FIND YOURS.

The Dawn of the Digital Day: How Automation and Real Time Location Solutions are Addressing Workforce Challenges

Presented by:
Zebra Technologies
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Objectives

• Objective #1 Understand the importance Automation plays in a rapidly changing supply chain landscape

• Objective #2 Understand how Humans and Machines will work together to support these changes

• Objective #3 Understand the Use Cases possible today where Automation is supported with Intelligent Edge devices
Why Automation

“One of the most powerful forces reshaping markets will be the production and provision of products and services ever closer to the point of demand.”

Robert C. Wolcott, Ph.D.
Executive Director
Kellogg Innovation Network
Managing Partner, Clareo
E-commerce Driving Shifts in Flow of Goods

- E-commerce is a $370B market growing at 15% per year in both B2C and B2B
- All distribution flows are fundamentally changing due to e-commerce; shifts are occurring between truckload, LTL and location of distribution assets relative to customers
Parcel Volume is Up

A 20% CAGR of e-commerce from 2018-2013 will more than double goods deliveries in 5 years. Without changes, this may double delivery trips.

- Young Americans are flocking to cities, ordering more goods online
- Expectation- free and fast shipping and free returns
- Urban congestion is due to aging infrastructure and demographics

Parcels Volume

<table>
<thead>
<tr>
<th>Year</th>
<th>UPS</th>
<th>FedEx</th>
<th>USPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>2B</td>
<td>4B</td>
<td>6B</td>
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<tr>
<td>2013</td>
<td>3B</td>
<td>5B</td>
<td>7B</td>
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<tr>
<td>2014</td>
<td>4B</td>
<td>6B</td>
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<td>6B</td>
<td>8B</td>
<td>10B</td>
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<tr>
<td>2017</td>
<td>7B</td>
<td>9B</td>
<td>12B</td>
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E-Commerce Jobs – Division of Labor

Core Warehouse Functions

<table>
<thead>
<tr>
<th>Percent of Labor Costs</th>
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<tbody>
<tr>
<td>~10%</td>
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<tr>
<td>~15%</td>
</tr>
<tr>
<td>~55%</td>
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<tr>
<td>~20%</td>
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</tbody>
</table>

- **Receive**
  - Schedule arrivals
  - Dock management
  - Receipt of materials
  - Unloading and staging
  - Inspection for damage, short, incomplete etc.

- **Put Away**
  - Material handling
  - Verify storage location
  - Move material in storage location
  - Record level and location
  - Set slotting location

- **Store**
  - Physically hold the material
  - Consumes space more than time
  - Multiple forms of storage (pallet, case, each)

- **Pick**
  - Moving items from storage for orders
  - Verify inventory on hand
  - Create shipping documentation
  - Consist of travel, search and extract

- **Check, Pack, Ship**
  - Check orders for completeness
  - Confirm documents
  - Place in package(s)
  - Collect common orders
  - Schedule pick ups
  - Load vehicle

- **Value-Add Services**
  - Customization of products
  - Labeling & tagging, Special packaging, Minor assembly, Kitting, Re-pricing etc.
  - Postponement of components

- **Returns**
  - Handling product reverse flows for multiple reasons (damage, expired, returned, etc.
  - Can run 5% (retail) and up to 30% (e-commerce) of volume
  - Steps can include inspection, repair, reuse, refurbish, recycle, and/or dispose

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E-Commerce Jobs Are Going Unfulfilled, Causing Problems for Manufacturers
What Does Automation Mean Today

• Automation will support physical activity and knowledge activity
  • Robots
  • Software
• Activity breaks down to Tasks. Tasks break down to Skills.
  • Physical skills
  • Knowledge skills
• Skills will map to individuals or robots – depending upon the value created
• Artificial Intelligence and Analytics will support both automation functions
Automation - Humans and Machines

- People
- Machines
- Activity

Activity to do → Machine → Activity Complete → QA

Rules → Exception Management → Exception
Inventory Management will leverage automation and AI to identify stock outs, assign worker tasks, order products.
Automation – Inventory Checking

Yesterday

Tomorrow

Drones are being utilized to check inventory in warehouses
Automation – Product Manufacturing

Yesterday

Tomorrow

We’re letting them out of the cage!
Product Packing – Phase 1

Yesterday

Tomorrow

Warehouses leverage automation to improve worker productivity and accuracy, and lower costs
Robots are using machine vision, sensors and machine learning to mimic human behavior capabilities (including touch)
“Like a huge Vending Machine” - Warehouses leverage automation to improve worker productivity and accuracy, and lower costs
You can’t do anything about the weather. Or can you?

Weather impacts revenue and cost metrics for retailers and shippers

Analytics can:

• Identify the most strategic locations for a DC and for shipping specific products
• Determine the type of supplies, the quantity, and the time that material will be needed
• Optimize schedules, routes and loads
AI – Predictive Logistics

Advanced analytics can enable shifts from:
1. Reactive to Proactive planning
2. Manual Activity to Autonomous
3. Standard Service to Personalized

• Predictive Demand and Capacity Planning
• Predictive Network Management
• Intelligent Route Optimization

Source: IBM Institute for Business Value 2018 Global Weather Study Survey (n=1,000).
Key Takeaways

• Automation through Robotics, AI, and Machine Learning are impacting industry NOW and over the coming years

• Embracing next generation supply chain technologies helps bridge the labor gap

• There is a growing portfolio of technologies that can economically deliver location-based insights to support automation
For more information

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