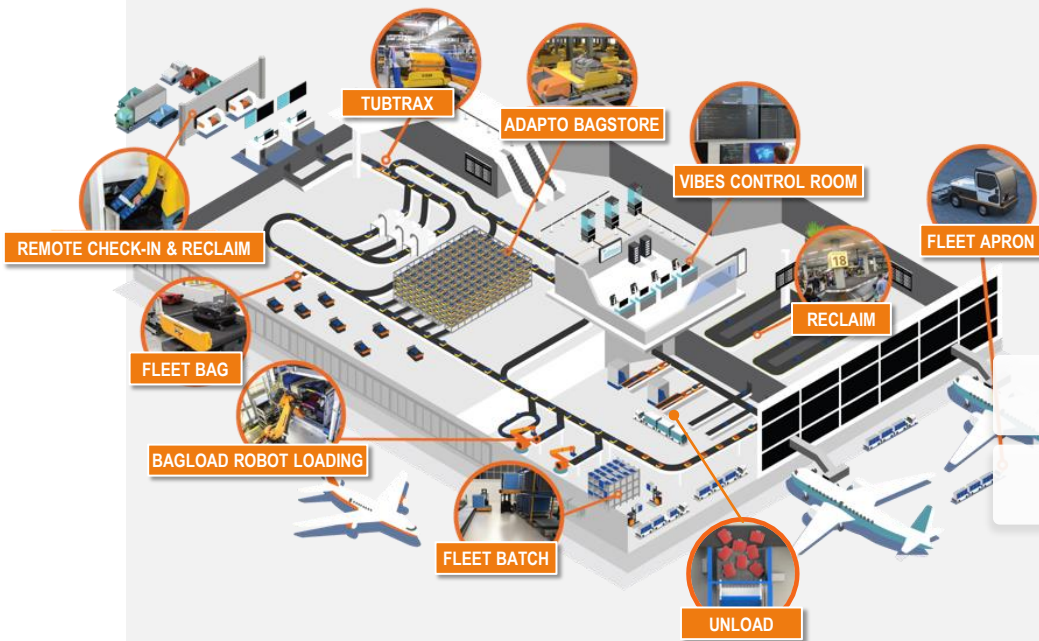
FOUR MAIN AREAS – DIGITAL SOLUTIONS COMBINING THEM INTO ONE ECO-SYSTEM



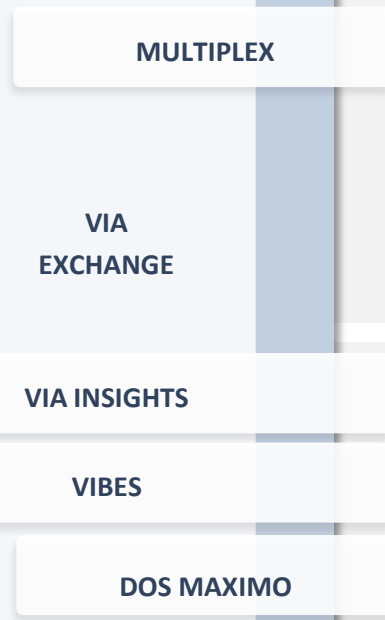
# Airports solutions

BAGGAGE AND PASSENGER SOLUTIONS CONNECTED BY VIA DIGITAL SUITE

## END-TO-END BAGGAGE SOLUTIONS



## VIA DIGITAL SUITE



## END-TO-END PASSENGER SOLUTIONS



## SERVICES



**VANDERLANDE**

***Passenger  
security***

**MOVING YOUR BUSINESS FORWARD**

## **PAX Solutions**

SUPPORTING AIRPORTS IN GIVING PASSENGERS A SEAMLESS SCREENING EXPERIENCE



*Increased throughput*



*Flexible operations*



*Optimal use of space and equipment*



*Improved passenger experience*

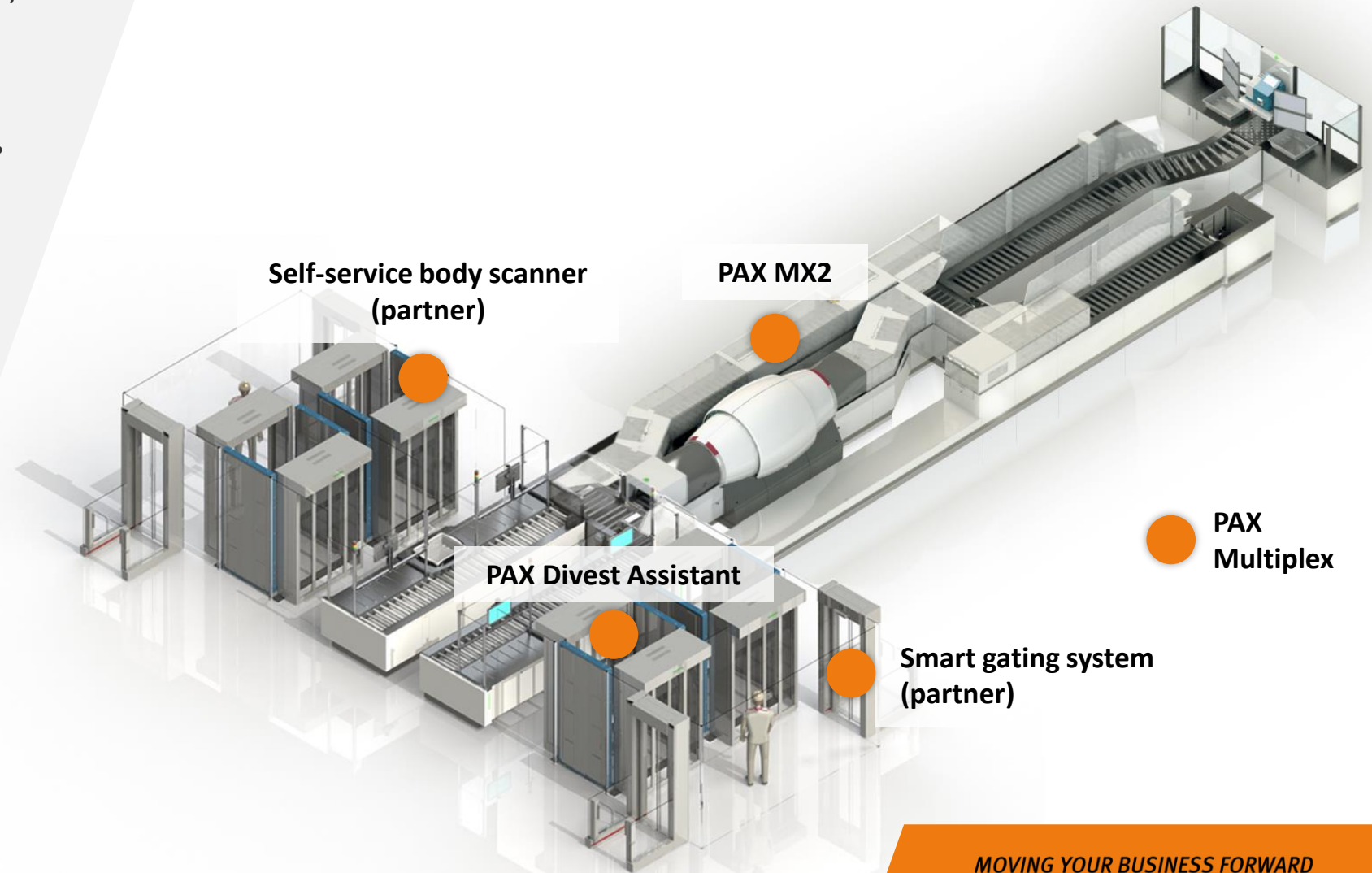


## **Towards Self-Screening**

PROJECT WITH THE US DEPARTMENT OF HOMELAND SECURITY (DHS)

*Vanderlande is currently developing a passenger self-screening concept design and prototype for the DHS as part of the Screening at Speed program*

-  **Consolidated screening steps**
-  **Improved passenger experience**
-  **Reduced labour dependency**



**VANDERLANDE**

***End-to-end  
baggage  
handling***

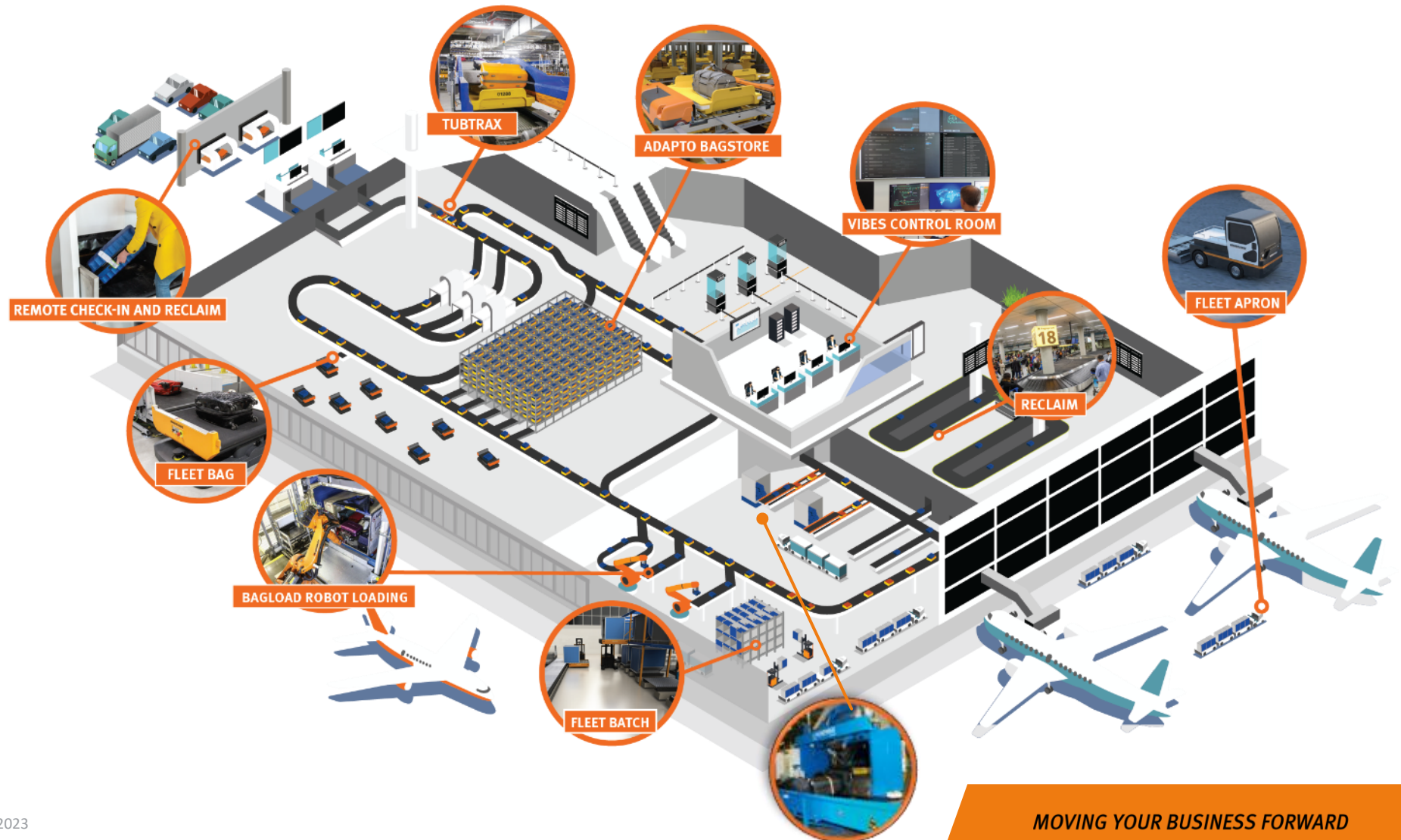
**MOVING YOUR BUSINESS FORWARD**

# Portfolio that enables End-to-end Baggage operations

COMBINATION OF EQUIPMENT, CONTROLS, AUTOMATION, DIGITALIZATION AND PROCESS

## A holistic view of the baggage journey

- › End-to-End
- › Increased levels of Automation
- › Integration of processes and data from different stakeholders



## **Baggage 4.0 vision**

NEXT GENERATION OF  
BAGGAGE OPERATIONS

*Highly automated  
end-to-end baggage  
operations with little to no  
human intervention.*



**Baggage to and from any location,  
delivered on time, every time.**



**Occurrence of unexpected events is  
greatly reduced or even eliminated**



**Little to no human intervention leading  
to reduced Total Cost of Ownership**



**Systems and processes adapt  
automatically to changing circumstances**



**Sustainable at the core; reduced impact on  
environment and improved user experience**

***Market trends  
& innovations***

# Airports Market Trends & Innovations

AUTOMATION, DIGITALISATION, SUSTAINABILITY

## Market Trends & innovations

## Impact to the industry

## VI innovations



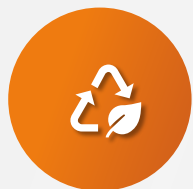
**Automation to reduce loads for handlers and reduce resource dependency**

*Opportunities though evolving robotics will accelerate acceptance of automated applications in the market*



**Digitalization: Data Analytics & Ecosystems**

*Consolidation of multiple data into one ecosystem / data hubs.  
Innovative Life Cycle Service propositions using AI & Data Analytics*



**Sustainable Business**

*Necessity to adopt and expand upon is recognised by industry*



| Planet                       | Prosperity              |                      | People                       |
|------------------------------|-------------------------|----------------------|------------------------------|
| <p>Zero Carbon Footprint</p> | <p>Circular Economy</p> | <p>Good Business</p> | <p>Fulfilling Experience</p> |

## **FLEET autonomous vehicles – application areas**

FOR INDIVIDUAL BAGS OR AS PART OF INTEGRATED END-TO-END BAGGAGE HANDLING



**FLEET Bag**

- › Transports **individual bags** inside the baggage hall
- › Supports secondary (low volume, high flexibility sortation) processes, such as exception handling



**FLEET Batch**

- › Transports **batches of bags** within a load unit (ULD or non-aircraft container) **inside the baggage hall**
- › Supports the make-up and break process and provides inter-terminal transportation



**FLEET Apron**

- › Transports **batches of bags to and from aircraft stands on the apron.**
- › Supports the turnaround and transfer process, provides arrival, departures and tail-to-tail transportation

## Key Challenges in Baggage (Un)Loading

REDUCE MANUAL LIFTING, INCREASE STAFF EFFICIENCY, REDUCE FOOTPRINT



### Reduce manual lifting of baggage

- › Increase automation will reduce all manual lifting of baggage and improve ergonomics.
- › Creating sustainable, future proof and high-quality employment.



### Efficiency of Staff

- › Due to the scarcity of labor an increase of productivity is necessary.
- › Increasing volumes need to be processed by less staff.
- › Staff is scarce.

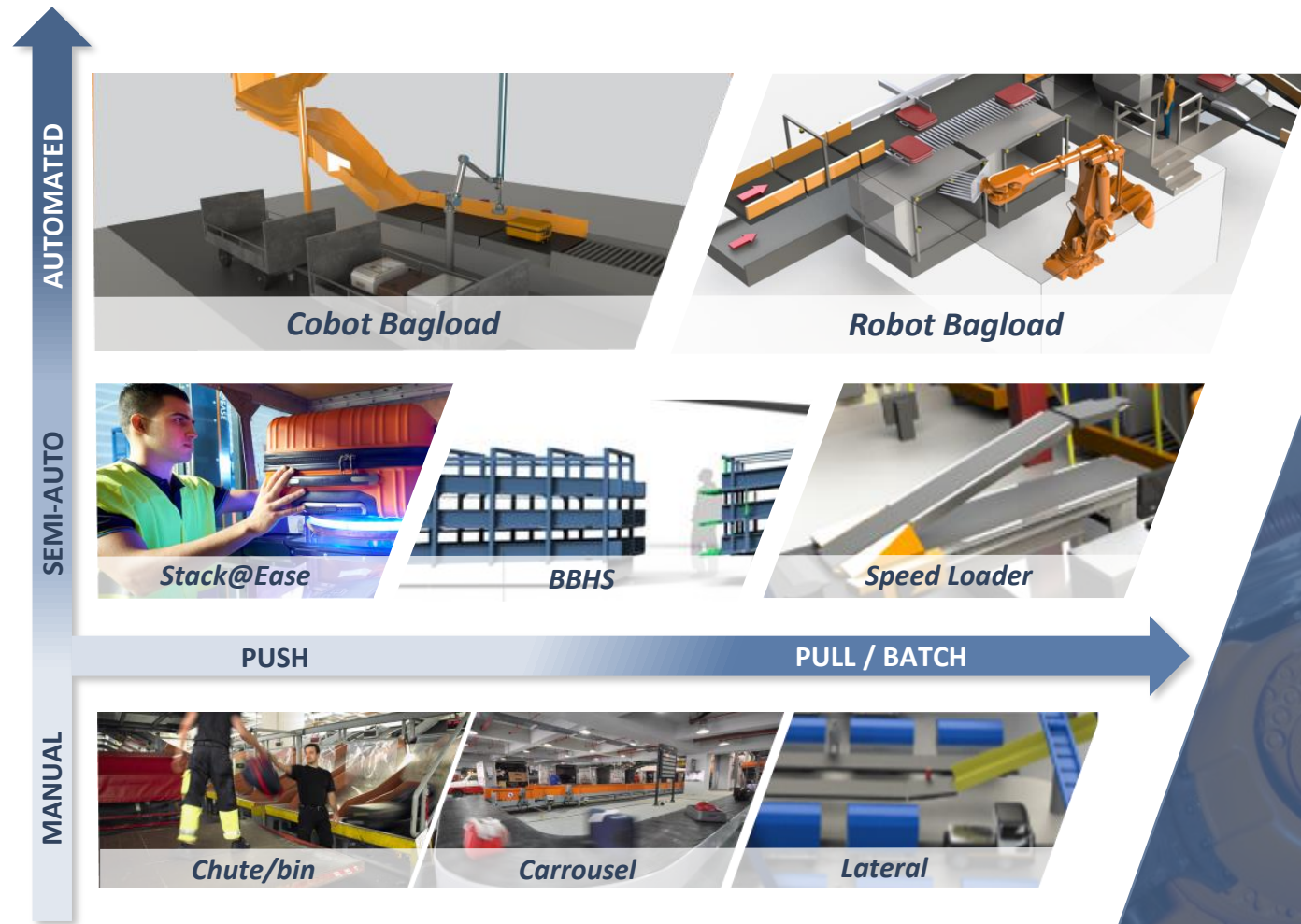


### Reduction of BHS footprint

- › Airport shopfloor space is constrained, productivity per m<sup>2</sup> needs to increase.
- › Reduction of idle time to increase efficiency in make-up & unloading.

# Load Modules

## BAGGAGE LOAD SOLUTIONS POSITIONING



# Next Generation Robotics

## AUTOMATED ULD LOADING BAGGAGE



***Vision***  
***World Modelling***



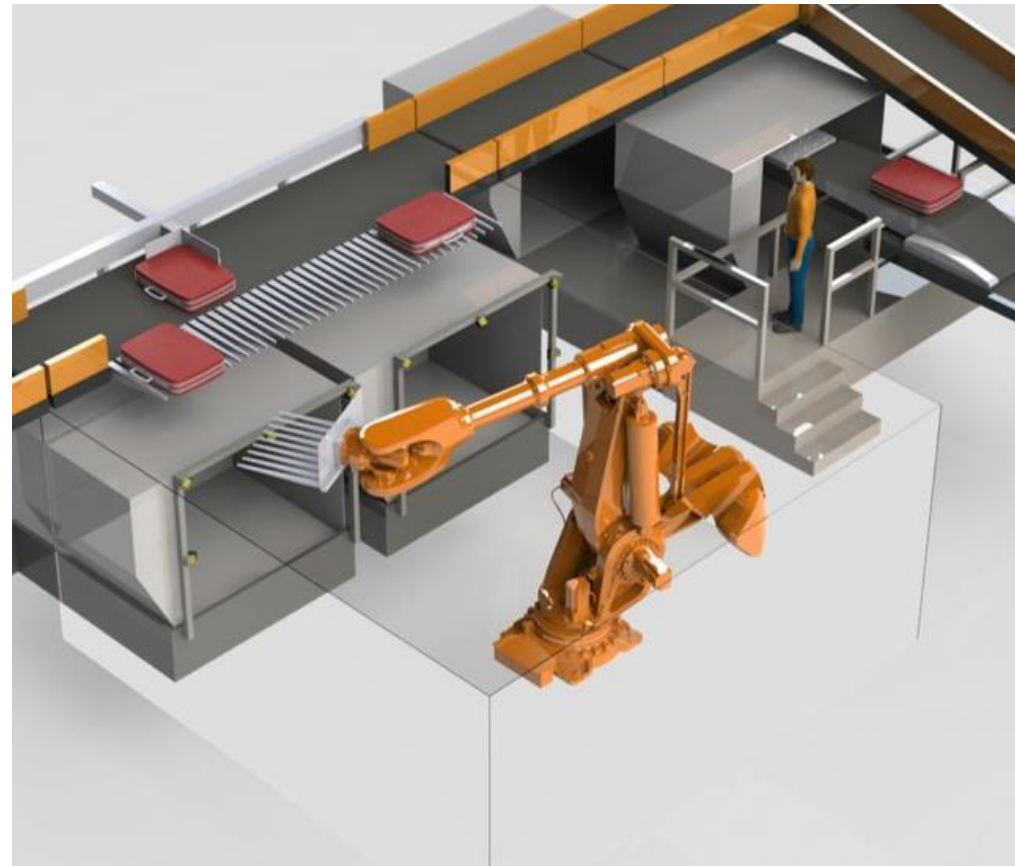
***Intelligence***  
***Load Logic***



***Controls***  
***Motion Planning & Control***



***Manipulation***  
***Robot & Gripper***



- › Increase speed (=productivity)
- › Reduce manual intervention (=supervision labor)
- › Increase quality (=higher fill rates)

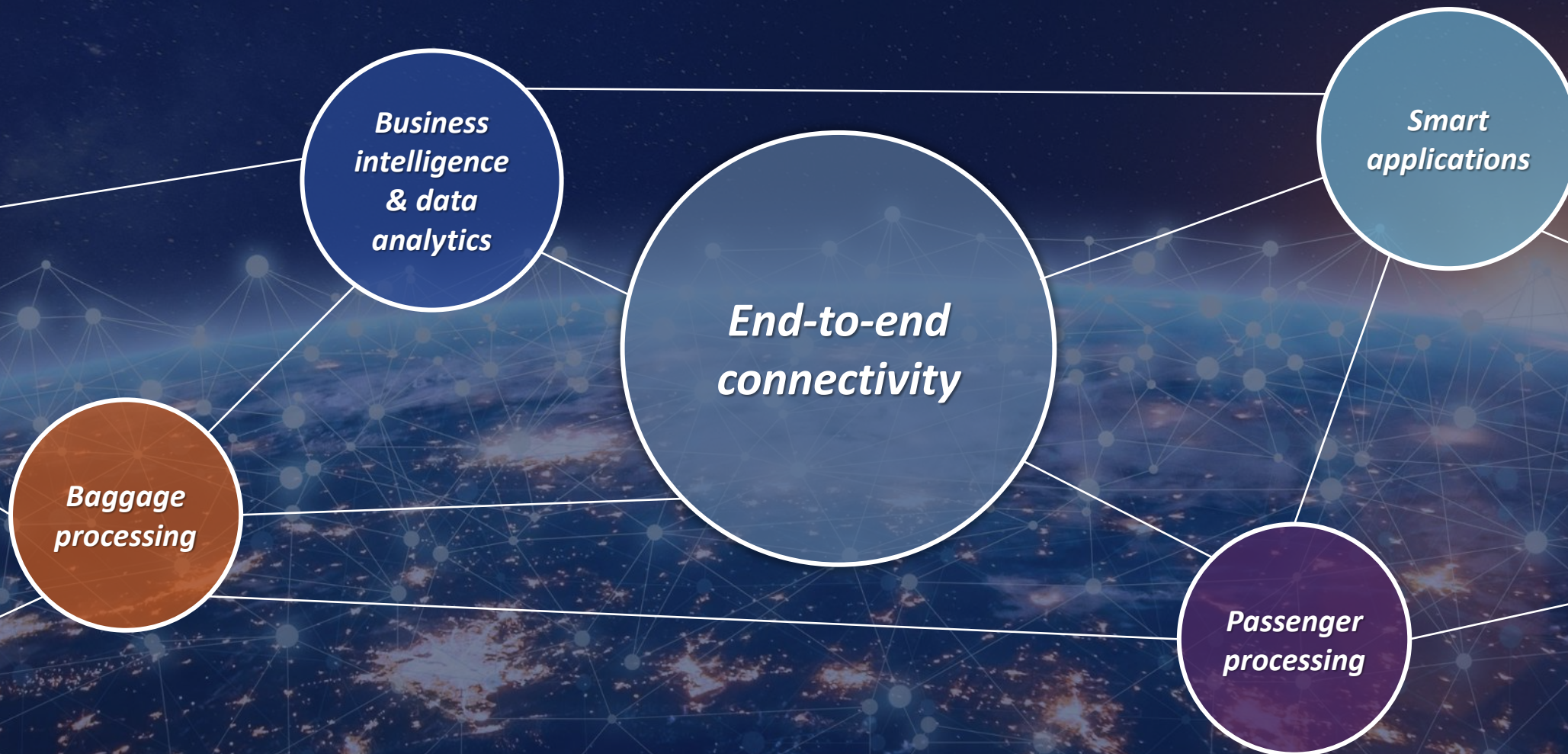
# End-to-End baggage solutions enable space & costs reductions and improve ergonomics

WITH BATCHING AND AUTOMATION



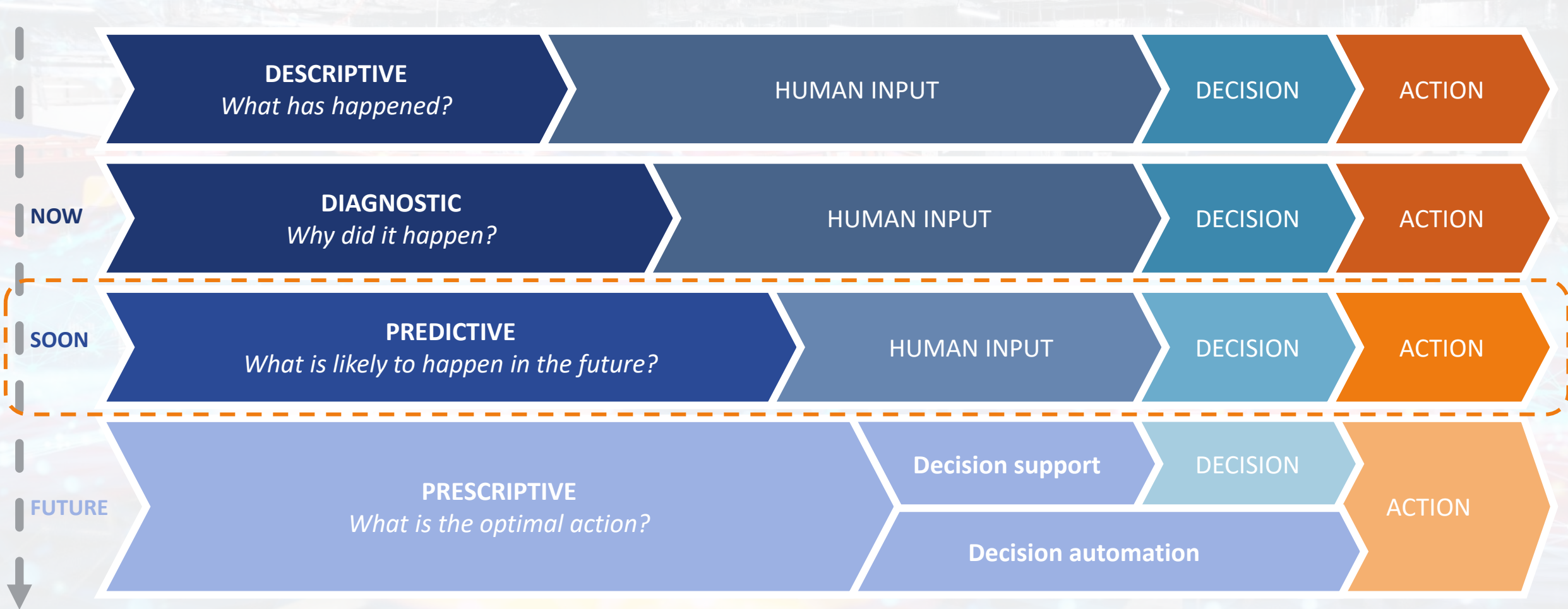
## **Digital Solutions: Vanderlande's approach**

REACH END-TO-END OPTIMISATION THROUGH CONNECTIVITY & SMART USE OF DATA



# From descriptive to prescriptive – on equipment as well as processes

## STEPS TOWARDS LIGHTS-OUT BAGGAGE OPERATIONS



# Condition-based maintenance

IN PARTNERSHIP WITH SCHIPHOL



300 sensors provided by Schiphol



Measuring temperature and vibrations regularly



Collecting data for around 11 months



Reduced mishandled bags

26 %

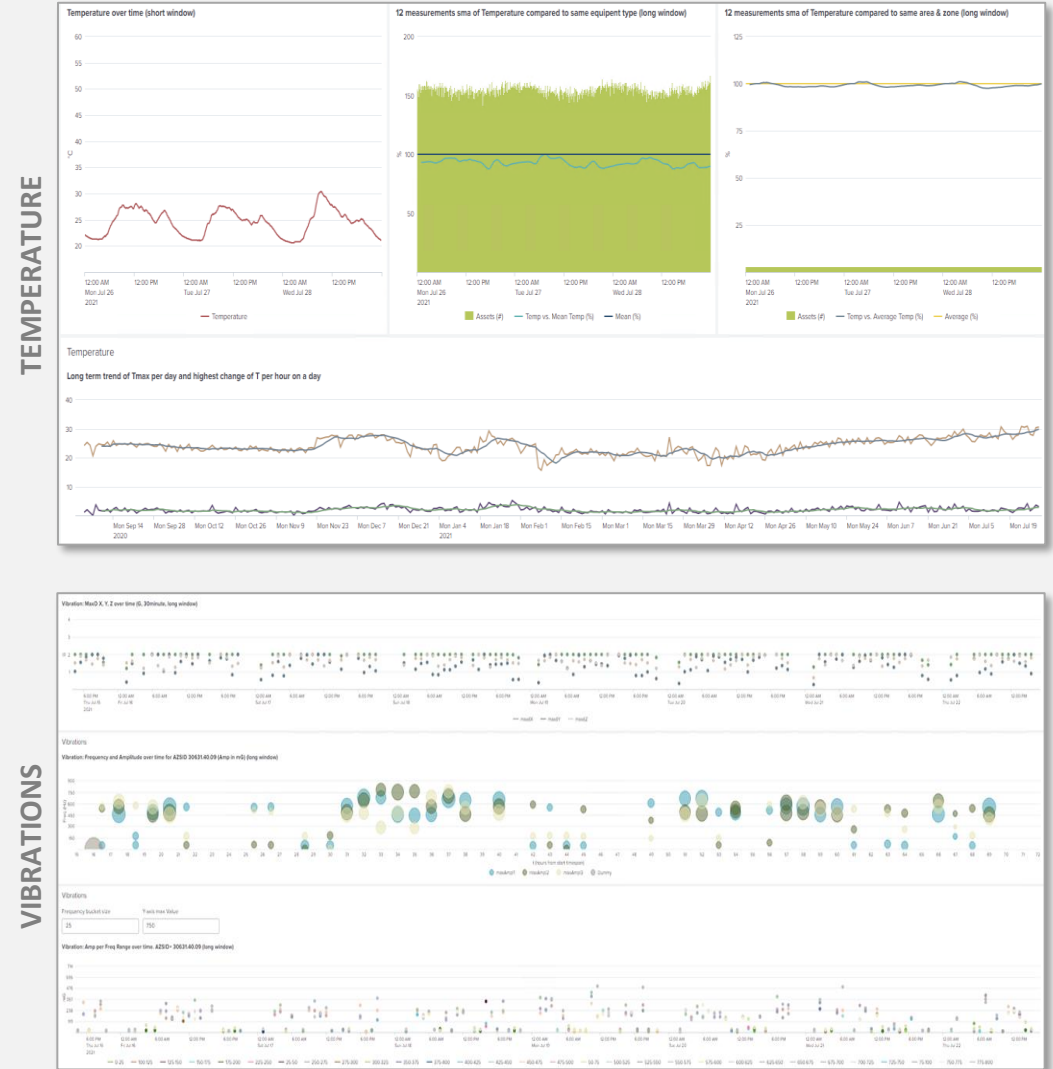
Of actual outages could be predicted

83 %

Of the triggered inspections abnormalities were found

Schiphol

VANDERLANDE



# Vanderlande Sustainability Framework

PROVIDES CLEAR GUIDANCE AND FOCUS ON SUSTAINABILITY GOALS

*Commitment to Net Zero: 100% renewable energy usage in 2025 at HQ in Veghel Netherlands. Globally in 2030.*



Vanderlande has defined four core areas in which we will work in order to successfully achieve a strong triple bottom line, Planet, Prosperity and People

- **Zero carbon footprint:** we will be net zero carbon by 2040, 10 years ahead of the Paris Agreement.
- **Circular Economy:** we will be a regenerative company in 2040 as part of our commitment to the acceleration of a circular economy
- **Good Business:** we have strong business ethics and doing good business is part of our daily work
- **Fulfilling experience:** we put people first: we foster environments to protect the well-being of Vanderlande's stakeholders, and promote education, diversity and personal development

*Stack@Ease and Robotic Bagload*

*Material Tubtrax carriers 100% recyclable*

*Thank you for your attention*



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***MOVING YOUR BUSINESS FORWARD***

**VANDERLANDE**

***Digital  
solutions***

***MOVING YOUR BUSINESS FORWARD***

## ***VIA Digital Suite***

PLATFORM OF VANDERLANDE'S SOFTWARE SOLUTIONS

***VIBES***

Baggage Controls

***VIA Insights***

Data Analytics

***PAX Suite***

Passenger Security

***VIA Exchange***

Connectivity



Platform of software solutions designed to ensure stability, optimise operations, enhance passenger experience, and contribute to the achievement of sustainability goals.

# Complete Baggage Handling Solutions package

*Reliable partner for value-added automated baggage handling solutions  
Broadest range of in-house innovative products, intelligent software  
and life-cycle services*



Equipment



Intelligent Software



Life Cycle Services

# Vanderlande - company profile

VISION: WORLDWIDE LEADER IN SUSTAINABLE AUTOMATED LOGISTIC SOLUTIONS



Global  
**market leader**



Established since  
**1949**



**>9,000**  
employees



› Innovative systems



› Intelligent software



› Life-cycle services



**AIRPORTS**  
600 airports including  
12 of the world's **top 20**



**WAREHOUSING**  
Many of the **largest** global  
**e-commerce players**




**PARCEL**  
**>52 million** parcels  
sorted **every day**



# Efficient operations with the pull process

HOW IT WORKS

## Conventional process

 3 hour loading



Bag drop



Make-up

# Efficient operations with the pull process

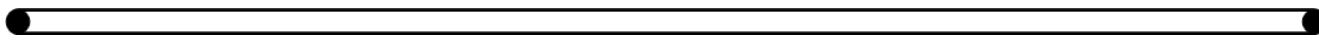
HOW IT WORKS

## Conventional process

 **3 hour loading**



Bag drop



Make-up

## Pull process

 **1 hour loading**



Bag drop



ADAPTO Bagstore



Make-up