### Cutting the Mobile Robotic Clutter

Presented by:

NextShift Robotics





### Presenter



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### **Business Drivers**

#### E-Commerce Sales v. Department Store Sales



#### Warehouse and Storage Industry Workers (thousands)



Source: <u>https://logisticsviewpoints.com/2019/03/20/warehouse-labor-gap-unsustainable/</u>



### **Facility Demands and Challenges**



Customer Expectations



Scarce Costly Labor



Economic Pressures



Peak Season Pressure





Isolated Automation



### **Objectives – Convergences of Market Forces**





## Why Now?

- Attractive ROI
- Increase labor productivity
- Increase warehouse productivity
- Robots work 24 x 7 x 365
- Increases quality
- Rapid installation
- Flexible, scalable, and easily configurable
- Operates in existing infrastructure
- Operates without structural building reinforcement





### What Automation Won't Do...

- Fix BROKEN processes
- Remove too much dependence on one customer or business segment
- Lean your manufacturing processes

#### Good Business processes are enhanced by automation



### Robotic processes vary...

#### Logistics:

- Order fulfillment across all channels: B2C, B2B, returns
- Replenishment

**POWERED BY POSSIBILITIES.** 

• Inventory Management

#### Manufacturing:

- Material transfer in Kitting
- Material movement between Step processes



### Order Fulfillment – Multiple Options

- Goods-to-Picker
  - Multi-dimensional ASRS
  - Single Level ASRS or Shelf-less
- Automated Pickers
- Sortation
- Pickers-to-Goods
  - Robot Worker Systems
  - Worker-Free Robotic System





### Trade-offs

- Cost
- Through-put and Fast Delivery
- Scarce Labor
- Business Process Dynamics
  - Fixed
  - Mobile
- Rapid Deployment
- Vertical Density





### Goods-to-Picker Multi-dimensional ASRS

- Green Space
- Requires staging and installation of a fixed structure
- High Density
- Examples:
  - Robotic Symbotic, AutoStore, Alert Innovation, etc.
  - Shuttles Opex, Dematic, Knapp, etc.



### Goods-to-Picker Single Level ASRS

Factors:

- Green Space
- Horizontal space
- ASRS Requires shelving units to carry 1200 lbs (550 kg)
- Or Shelf-less
- Examples:
  - ASRS AMR / AGV Grey-Orange, SwissLog, Fetch, Vecna, Prime, etc
  - Shelfless InVia, Arc Robotics





### **Automated Pickers**

- Green or Brown Space
- Uses special restocking and / or uniform inventory
- Examples:
  - AMR IamRobotics, Magazino, Fetch, etc.





### Sortation

- Green Space or Area within Brown Space
- Portability increase equal to that of single level ASRS
- Examples:
  - Tompkins with NextShift, Berkshire Grey, Sure Sort, etc.









### Picker-to-Goods

- Brown Space
- Rapid Deployment
- Zoned Bin Picking
- Full Software suite
- Examples:
  - Worker-Robot Systems 6RS, Fetch, Locus, etc.
  - Worker-Free Robotics System -NextShift





### Replenishment

- Brown Space
- Rapid Deployment
- Interleaving of Picking & Replenishment Workflows
- Examples:.
  - Placing to back of Flow-rack NextShift, Conveyco, Vecna, etc.
  - Placing in Picking aisles Locus, 6RS, NextShift, etc.



### **Inventory Management**

- Factors:
  - Inventory and Hardware System
  - Many use RFID tags
- Examples:
  - Drones PINC, FlytWare, etc.
  - AMRs Bossa Nova, Robi, Fetch, etc.



## Key Logistic Robotics Considerations

#### System Trade-offs:

Low Cost	High Vertical Density
Rapid Deployment	Fixed Infrastructure
Bin Picking	Uniform inventory or shelf restocking
Zoned Bin Picking	Goods-to-Person
Optimized Robot and Worker Productivity	Robot Tethered to Person
Optimized Order Delivery	Completed Orders traveling Full Warehouse
Full Software Suite	Build Your Own
Connected	Isolated

#### Financial Trade-offs:

Robots-As-A-Service	Capital Expense



### **Robotics in Lean Manufacturing Principles**

- Lean Manufacturing is Demand Driven
- Utilizes Flexible Methods to Match Supply to Demand
- Eliminate waste (idle time, travel time, and touches)
- Visible Kanban
- Focus on Six-Sigma Quality
- Pain Point idleness



# Manufacturing – Material Transfer within Kitting

- Factors:
  - Increase kitting cell
    productivity
  - Cell scheduling and load balancing
  - Simple user interface
- Examples:
  - AMRs: NextShift, MiR, Kuka, ClearPath, etc.



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### Manufacturing – Material Movement Between Process Steps

#### Factors:

- Matches supply to demand
- Keep labor focused on process
- Reduces idle time

Examples:

 AMRs: NextShift, MiR, Omron-Adept, Vecna, etc.





## Key Manufacturing Robotics Considerations

#### System Trade-offs:

Just-in-Time Delivery	Cell Idleness
Rapid Deployment	Fixed Infrastructure
Optimized Robotic Material Movement	Workers Moving Material
Quality Increase	Worker handling
Full Software Suite	Build Your Own
Connected	Isolated

#### Financial Trade-offs:

Robots-As-A-Service	Capital Expense





### **Key Business Considerations**





### **Robotic Benefits**

- Financial Benefits
  - 1-year ROI on first install, and less than 1-year on subsequent installs
  - Increases productivity and capacity
  - Reduces delivery time
- Soft Benefits

- Builds employee retention and eases worker's stress
- Portable and configurable, right place at the right time
- Flexibility supports dynamic business environment





- Market and Technology Drivers now is the time for robotic automation
- Wide range of robotic options
- Adaptability in Hardware and Software, is the key to your competitive edge, now and in the future
- Bridge to dynamic business environments
  - Rapid Deployment and Reconfiguration
- Simple user interface and flexible software
- Your business processes drive your automation decisions





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