

What does the world of Material Handling look like in 10 Years

Vincent Kwaks – CTO Vanderlande

TOPICS

- **Vanderlande - Introduction**
- **How did we look to 2020 5 years ago?**
- **What does the world in 10 years look like?**
- **And what is your view – Let's discuss!**

> Vanderlande - Introduction



> How did we look to 2020 5 years ago?

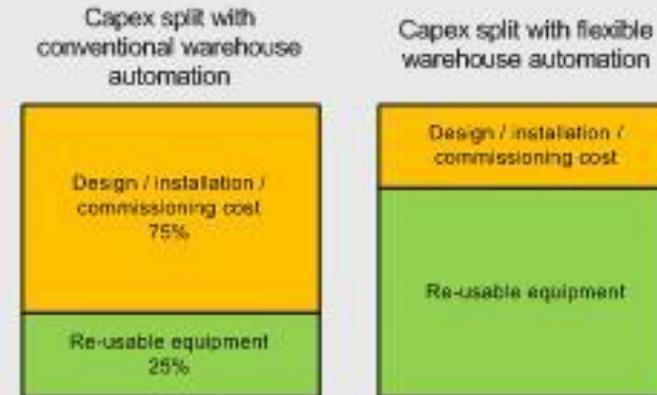


2020 plans in 2010

- Towards 100% automation
- Supply Chain becomes Data Chain
- Any time, anywhere delivery
- Automated Item Picking

DC AUTOMATION

➤ Portability is a financially issue



➤ Portable solutions enable leasing of equipment

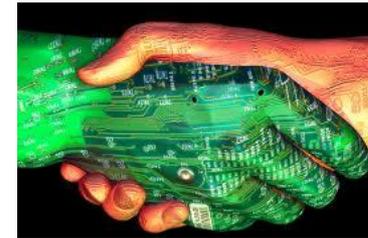
➤ Optimally, portability would be given by platforms supported by multiple vendors.

> What does the world of Material Handling look like in 10 Years?

**CHANGE
AHEAD** 

Global trends will drive logistical complexity and flexibility (1/2)

Impact on logistics



The growth of e-commerce

- Fast order fulfilment
- Individual items
- Products are in stock, without excessive safety stock
- Returns
- Push to pull
- From planned to instant delivery

Relentless Competition

- Third-party logistics
- Price
 - Shorter lead times
 - End-to-end visibility
- Service
 - Respond to changes in delivery location and time

Mass personalisation

- Any time, Anywhere any way
- Diverse set of order and distribution channels
- Rising customer expectations
- Solution As A Service

Urbanisation

- Challenges for last-mile distribution facilities
- Home delivery
- Smaller quantities
- Higher variety of products
- Infrastructure and legislation restrictions

Humanising technology

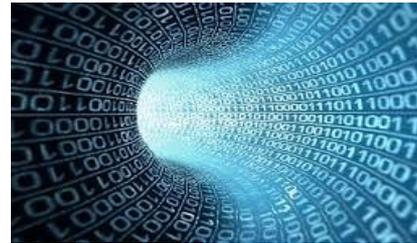
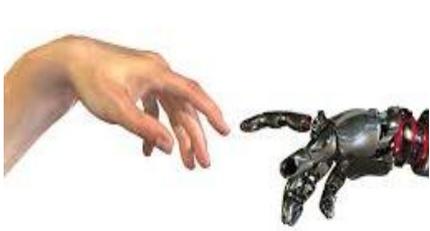
- Virtual/ augmented reality
- Ergonomic design
- Location-based services
- Wearable computing
- Social acceptance of technology

Value chain

- Integration of the value chain
 - Who manages the grid?
- Client might be potential future competitor
- Responsiveness and flexibility

Global trends will drive logistical complexity and flexibility (2/2)

Impact on logistics



Robotics and automation

- Capabilities increase and costs decrease
- Autonomous control and distributed intelligence
- Self driving/ flying
- Miniaturization

Sensors and the internet of things

- Real time and remote control
- Wireless
- (predictive) Warnings of problems
- Optimizing routing and delivery decisions

Big data and predictive analytics

- Data analysis of massive quantities of data
- Data mining
- Data visualization
- Better decisions in logistics and operations

The changing workforce

- Attracting and keeping an adequate workforce
- Different workforce and skills than today
- Innovation of collaboration and workplace

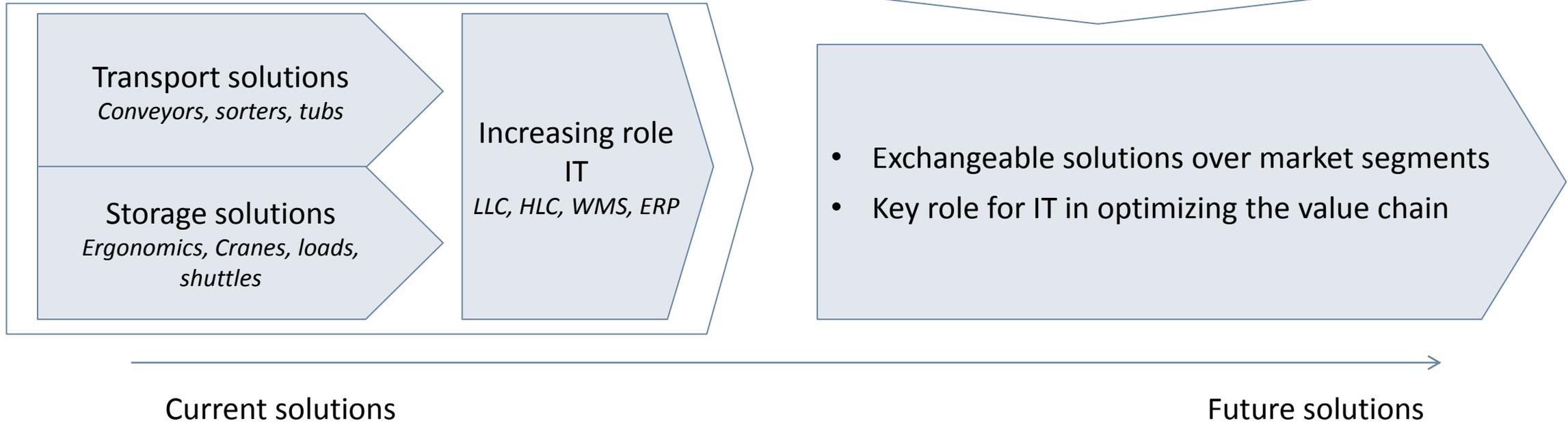
Circular economy

- Local production
- Usership versus ownership
- Waste management
- Returns
- Standardization for smaller units

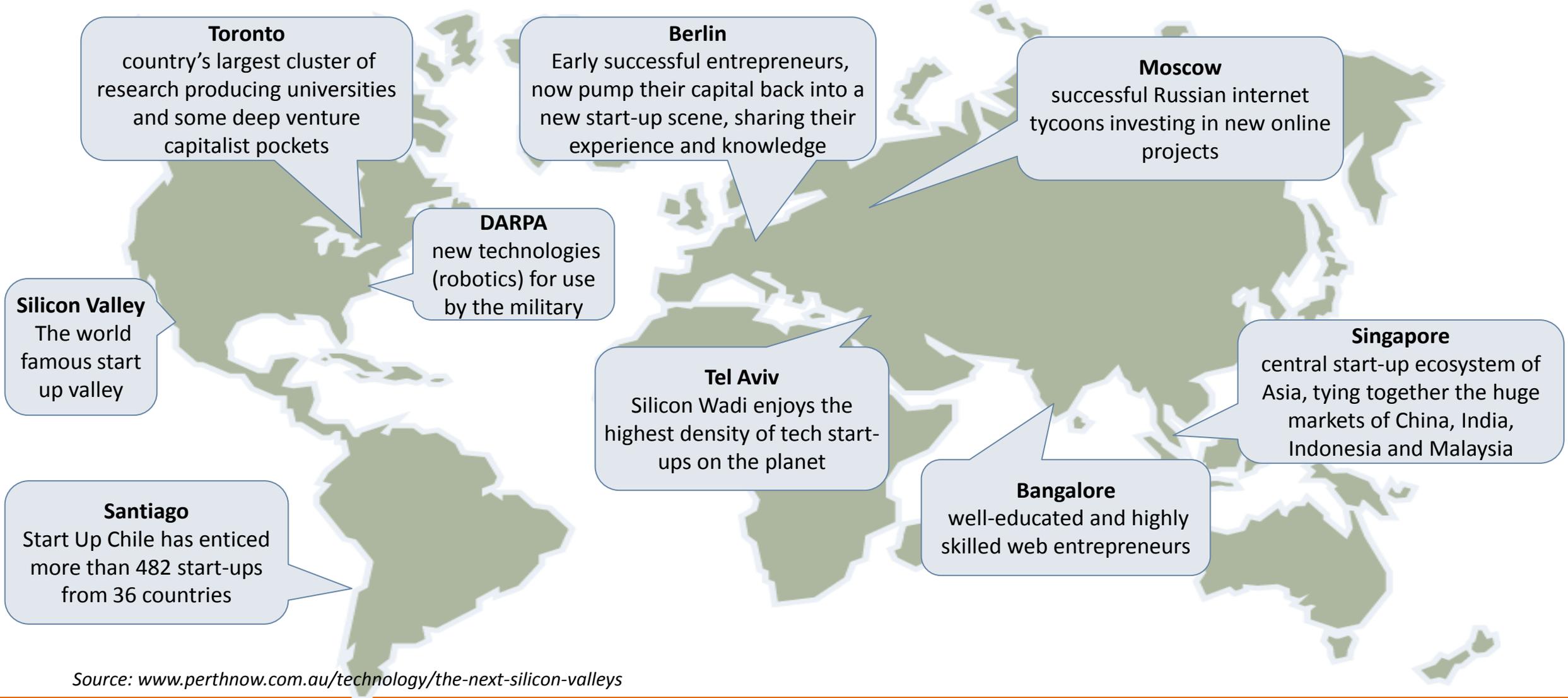
IT and new technologies become key in future solutions for all market segments

Relatively new technologies most relevant for our business

				
Robotics	Battery/ energy	X-perience	Big Data	Algorithmic

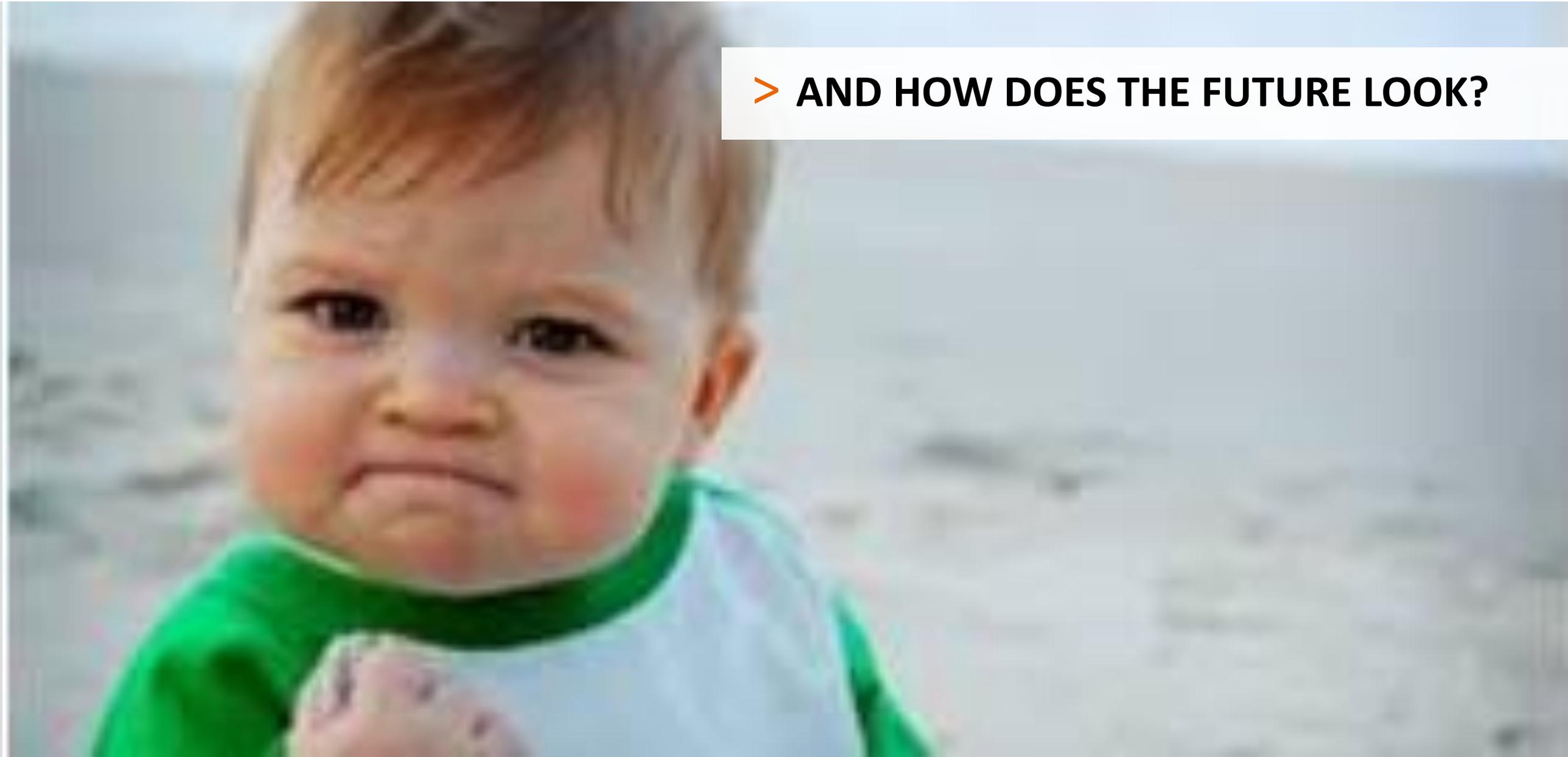


TECHNOLOGY HOTSPOTS & ECOSYSTEMS – WHERE IS THE FUTURE CREATED?



Source: www.perthnow.com.au/technology/the-next-silicon-valleys

> AND HOW DOES THE FUTURE LOOK?





> NEED FOR AUTOMATION REMAINS!

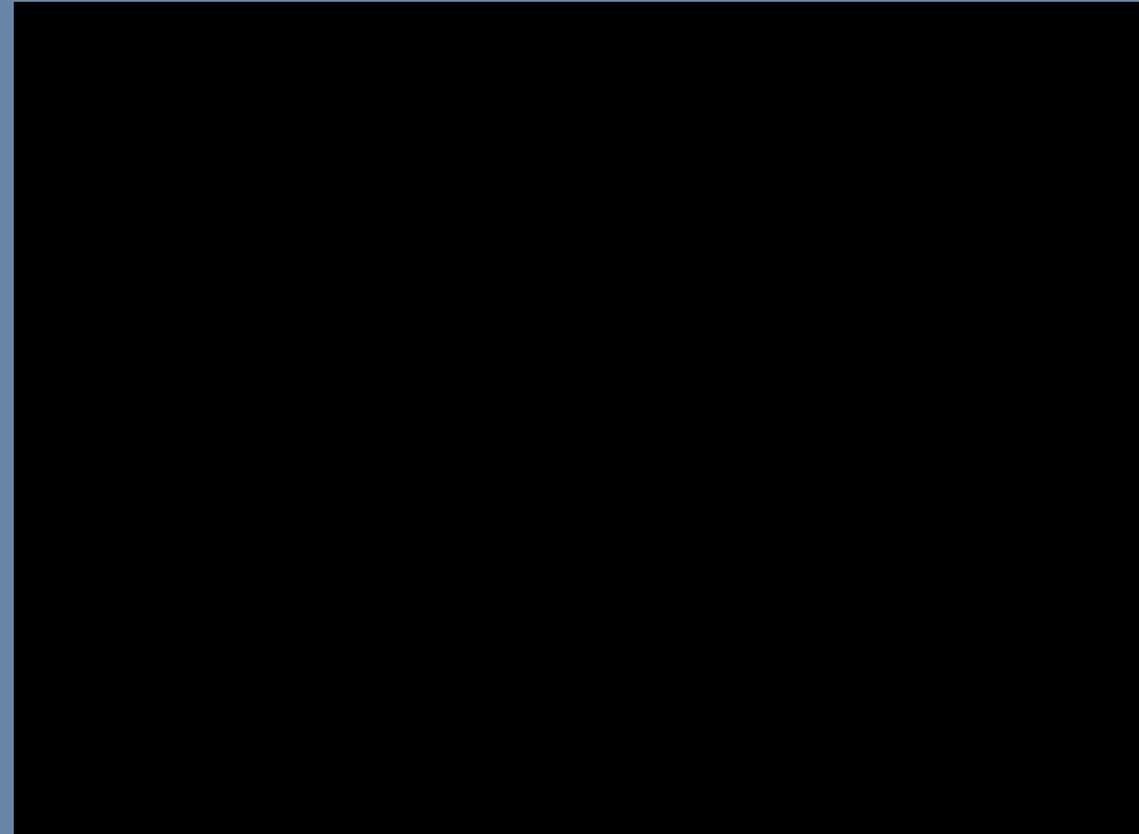
> BUT ADAPTABILITY AND SCALABILITY BECOME KEY



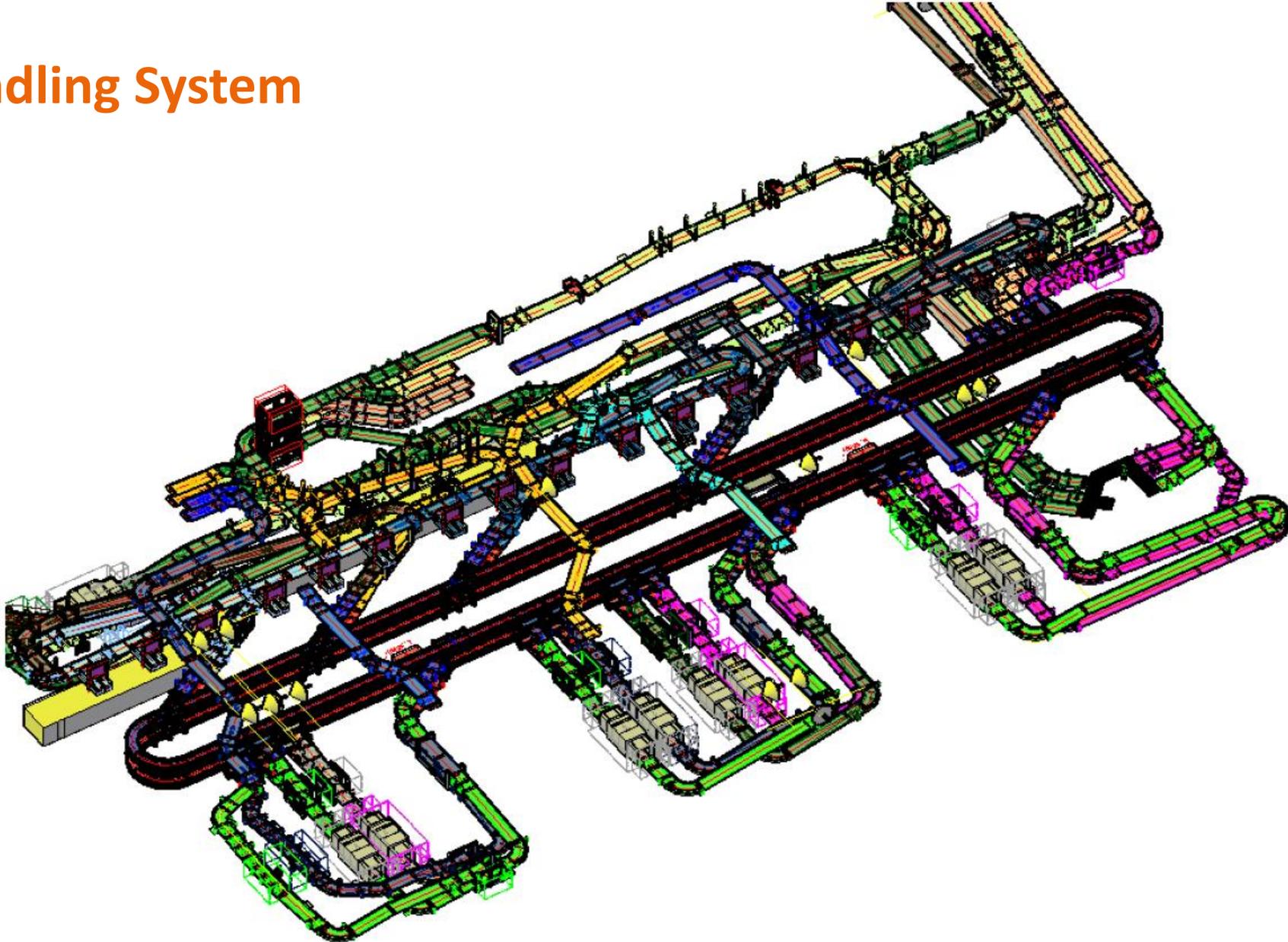
> ADAPTO, EXPERIENCING THE FUTURE TODAY



> CHOICES: AUTONOMOUS OR CENTRALISED CONTROL?



A typical Baggage Handling System



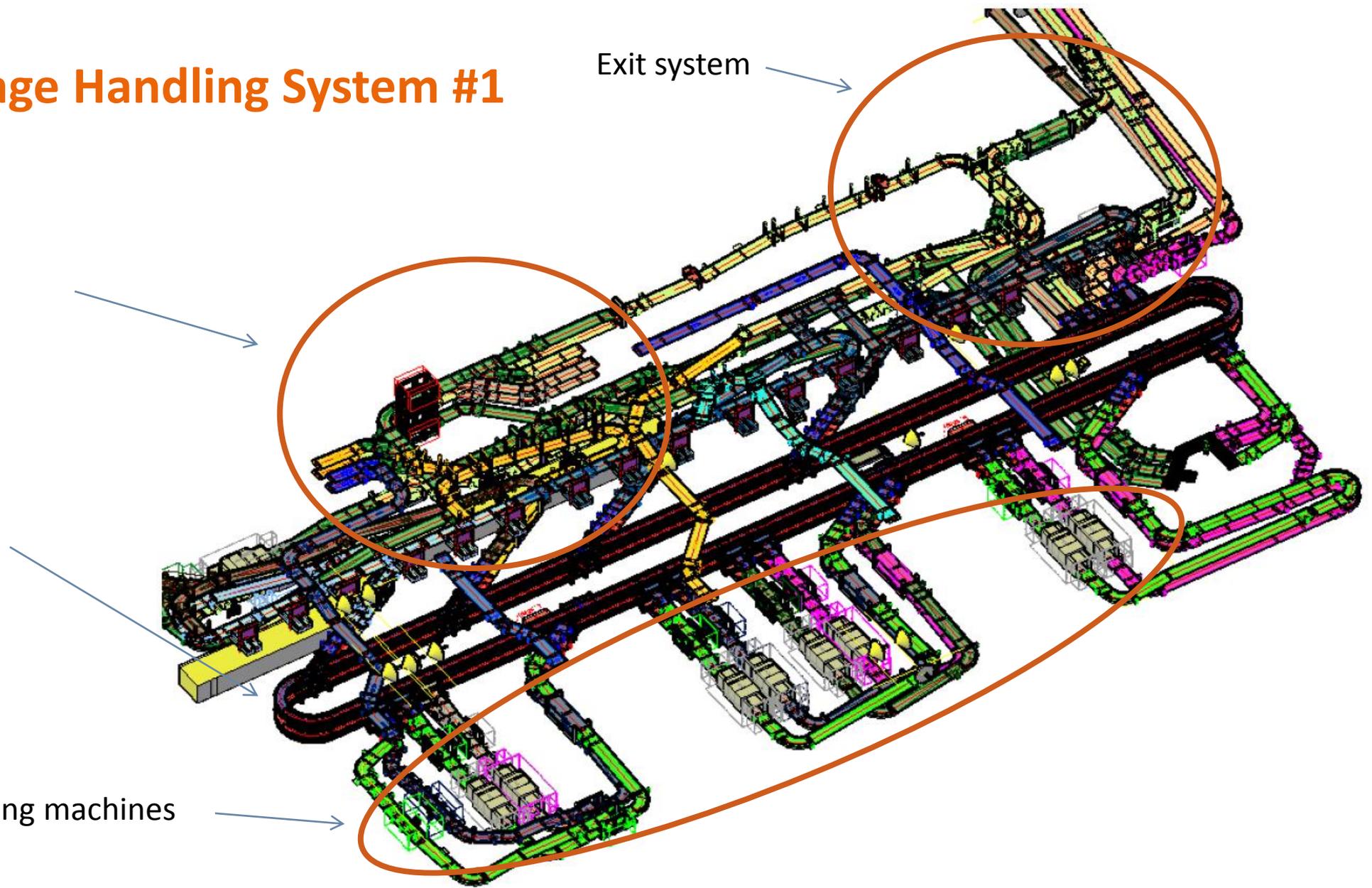
A typical Baggage Handling System #1

Exit system

Supply system

2 Tilt Tray loopsorters for redundancy

X Ray screening machines



Alternative

Keep the building, keep the load.

Forget the rest.

What could such a system look like?

Limitations and questions:

uniform or standard vehicles (re-use)

What about failure recovery and redundancy?

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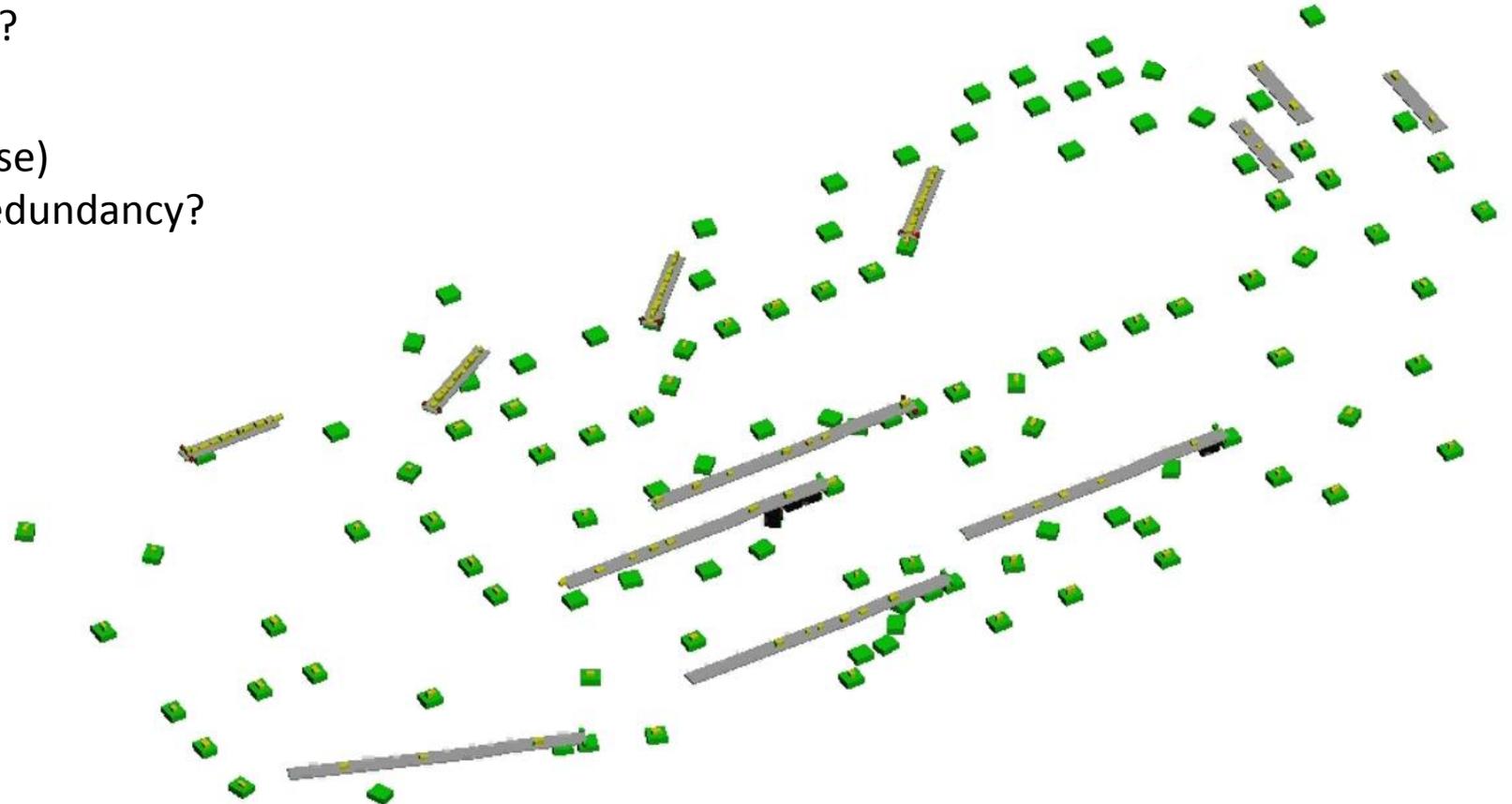
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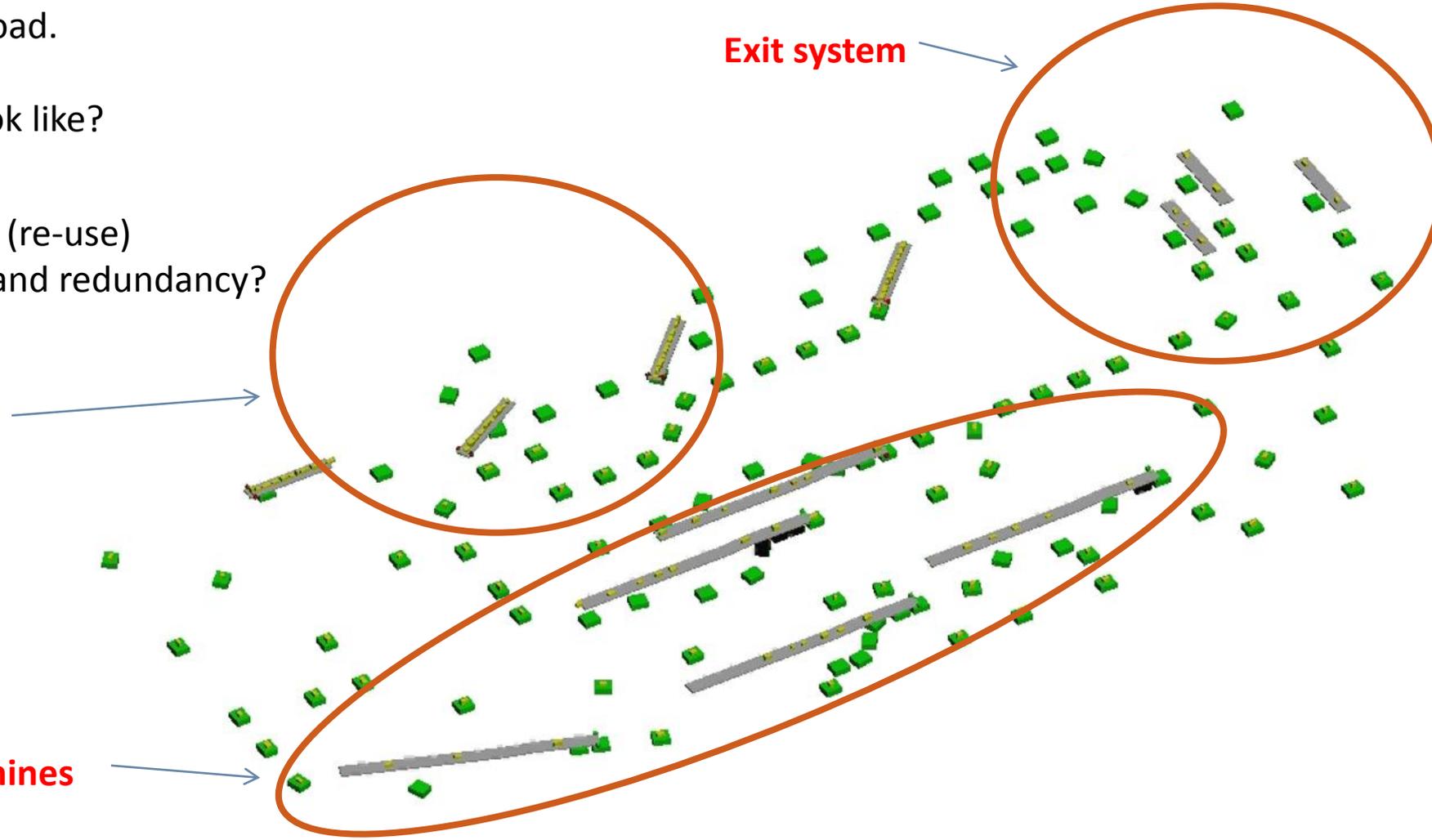
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Supply system

Exit system

X Ray screening machines



FINDING

- autonomous vehicles
 - superior robustness and scalability
 - current state-of-the-art is low vehicle density
 - high vehicle density applications not yet fit for use
- until such time
 - traffic control for warehouse automation (Adapto)
- now cost directly related to Vehicles typically 30 to 40 %
 - starting at lower capacity possible
 - standard re-useable infrastructure to come



Robotics



Battery/
energy



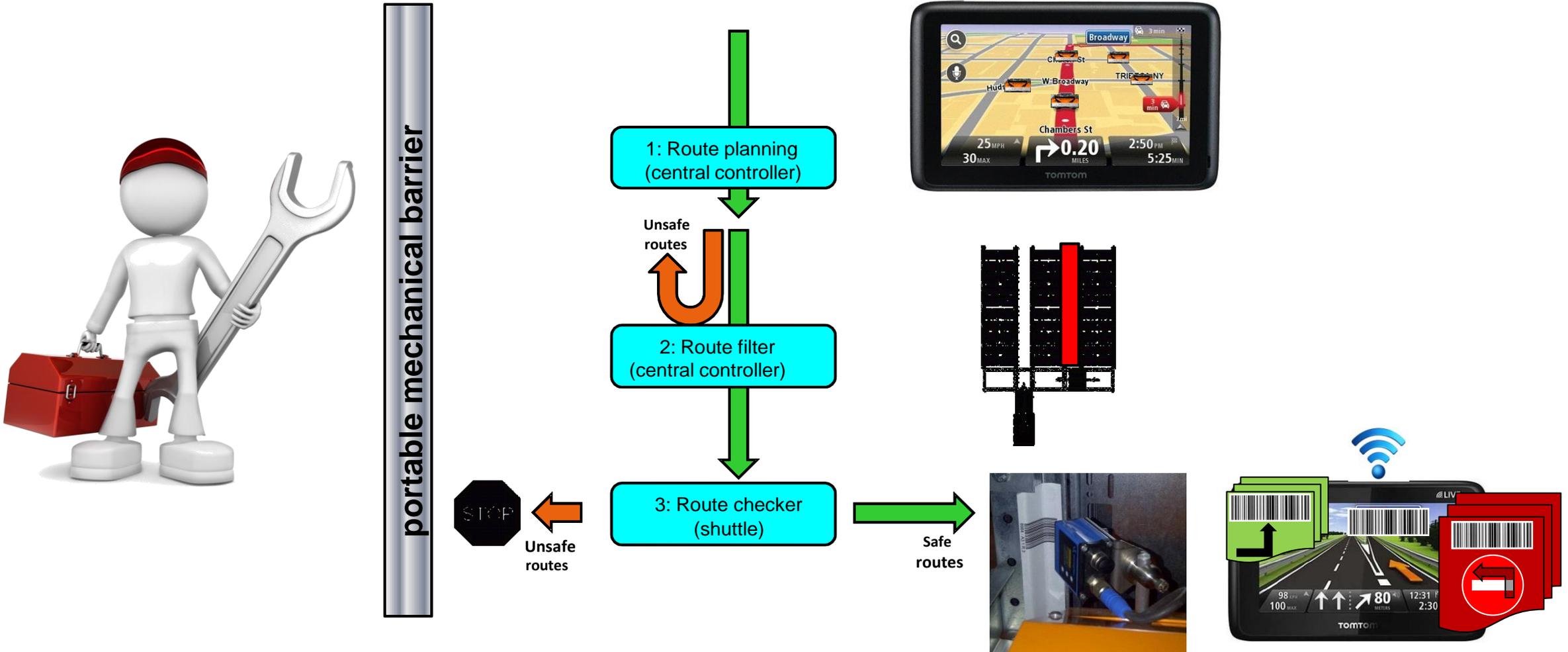
Algorithmic



> CHOICES: MACHINE AND OPERATOR SAFETY



ADAPTO machine and operator safety



FINDINGS

- Knowledge development and experience build up to
 - Develop effective and practical solutions
 - Fact finding and evidence building
 - Awareness creation with Health and Safety authorities and Notified Bodies



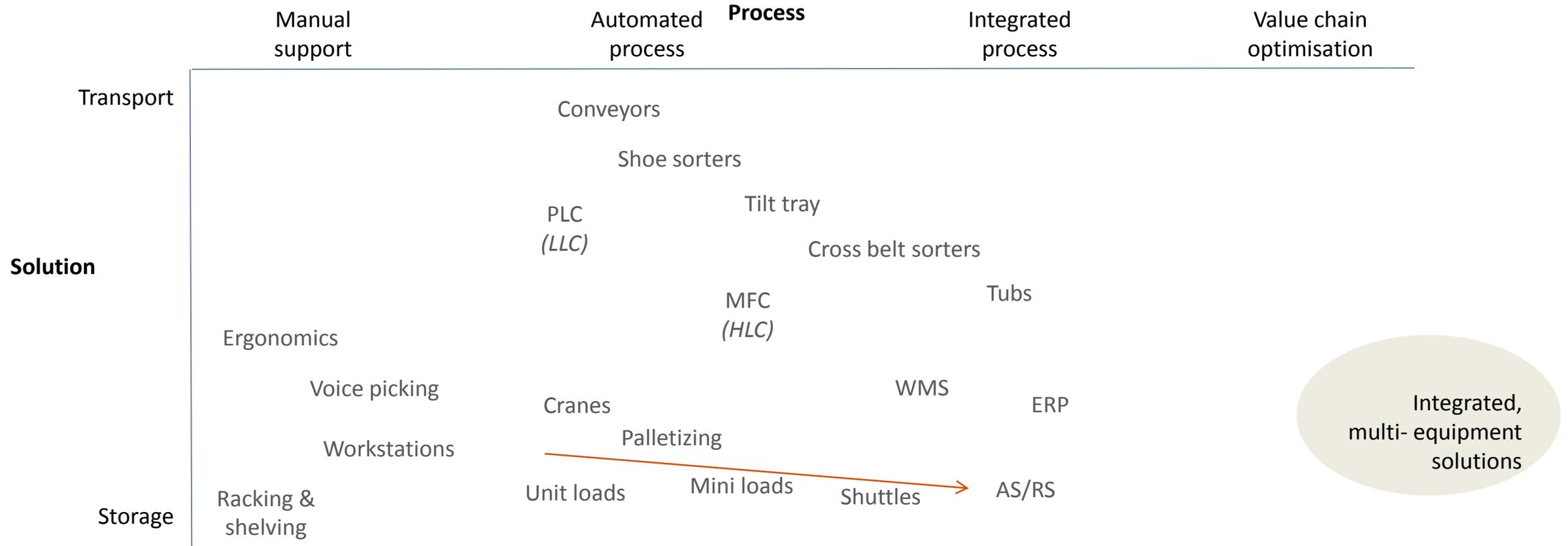
Robotics



X-perience



Material Handling Systems in 2025 are fully scalable solutions build from a limited set of re-useable components



- Integrated solutions are developed by combining mechanisation (transport and storage) and automation
- IT becomes from a linking pin between equipment, the added value factor in the solution
- Automated handling solutions become more alike

- Transport based solutions
- IT
- Storage based solutions

> **YOUR VIEW ON THE FUTURE?**



VANDERLANDE
