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SUPPLY CHAIN OF THE FUTURE

IMPACTS ON THE WORKFORCE

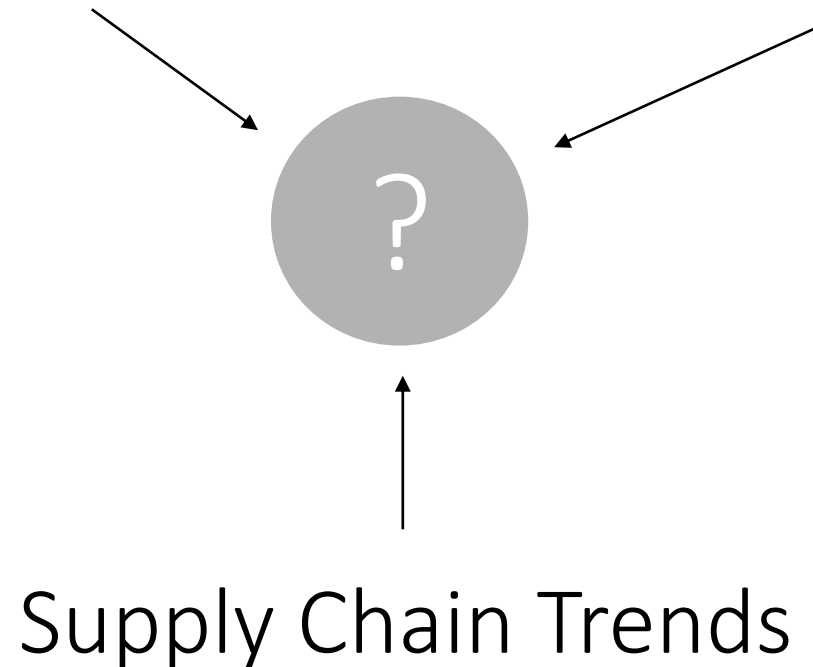Michael Felbinger / Royden Edwards   March 2020

What will impact the warehouse?

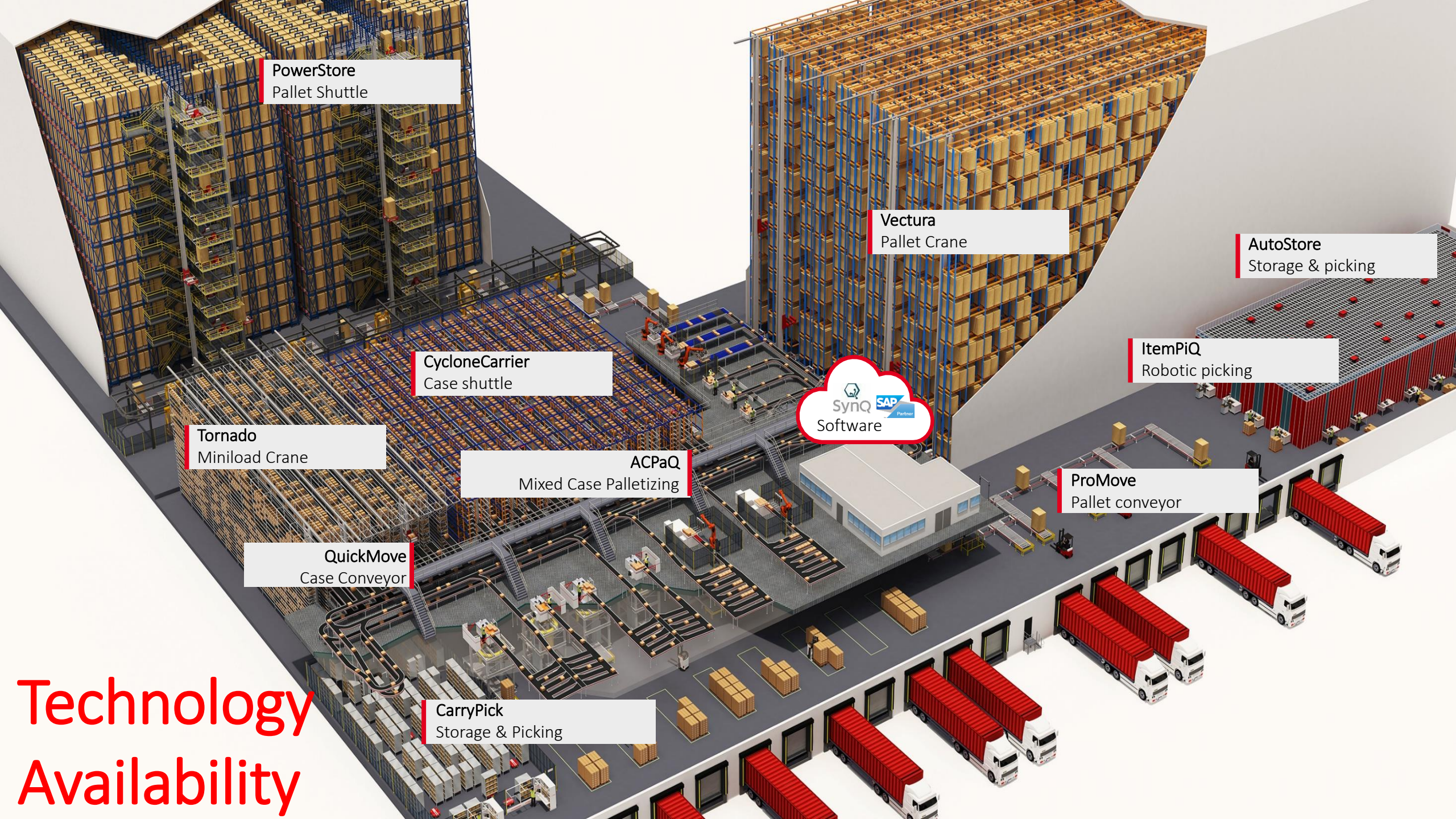Socio-Economic Trends

Technology
Development

?

Supply Chain Trends

Supply Chain Trends

- Urban distribution centers
- 3D printing
- ~~Same day delivery,~~
- Next hour delivery
- Individual manufacturing
- Batch size one
- Return logistics
- Seamless distribution

THE LOGISTICS TREND RADAR

High: Creates new (potentially disruptive) ways of doing business

Low: Provides incremental improvement opportunities

Social & Business Trends

Technology Trends

- Supergrid Logistics
- Logistics Marketplaces
- Self-driving Vehicles
- 3D Printing
- Batch Size One
- Anticipatory Logistics
- Internet of Things
- Robotics & Automation
- Unmanned Aerial Vehicles
- Shareconomy Logistics
- On-demand Delivery
- Cloud Logistics
- Self-learning Systems
- Smart Energy Logistics
- Omni-channel Logistics
- Big Data
- Augmented Reality
- Grey Power Logistics
- Fair & Responsible Logistics
- Bionic Enhancement
- De-stressing the Supply Chain
- Convenience Logistics
- Low-cost Sensor Technology
- Digital Identifiers
- Multi-purpose Networks
- Tube Logistics

Relevant in < 5 years

PowerStore
Pallet Shuttle

Vectura
Pallet Crane

AutoStore
Storage & picking

ItemPiQ
Robotic picking

CycloneCarrier
Case shuttle

SynQ
SAP Partner
Software

Tornado
Miniload Crane

ACPaQ
Mixed Case Palletizing

ProMove
Pallet conveyor

QuickMove
Case Conveyor

Technology
Availability

CarryPick
Storage & Picking

The Front Line of Change – The Supply Chain

- Key interface between a company, its partners and customers.

- Swiftly impacted by changes in markets and business models.

- At the nexus of demographic and technological changes.

- Its inherently distributed nature increases the challenges — and benefits — of connectivity and technology management.

- This unique position means the supply chain must simultaneously adapt to digital transformation initiatives and shifts in consumer behavior and demographics.

- Key to its ability to accomplish this is intelligent automation and process integration.

The Next Phase in the Evolution of the Warehouse

- For years warehouses were largely supported by manual labor.

- As SKUs increased and the need for speed and efficiency grew, warehouses entered mechanization.

- Prone to long deployment times and fixed nature, these systems were unable to adapt to changes in product mix or market demand.

EVOLUTION OF THE WAREHOUSE

Manual
Labor-Intensive, Limited Number of SKUs, Limited Throughput

Mechanized
Capital-Intensive, Inflexible, High Throughput

Automated
Data-Intensive, Flexible, Robotic
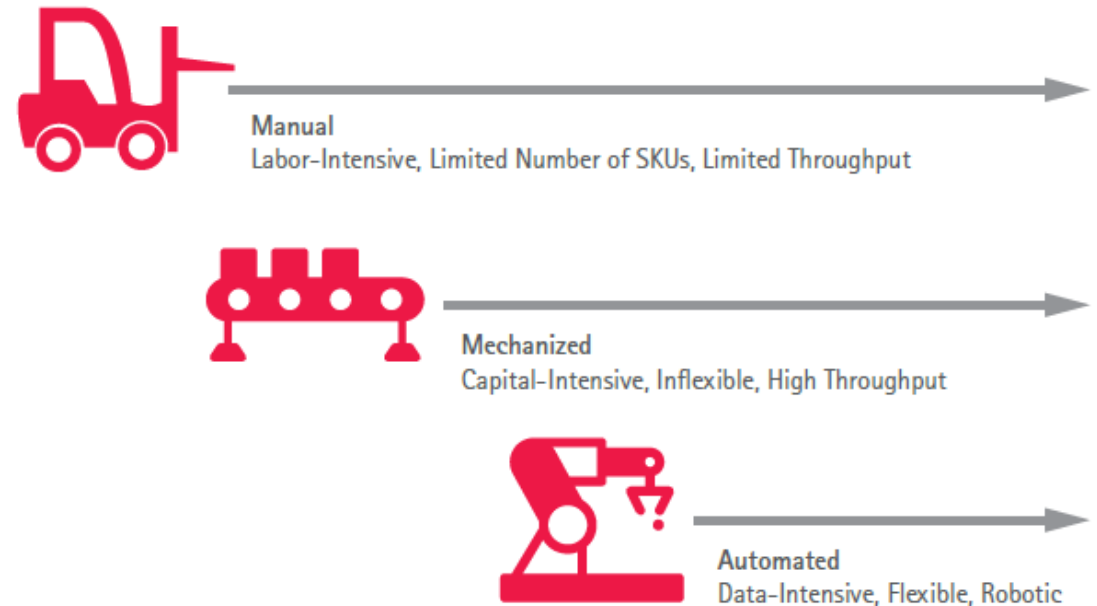
The Next Phase in the Evolution of the Warehouse

- The next phase has already begun and is marked by automation that focuses on intelligent systems.

- Data-Driven, Flexible and Robotic
  - The power of data is only beginning to be harnessed.
  - The key to harnessing that power is the warehouse management execution software.

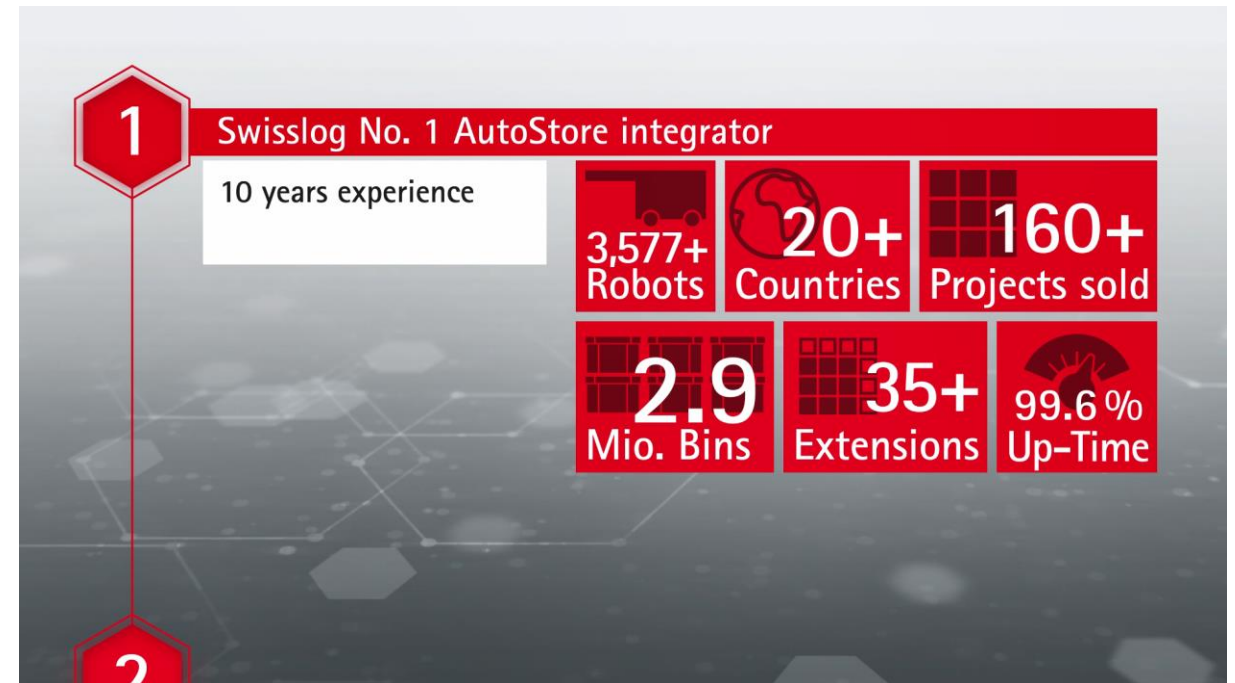*The key to harnessing the power of warehouse data lies in warehouse management and execution software.*
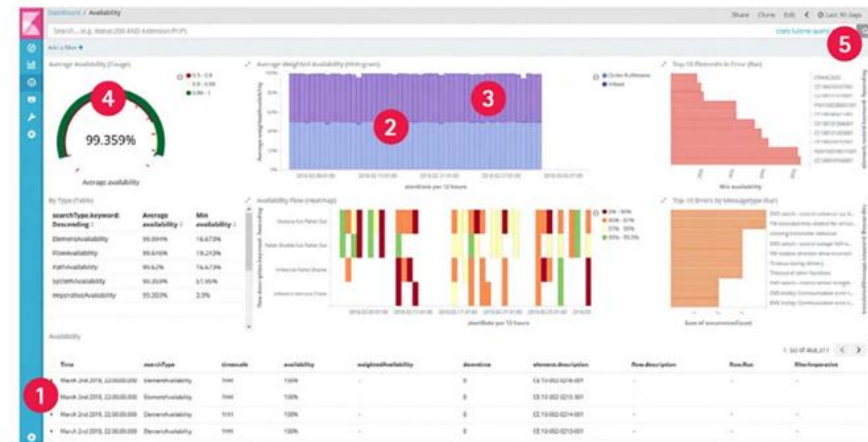
1. The SynQ Event Log shows the problem/issue at the bottom of the screen

   The timestamp links to the hourly graphical representation

2. The dip in the element availability can be seen in the 24 hour period graph below

3. Infeed is shown in purple

4. The overall availability for the period is 99.359%

5. View data by day, week or month or shift period

The Next Phase in the Evolution of the Warehouse

- Using computer interfaces to load robot firmware.

- Analyzing reports and system statistics to determine preventative maintenance priorities.

- Troubleshooting wireless communications.

[Modular and scalable, AutoStore can adapt to change by adding storage modules, robots or pick stations, providing a high degree of flexibility.]

1 Swisslog No. 1 AutoStore integrator

10 years experience

3,577+ Robots

20+ Countries

160+ Projects sold

2.9 Mio. Bins

35+ Extensions

99.6 % Up-Time

2

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The Next Phase in the Evolution of the Warehouse
CarryPick – Mobile Robotic Storage and Retrieval System

- Mobile robotics

- Battery technology and support

- Software based traffic systems

The intelligent robots require no physical changes to the warehouse so additional robots can be added at any time to meet increased throughput requirements.

Reduced downtime

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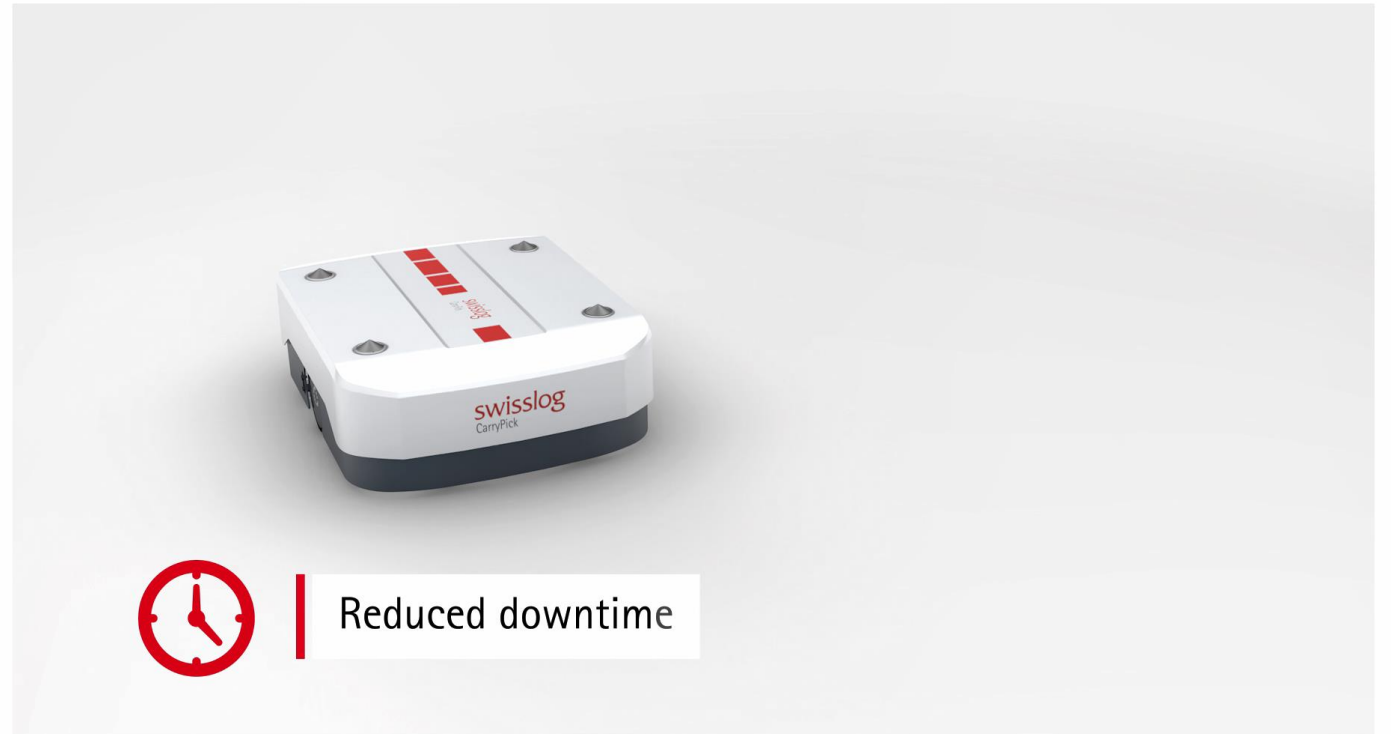
The Next Phase in the Evolution of the Warehouse
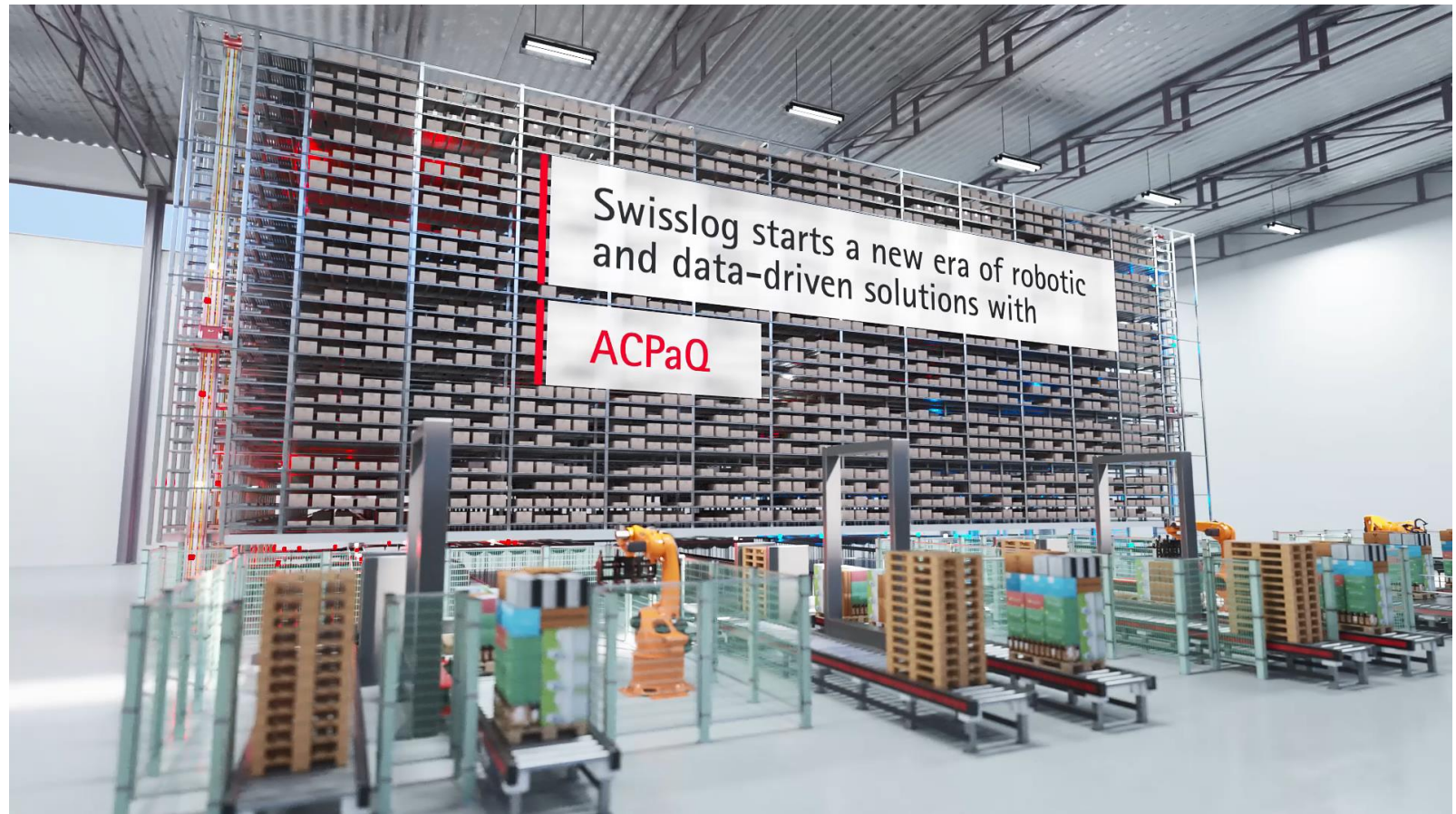## ItemPiQ – Single Item Picking

- Robotics

- Robot maintenance

[*ItemPiQ is now proving its value in standalone applications and when integrated with other automation systems such as AutoStore.*]

Hi, I'm ItemPiQ.

KUKA

The Next Phase in the Evolution of the Warehouse

ACPaQ – Automated Mixed Case Palletizing

- Software comfort

- Distribution and logistics knowledge

What does this mean for the workforce?

- Computer knowledge and comfort

- Electronic tools and meters

- Virtual work force (RealWear/HoloLens)

- Soft skills

- Maintenance best practices and predictive maintenance

- Comfort about controls systems (Allen Bradley, Siemens, Beckhoff, etc.)
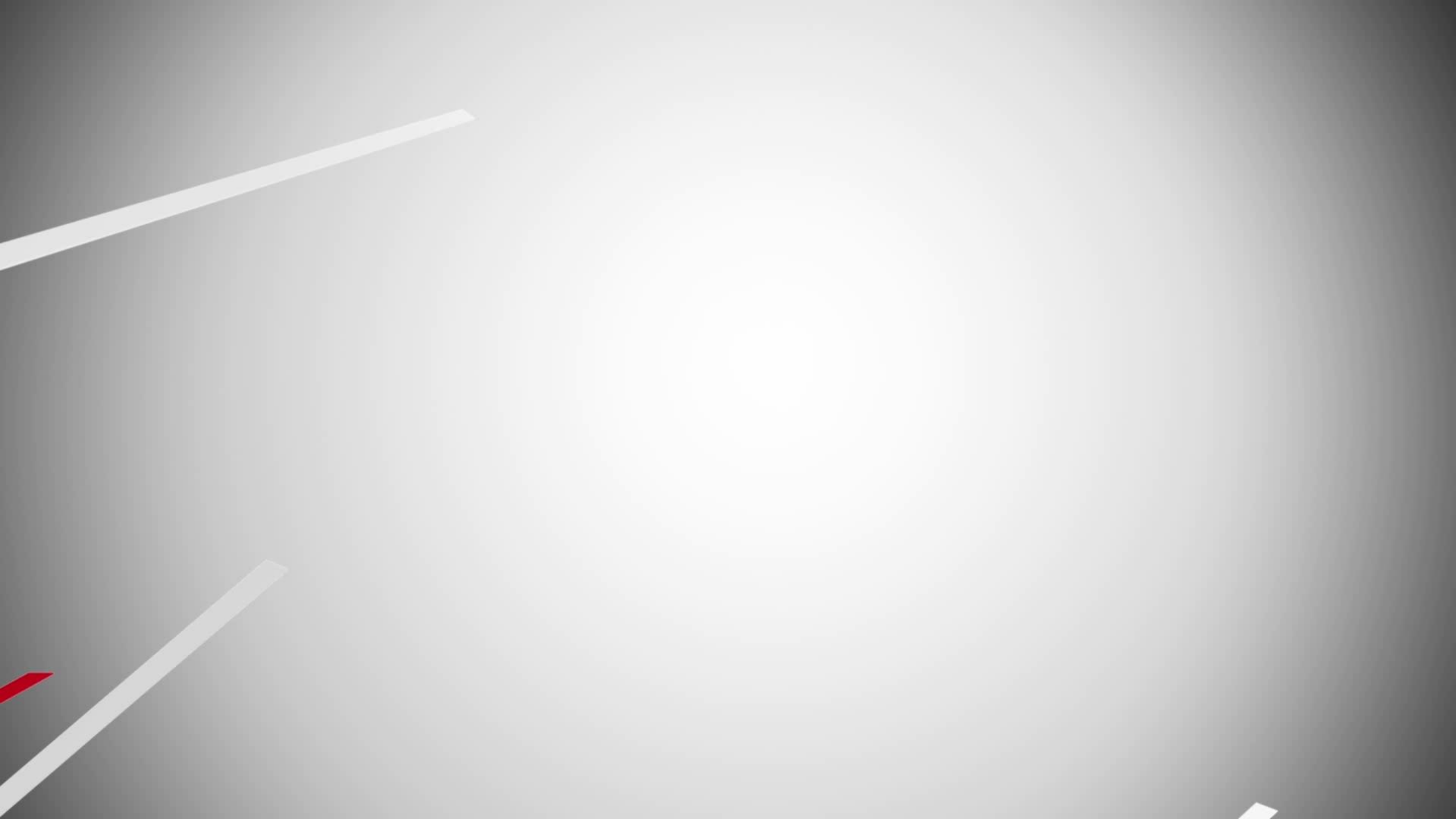
The Emergence of New Storage Concepts and Multi-Level Warehouses
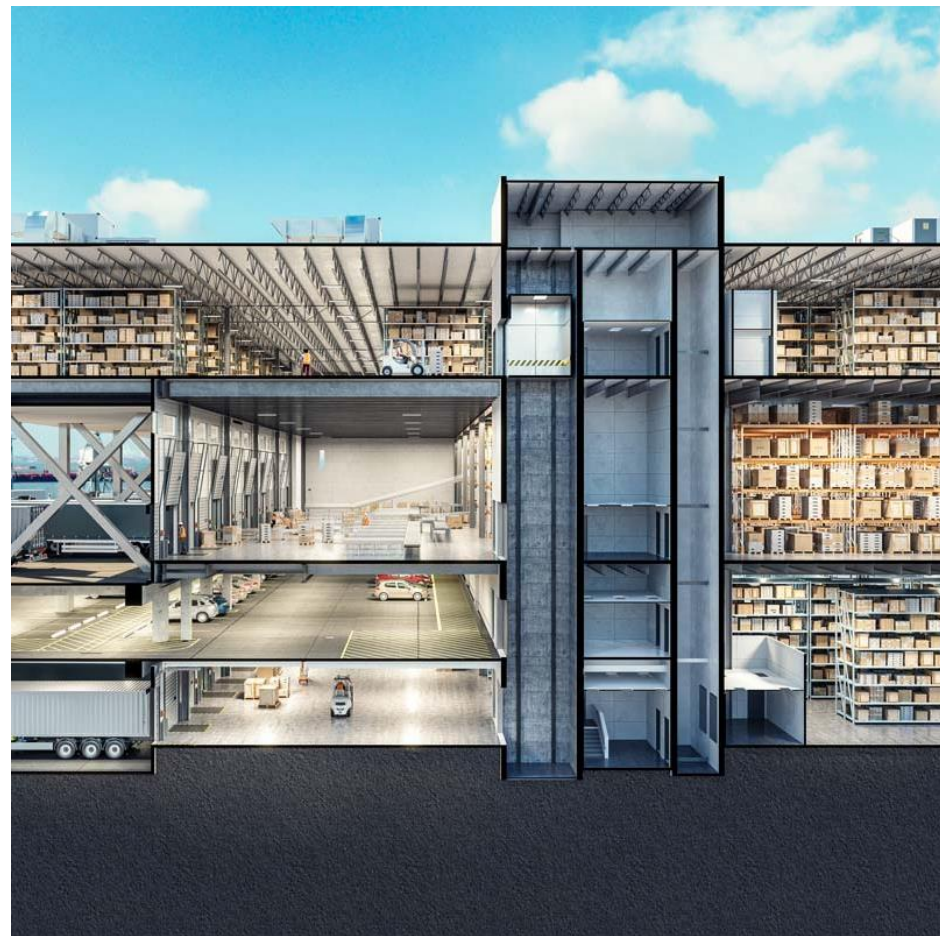
- Scarcity of real estate
- High land prices
- Multi-story facilities for urban markets
  - automation dependent
  - speed and efficiency
- Shrink inventory levels
  - frequent delivery
  - custom 3D printing
- New business models
  - shared facility
  - multiple sellers
  - consolidated shipments

The "Pop-up" Urban Distribution Center

Any area can be transformed to a distribution center within a couple hours

- Plug and play

- Fully automated

- Add or remove modules over night

- Centrally fill modules and place in the city where needed

- Modules can be used for consumers and 3PL's

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The "Pop-up" Urban Distribution Center

Any flat surface can be a warehouse – in a matter of hours

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- Weather-proof modules could be used to build pop-up urban distribution centers anywhere.

- Distribution centers can be reconfigured overnight by adding or removing modules.

- Storage modules can be pre-filled centrally, driven into the city and linked to the urban DC.

- Dedicated modules can handle vehicle loading, consumer pick-ups or – in future – drone launches.

Managing the Last Mile

- Convenient consumer pick up

- Micro-fulfillment centers

Because of increased urbanization and the growing expectation for same-day delivery of almost everything, it is becoming necessary to rethink not only how warehouses operate but where they are located.

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LET'S DISCUSS YOUR THOUGHTS

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