Leveraging Practical Robotics in Manufacturing and Distribution

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Agenda

• Introductions
• Today's Questions
  • Digital Transformation?
  • What does the market think?
  • What do we think we know?
  • What is a Robot?
  • What problem are we trying to solve?
  • What are we accustom to?
  • What are the latest?
  • What is Collaborative / Cobot?
  • What’s holding us back?
Digital Transformation

Vital to every Industry and Market:

- Applied to every aspect of the Organization
- The utilization of advanced analytics for economic value, agility and speed
Digital Transformation

**Vital to every Industry and Market:**

- Applied to every aspect of the Manufacturing, Distribution and/or Retail Organization

- The utilization of advanced analytics for economic value, agility and speed
What does the Market Think?

- When asked about current robotics use and whether they will evaluate robotics during the next 24 months, 16% said that they currently use robotics, while 15% are evaluating robotics, for a total of 31% now either using or considering robotics. That’s up from last year, when 9% said they use robotics and 13% were considering robotics.

- For applications, using or considering robotics for pick and place or parts transfer climbed by 8% to reach 41%, while using or considering robotics for palletizing declined by 8%. Use or consideration of robotics for pick to cart, order fulfillment (picker to part), truck loading, and transportation also were on the upswing.

- “Greater functionality with robotics, more flexibility of applications, and lower costs are driving this spike in current usage and evaluation of potential use,”.

- “As labor availability becomes tighter and labor costs increase, demand for robotics will increase.”

- Spending indications for automated guided vehicles (AGVs) also were up. For 2018, 7% use AGVs, up 1% from last year, while 14% said that they’re evaluating the use of AGVs during the net 24 months, which is up 2% from last year.

2018 Warehouse/Distribution Center Equipment Survey: Automation & Robotics
Lead Robust Outlook (MMH)
What does the Market Say?

Figure 1. 2015-2017 survey results: Trend of innovations being disruptive or a source of competitive advantage

- Robotics and Automation: 61% Disrupt or Competitive Advantage, 27% Support Ongoing Improvements, 12% Little to No impact
- Predictive Analytics: 57% Disrupt or Competitive Advantage, 32% Support Ongoing Improvements, 11% Little to No impact
- Internet-of-Things (IoT): 55% Disrupt or Competitive Advantage, 33% Support Ongoing Improvements, 12% Little to No impact
- Driverless Vehicles and Drones: 54% Disrupt or Competitive Advantage, 22% Support Ongoing Improvements, 24% Little to No impact
- Sensors and Automatic Identification: 53% Disrupt or Competitive Advantage, 37% Support Ongoing Improvements, 10% Little to No impact
- Inventory and Network Optimization Tools: 50% Disrupt or Competitive Advantage, 42% Support Ongoing Improvements, 8% Little to No impact
- Wearable and Mobile Technology: 44% Disrupt or Competitive Advantage, 35% Support Ongoing Improvements, 21% Little to No impact
- 3D Printing (Additive Manufacturing): 40% Disrupt or Competitive Advantage, 28% Support Ongoing Improvements, 32% Little to No impact
- Cloud Computing and Storage: 37% Disrupt or Competitive Advantage, 47% Support Ongoing Improvements, 16% Little to No impact
- Blockchain and distributed ledger technologies: 31% Disrupt or Competitive Advantage, 41% Support Ongoing Improvements, 28% Little to No impact

2017 MHI Annual Industry Report
Next-Generation Supply Chains:
What does the Market Think?

80% believe the digital supply chain will be the predominate model within 5 years.

16% say it is today.

Disruptive Technologies:
- Robotics & Automation: 61%
- Predictive Analytics: 57%
- Internet of Things (IoT): 55%
- Driverless Vehicles & Drones: 54%
- Sensors & Automatic Identification: 53%
- Inventory & Network Optimization Tools: 50%

Adoption Rate:
- In-use Today
- 5-Year Compounded Annual Growth Rate
What are we solving for and why?

Labor Shortage

Cost of Space

Cost of Labor
What do we think we know or our bias?

✓ They are limited in their application
✓ They aren't proven
✓ They are too expensive
✓ They aren't widely used
What is a robot?

A robot is a machine designed to execute one or more tasks automatically with speed and precision.
What are we accustomed too?
Automation Storage and Retrieval
Automated Guided Vehicles (AGVs)
Industrial Robots for Palletizing & Assembly
What are the latest Robot Uses?

- Goods to Person
  - Robots Travel
- Person to Goods
  - Worker & Robots Travel
- Goods to Robot
  - Fixed Robots
- Robots to Goods
  - Mobile Robots
Goods to Person

Products are brought to packer/picker on shelf

Products are brought to packer/picker in tote
Person to Goods

**Follow Me**
Picker is paced by the bot. Once the pick confirmation is completed the bot automatically moves to the next location that a pick is required.

**Follow You**
Bot follows picker along predestined pick path. If picker stops bot stops. Picker uses hand held device to guide pick path.

**Find Me**
Bots are independent of pickers. Pickers travel main aisles in search of Bots positioned at pick location.
What are Collaborative Robots / Cobot?

• A **cobot** or co-robot (from **collaborative robot**) is a **robot** intended to physically interact with humans in a shared **workspace**. This is in contrast with other robots, designed to operate autonomously or with limited guidance, which is what most **industrial robots** were up until the decade of the 2010s.

• The Push: Collaborative robotics: Man and Machine working in common space

• Advanced force sensing and vision sensing provides a safe reliable work environment.
Goods to Robots
Robots to Goods

- AGV with Integrated collaborative industrial robot
What's holding us back?

✓ Flexibility
✓ Cost / PayBack
✓ Safety
✓ Long Term Maintenance
Questions????
Overview of enVista

• Automation & Engineering firm based in Indianapolis, IN and Robotics Lab in Chicago, IL
  • ~ 50 % Distribution Systems
    • Conveyor & Racking
  • ~ 50 % Robotic Solutions
    • Pick, Pack, and Palletize
      • Food and Medical
• Design Build Firm
• Engineering
  • Mechanical,
  • Electrical,
  • Software (WCS and PLC)
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