Presenters

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Challenges of Today’s Supply Chain

Increased customer expectations have created an increasing demand for supply chains to possess:

• Immediacy: everything must come faster

• Transparency: communication and visibility are required early and often

• Adaptiveness: required to easily maneuver around unexpected challenges and road blocks.

• Efficiency: keep it cheap
What is Artificial Intelligence?

The development of computer systems able to perform tasks that normally require human intelligence, such as visual perception, speech recognition, decision-making, and translation between languages.
Types of Artificial Intelligence

**Augmentation**
Assists humans with their day-to-day tasks without having complete control of the output.

Examples: Virtual Assistant, Data analysis, software solutions; where they are mainly used to reduce errors due to human bias.

**Automation**
Works completely autonomously in any field without the need for any human intervention.

Example: robotics performing key process steps in warehouses
Commonly Found Applications of AI

• Search Engines
• Shopping and Advertising
• Voice Assistants
Initial Challenges

• No Clear End Goal
• Cart Before the Horse
• Unrealistic Expectations
• Wrong Strategy
• Doing it Alone
Maximize Picking Efficiency

- 20 Pickers
- 10,000 Picks (Grabs - Location/Order/SKU Combinations)
- Every pick location is known in advance including XYZ coordinates
- Max 10 picks per work assignment
- What’s the most efficient plan of execution?
Applications of AI in the Warehouse

• Order Management
• Returns Processing
• Replenishment
Service Level Commitments

Problem

100% on-time orders is impossible. Some orders will miss cutoff times. But how do we still improve on-time fulfillment?

• Only options are to manually intervene, or miss service level
• Manual intervention creates inefficiencies in processing
• Missing service level commitments generally unacceptable
Order Management

Solution

AI which identifies orders at-risk of missing cutoff times, which are then re-prioritized

- Monitoring engine taught by reviewing orders which missed cutoff times previously
- Provides real-time action and escalation of orders most-likely to be at risk for missing cutoff times by adjusting priorities
- Learns over time as new orders miss their cutoffs
- 34% improvement of on-time order processing
Returns Processing

Problem

Returns processing at most distribution centers can be very timely and inefficient, especially during the quality assessment.

- Closely verifying the integrity of certain items, large or small can be very time consuming.
- As associates fatigue from performing the same visual activity repetitively, mistakes also increase.
Returns Processing

Solution

Leveraging Machine Vision to train AI to learn the difference between something “good” and “bad”.

• Photo-eye scanners paired with AI on a moving conveyor line. Several photos are taken simultaneously of the product, AI determines if the product is considered first, second, or third-hand quality.
• Algorithm is taught initially and learns based on corrections provided by users later in the process.
• Subjective process computerized for greater speed (100x) and efficiency.
Replenishment

Problem
Warehouse replenishment traditionally is very reactive. Orders come in, items are put into pickable locations, and then picked.

• Creates bottle necks
• Adds to required order-fulfillment lead-time
• Often creates panic as service level windows close
Replenishment

Solution

Real-time optimization engine which analyzes day-to-day demand, creates future expectations, and proposes slotting and replenishment moves proactively.

- Live optimization with bi-directional data integration connecting to source systems to update parameters
- Allows for manual overrides and user intervention for special circumstances
- Seeing initial labor efficiency improvements within replenishment job function (~5%) and reduced late order by 40%
Long-term Challenges of AI

• Implementation Cost (Time and Money)
• Maintenance
• Hardware
• Company Culture
• Ethics and Regulation
Key Takeaways

• Problem-oriented approach
• AI is another tool in the tool box
• Avoid Hype, Focus on Results
• Do it with a trusted partner
For More Information

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