Leveraging ROS-Industrial to Deliver Customer Value

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3/7/18
Bastian Solutions

- Established in 1952
- 629 Employees
  - 305 Engineers
- 300+ Suppliers
- 5000+ Customers
Background

• The Challenges
Background
Enabling Trends

• Labor Costs: Minimum Wage
Enabling Trends

- Labor Costs: Unemployment Rates

![Unemployment Rate Chart](chart.png)

Source: Bureau of Labor Statistics
Enabling Trends

• Labor Costs: Seasonal Demands Difficulties
Enabling Trends

• Labor Costs: Employee Turnover
Enabling Trends

• eCommerce

  o Order complexity
  o High SKU numbers
  o Larger warehouses
  o Returns

  o Next day, same day, next hour
  o +flyers etc
  o Connection to last mile transportation (expensive)
Enabling Technologies

• Energy Sources

Enabling Technologies

• Sensors & Navigation Systems
Enabling Technologies

• End-of-Arm Tooling
Enabling Technologies

• ROS
Advantages of Mobile Robots

- Higher throughput rates
- Minimize employee turnover
- Greater reliability (no downtime)
- More efficient
- Labor optimization
- Scalable and modular solution for shifting market demands
- Greater cube density
- Short payback period (1-2 years)
- Energy Saving
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Batch Picking Mobile Robot

Patent #62215948
Batch Picking Mobile Robot

1. 6-axis Robot
   Payload: 12+ kg
   Custom End of Arm Tool

2. ROS Industrial
   Open Source

3. Opportunity Charging
   Wireless Charging
   Ultracapacitors

4. Singular Controller
   Seamless & Dynamic Motion
   Controls up to 62 Axes

5. Omnidirectional Wheels
   Speed: 230 ft/min
   Payload: 1,000+ lb
   9 ft x 4 ft

6. Gantry
   Batch Picking
   Multiple Orders
   Highest Throughput Rates

7. Navigation
   Obstacle Avoidance
   Fleet Management
   Conforms to Safety Standards
Mobile Robot-Fleet Management
Euler- SwRI
Batch Picking Mobile Robot: Features

- System throughput rates example with 7 Robots:
  
  1200 Orders/hour = 115k Lines/hour

- Vehicle top speed: 230 fpm

- Positioning precision: +/- 6 mm (+/- 10 mm at full speed)

- Capacitor life: 1 Million cycles (10 years)

- One charge = 60 minutes of power

- Meets AGV Safety Standards ANSI B56.5
Truck Loader/Unloader
Truck Loader/Unloader
Truck Loader/Unloader
Vision
R&D Projects
Summary

- ROS-I has been a key enabler for our advanced robotic divisions at Bastian Solutions.
  - Move It, Descartes, Simple Message Protocol, Perception, Euler, TF, and industrial robot client. + Other tools and libraries available in ROS: Gazebo, RViz, sensor fusion, Ethernet IP, etc.
  - Training and Fast Ramp-up
  - Hiring talents
  - Modularity with various robotic systems
  - Accelerated Timeline
Conclusion

ROS–I Enabler

Invested Commitment

Organic Business Growth

Value to Customer 😊

Accelerated Go–To Market
Thank you

Questions?