

Körber Supply Chain

Master Class Series

Today's Class:

Innovative Technology: Autonomous
Mobile Robots



Speakers



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Professor

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AMR DACH

Supply Chain Master Class: Innovative Technology: Autonomous Mobile Robotics

Why are we here? What are we trying to accomplish?

Class Schedule:

- May 25: Optimizing the human interface with Voice, Vision & Mobility
- June 1: Gamification: Powerful tools for motivating teams
- June 8: Know before you go: Planning warehouse improvements with simulation

Master Class Series – On-Demand

- *Addressing Labor Challenges*
- *Cold Storage Trends*
- *Warehouse Technology Excellence*
- *Sustainability*
- *The right storage method for your warehouse*

Housekeeping



All phone lines are muted

Recording of today's class and slides will be email to you within 48 hours

Questions:

- Ask questions during today's class in the GoToWebinar Questions window
- Questions will be addressed at the end of today's class or we will follow up with questions via email after class

If you feel tired... there's a reason



Warehouse staffing has more than doubled over the past decade.

There's no sign of it letting up soon.



And it's getting more expensive to staff facilities



Warehouse wage rates have increased:
22% over the past 10 years

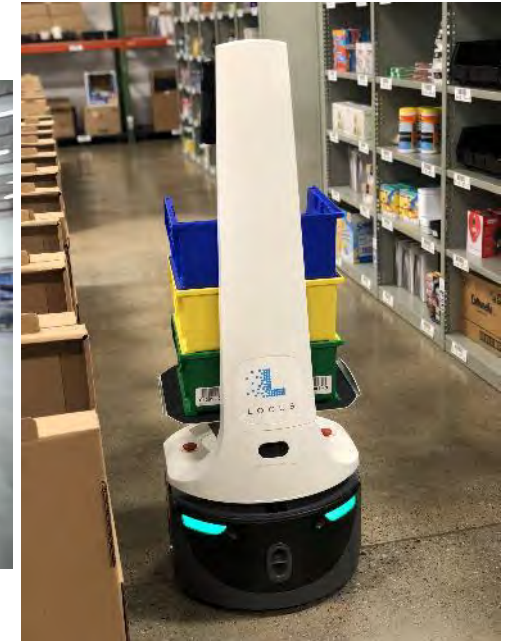
13% over the past 5 years

6% over the past 2 years

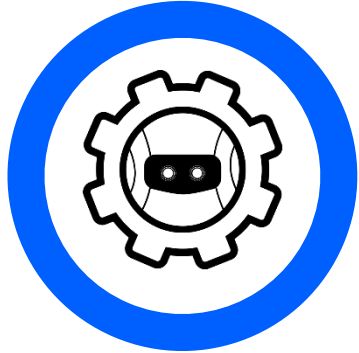
Rates have gone up considerably more in metro areas to serve large, demanding e-commerce markets and labor is tight.

What Does AMR Mean

AMR – Autonomous Mobile Robot. Modular mobile robots capable of autonomous navigation in a dynamic environment, without the need for physical or electro-mechanical guidance.



Robotics compared to Automation

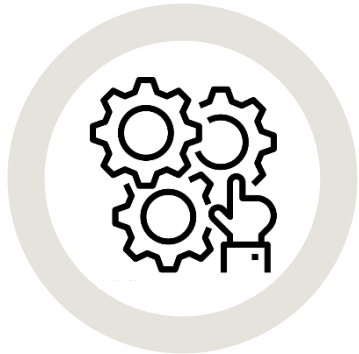


Robotics

Designed to perform a variety of tasks, capable of retooling and reprogramming to perform different tasks

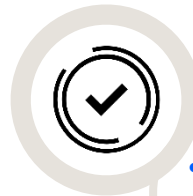


- Multi-task Capable
- Task flexibility
- Mobile (some)
- Lower investment
- Pick & Pack
- Pallet Movement
- Assembly



Automation

Designed to carry out a specific task, optimized for the task and process being performed



- Process Optimization
- Repetitive Task
- Fixed
- High CapEx
- High bay
- Conveying
- Sortation



A View on Automation & AMR's

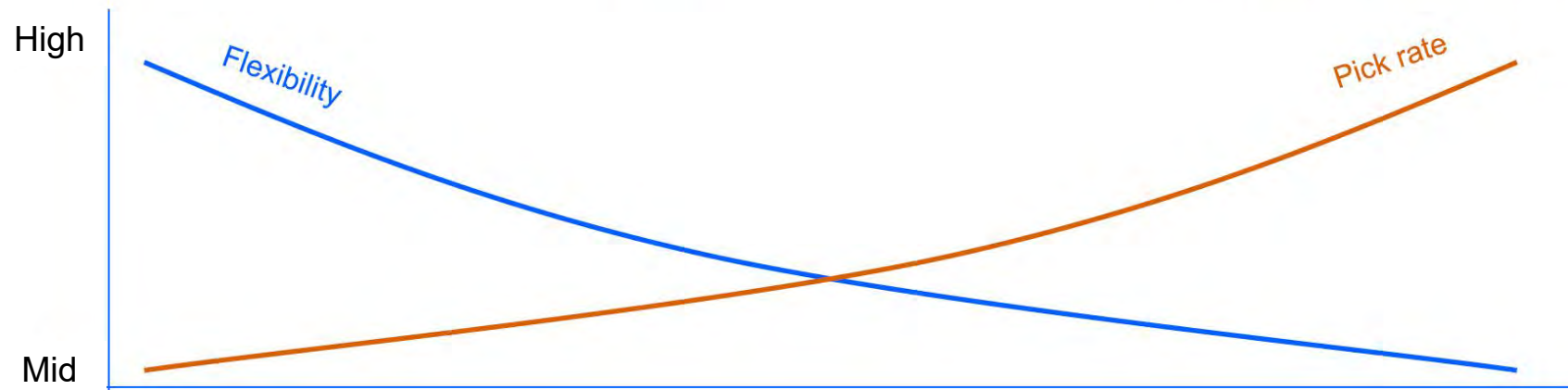
Person to Goods



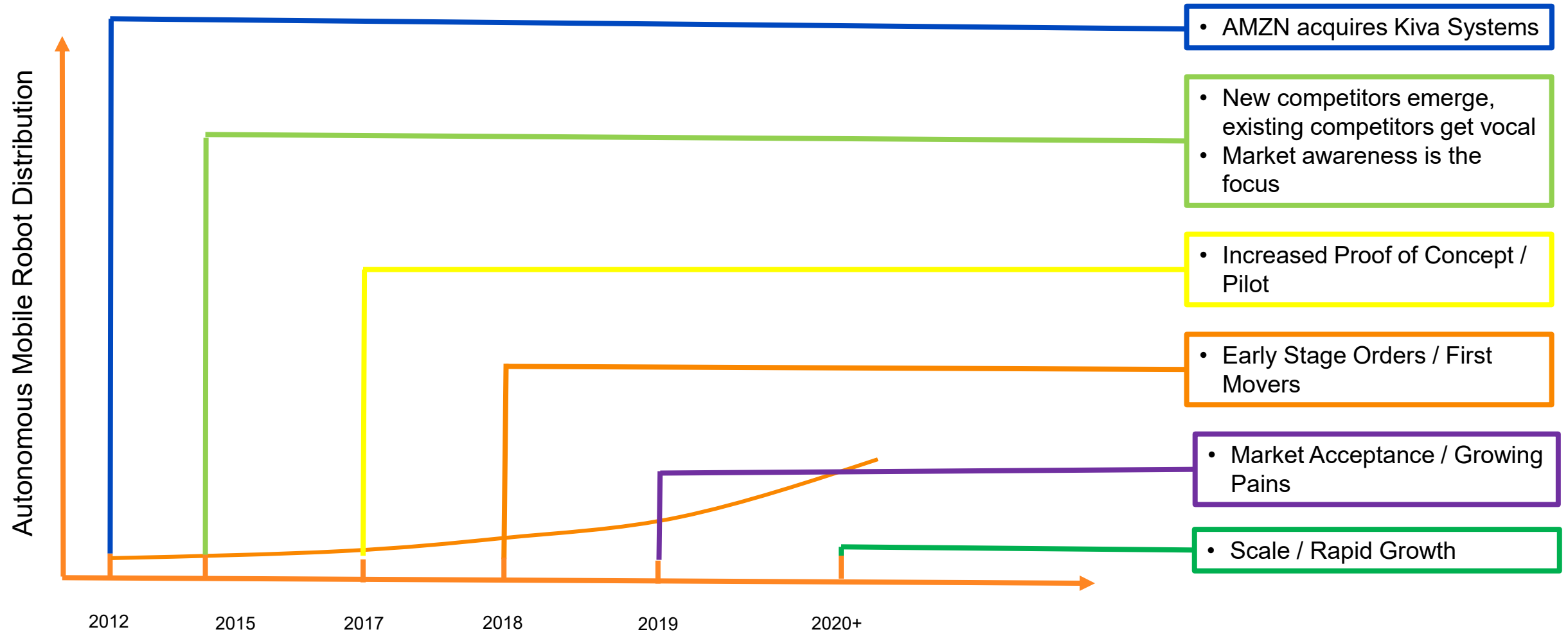
Goods to Person



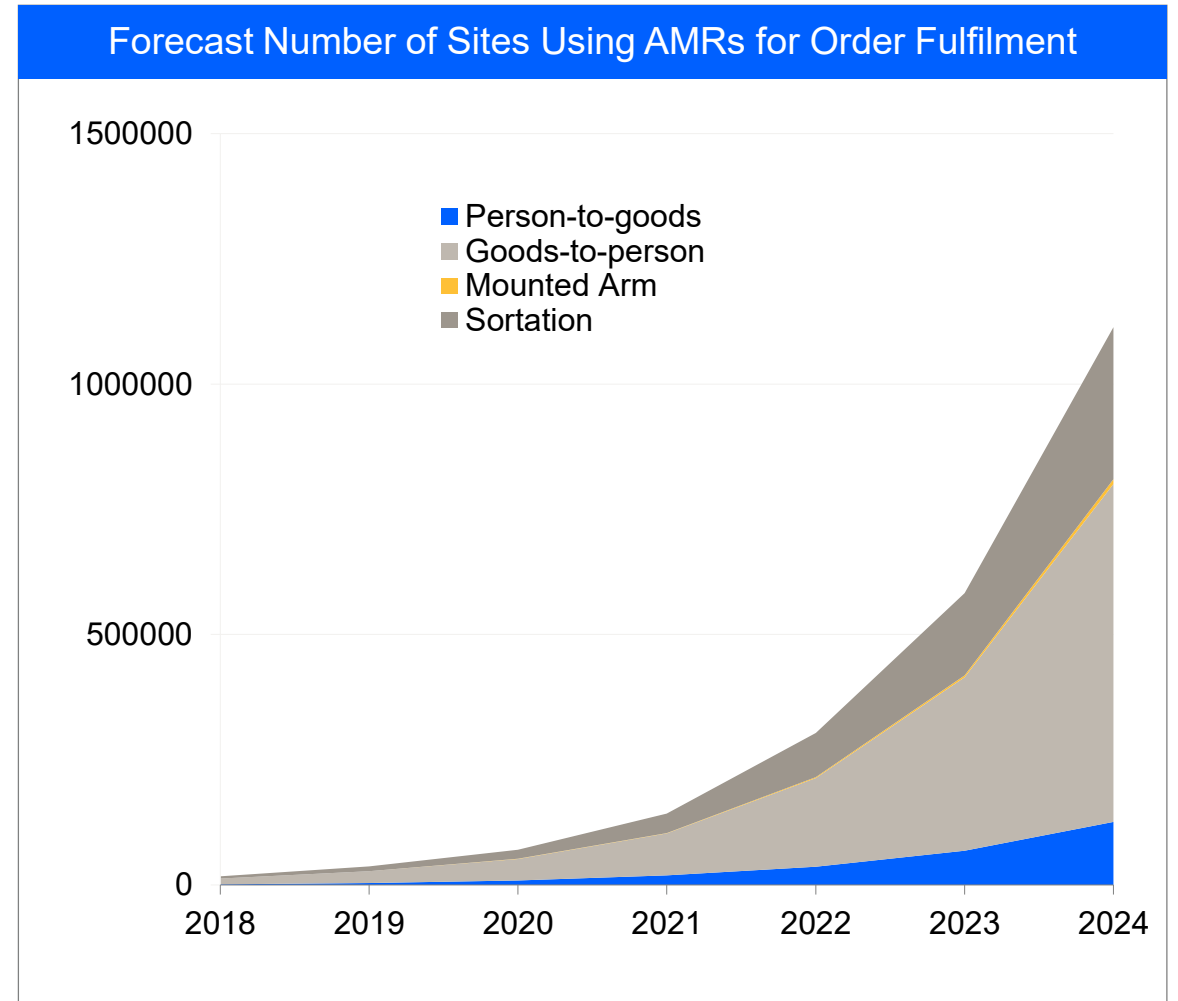
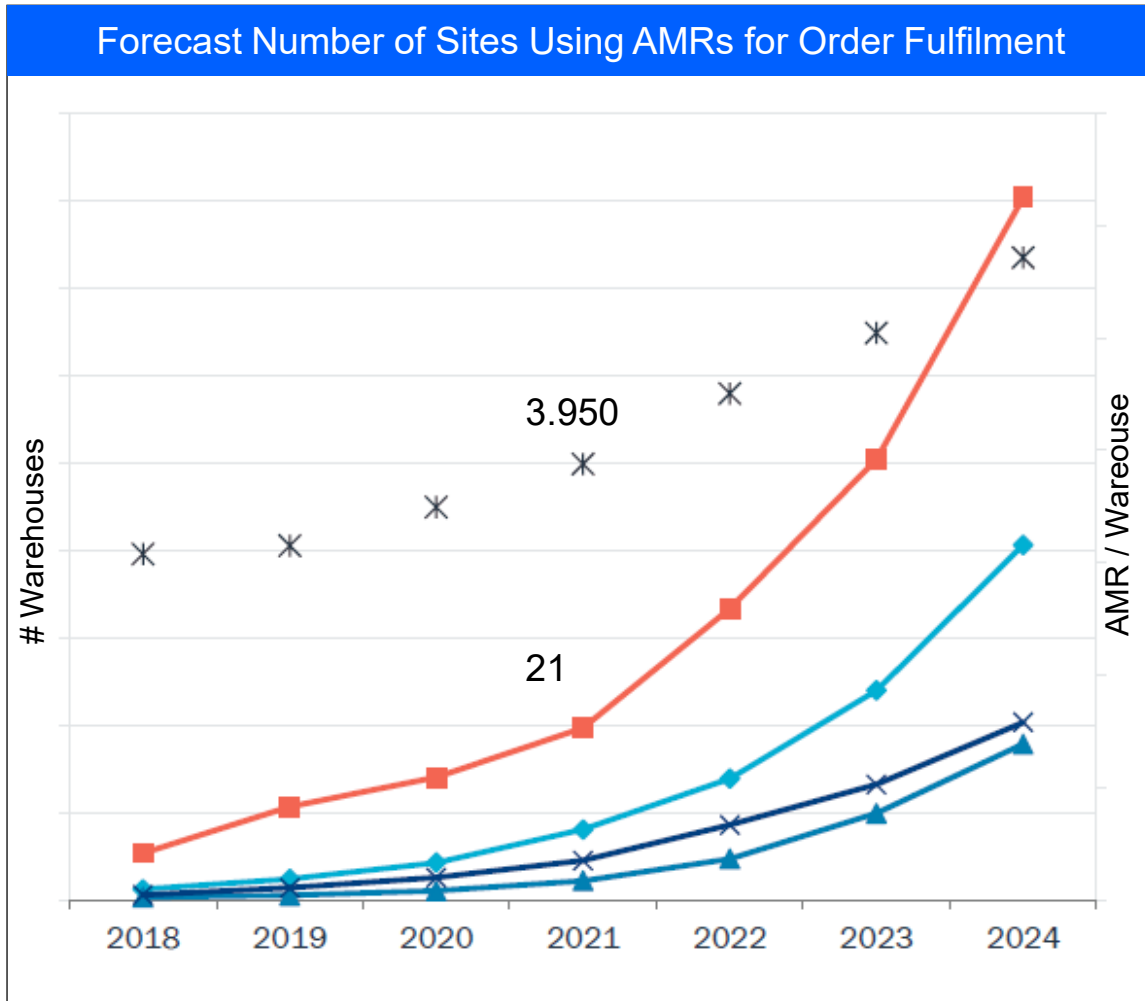
Shuttle



Collaborative AMR Market Growth Timeline



AMR Market Penetration and Forecast



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Master Class Series

- Goods to Person
- Person to Goods
- Picking Arm
- # Warehouses
- Sortation

Source: Interact Analysis

Key Benefits at a Glance



Affordable and flexible

Low-cost entry with little or no infrastructure impact. Robots are flexible and versatile and can perform multiple functions.



Easily scalable

The system can grow with you or scale up or down as needed, short- or long-term.

There are options to cover seasonal peak by temporarily lease of additional robots



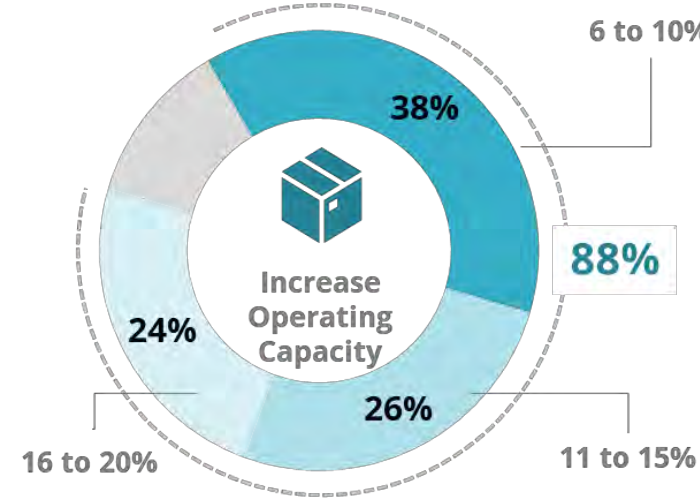
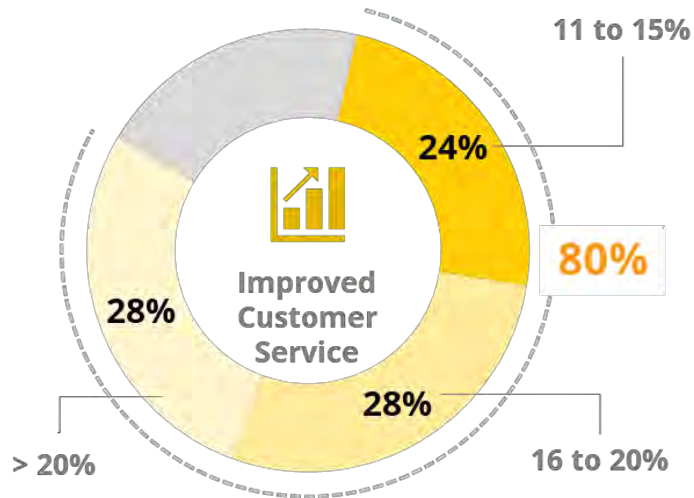
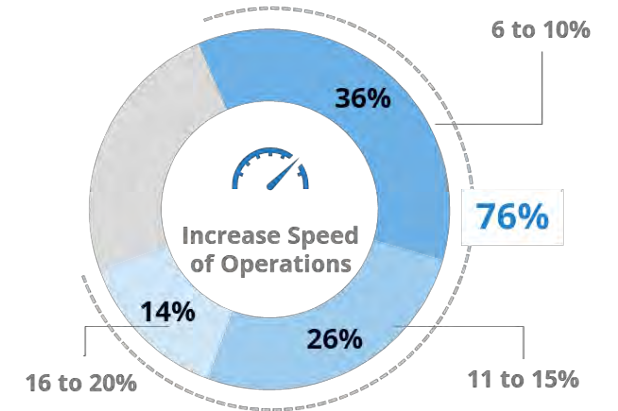
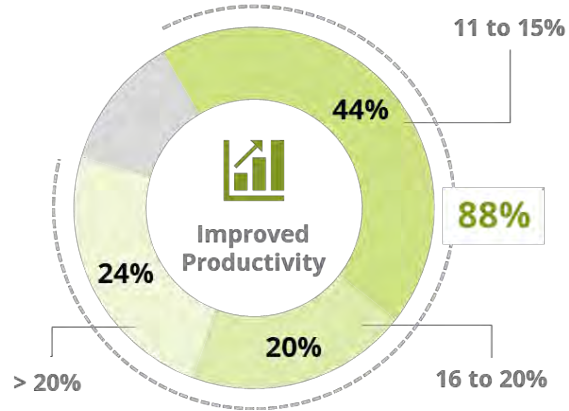
Smooth integration

The AMRs integrate easily into existing systems. Interfaces are built to delivering a constant stream of operational data the back into the warehouse and logistics systems.

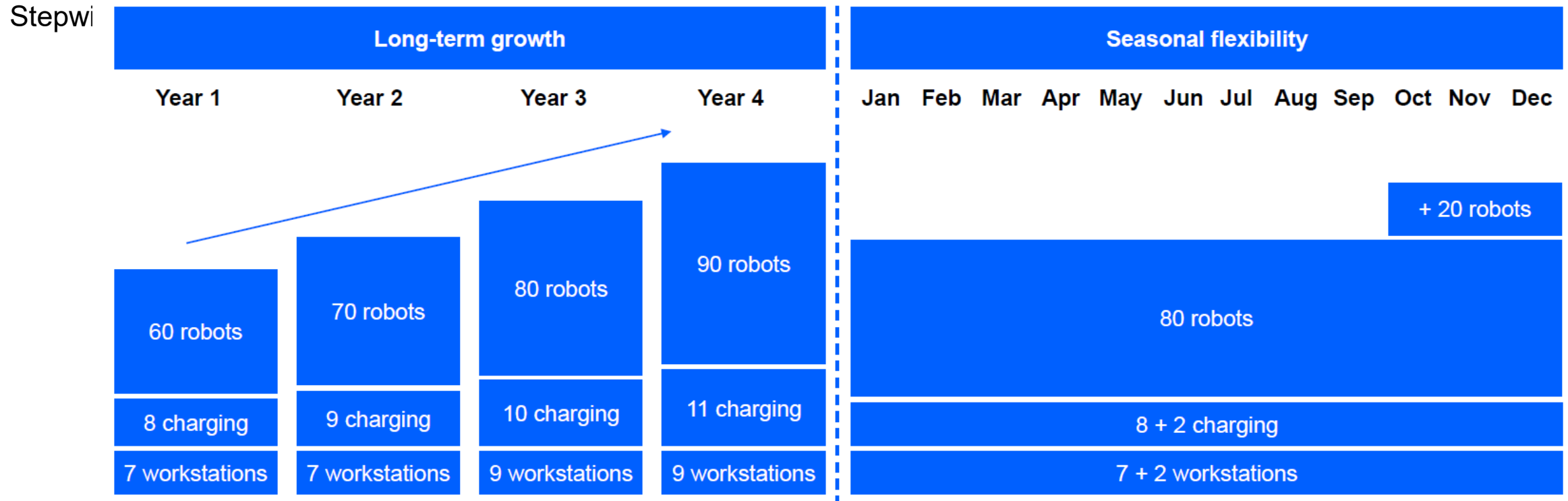
Robotics Driving Real Impact on Operational KPI's



Q. To What Degree have robots improved your business operations where deployed?



High Scalability of Solution



The system can scale up or down as needed, short- or long-term.
 There are options to cover seasonal peak by temporarily lease of additional robots

The Future of AMR's in the Warehouse



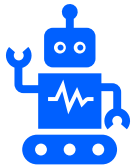
- Rapid growth – fueled by Covid-19 related e-commerce evolution



- Increased emphasis on software related elements



- People remain the most flexible resource in the warehouse



- RaaS model enables ability to keep up with the latest in the tech

Questions & Discussion

Next Supply Chain Master Class



Optimizing the human user interface with Voice, Vision & Mobility

Beyond computer screens, mobile devices, voice and vision offer additional user interfaces for accomplishing a variety of tasks around the warehouse. They can also significantly increase worker productivity.

Join us on Tuesday, on May 25, as we discuss which of these options are best suited for different tasks and workflows.

Contributor:

Matt Gregory

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Körber Supply Chain Software