Rethinking Automation

Presented by:
Marc Braun
Pcdata USA

MAKE YOUR BUSINESS
FUTUREPROOF.
Speaker & Sponsor Background

• Background
  ▪ President Pcdata USA (2009 - )
  ▪ Business Owner and Consultant – CNC Manufacturing in Europe– 3yrs
  ▪ Sales and Marketing VP for Gilbarco Veeder Root EMEA (UK)
  ▪ Sales and Marketing executive for GVR in CT – 6 years
  ▪ Active Speaker and Promoter of Automation with MHI, WERC, and other industries related to Pcdata’s business
  ▪ Love yoga, hiking, dark chocolate

• Pcdata
  ▪ Over 800+ Systems Installed Worldwide.
  ▪ Dedicated to Create Innovative, Flexible and Easy to Implement Systems.
TOPICS

• Why consider Automation?
• How can Automation help your organization meet today’s increasing demands?
• Implementing new technologies – Pitfalls and how to avoid them.
• ROI calculation tips and top missed/hidden costs that companies tend to overlook
• New financing options to consider
Why consider Automation?
Why Change?

- Internal forces
- External forces
E-commerce driving fundamental market changes

- In 2017, 10% of retail sales e-commerce
- E-commerce is outpacing retail sales growth @ 7:1
- Exacerbating pressures to deliver cheaper, faster, more choices
2017 MMH Surveys – The supply chain is in the thick of e-commerce adjustments

- Automated piece picking
- Use of robotics
- Throughput metrics
- DC size reduction
- Increase in 3PL outsourcing

(source: Peerless Research group 2017)
Technology developing at record pace

- Augmented Reality (AR)
- Vision Pick
- Drones
- Robots
- OLVs
- Self driving trucks
Technology advances at accelerating pace
Anyone who isn't confused really doesn't understand the situation.

Edward R. Murrow
State of warehousing and distribution

- Nearly 2/3rd of companies provide Omni-Channel distribution options; e-commerce is driving almost half of these sales.
  - Data capture technology has made a positive impact on companies’ omni-channel and e-commerce strategies.
- Management’s top actions to increase profitability:
  - Improve employees accuracy
  - Increase staff morale
  - Integrating technology into workflows
- Almost 25% of workers do not speak the local native language

![Warehouse Fulfillment Automation Level](source: MMH 2017)
How can Automation help?
How Can Automation Help

- Labor shortage
- Decrease operating costs
- Higher tracking and tracing
- Higher accuracy
- Better productivity
- Reliability and consistency
- With Hazard and Harsh Conditions
- Unique & Specialized Activities
Implementing Automation - avoiding pitfalls
"I think you should be more explicit here in step two."

- S. Harris
Good planning yields best results

- Know your business and market
- Know what you want to improve, set realistic goals
- Select the right technology - simulate
- Manage the change:
  - Organizationally
  - Process
  - IT
- Measure! (and tweak) after implementation
Pitfalls

• Proper business plans & customer demands *(Short & Medium Terms)*
• Poor or outdated operational data / information
• Business patterns and seasonability
• WMS, ERP, WCS and IT capabilities
• Product flow / Facility layout / Material handling & storage equipment
• Labor force and experience
• Lack of flexibility, ease of use, simple implementation
AUTOMATION = CHANGE

“The measure of intelligence is the ability to change”.

*Albert Einstein*

“The world as we have created it is a process of our thinking. It cannot be changed without changing our thinking”.

*Albert Einstein*

“Change is hard.”

Anyone who’s tried
Example

One operator / cell

Improvement:
• 160 – 330 b/hr
  (55 – 150% faster)
• 0.5 – 1.5 man/shift
• 1.5 – 4.5 man/day/cell

1.5 yrs < ROI < 4 yrs

220 – 290 o/hr
450 – 550 o/hr
Example

- Product flow
- Scale ability
- Available time
- Throughput per hour
- Flexibility
- Adaptability
Selecting and Implementing a New System Solution

- Evaluate SKU/Manufacturing volumes
- Consider current staffing levels & experience
- Survey facility for the best fit
- Consider new layout(s) to maximize impact
- Set performance goals
- Analyze existing process to calculate ROI
- Evaluate existing IT (WMS, ERP, WCS, etc) capabilities
- Consider speed and accuracy levels
- Do your homework
- Select a system that can grow with your business
### 2-Aug 6-Aug

<table>
<thead>
<tr>
<th>Concept 1</th>
<th>2-Aug</th>
<th>6-Aug</th>
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<tbody>
<tr>
<td></td>
<td>50.6</td>
<td>72.9</td>
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<tr>
<td>Concept 2</td>
<td>64.0</td>
<td>79.5</td>
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21% 9%
Select Technology Fit for Purpose

- Pick to Light
- Horizontal Carrousels
- RF Picking
- Put-to-Light
- Smart Glass or AR
- AS/RS
- Put Walls
- Mini AS/RS
- Voice Picking
- Pick Carts

MHI.
THE INDUSTRY THAT MAKES SUPPLY CHAINS WORK®
Select Technology fit for purpose

<table>
<thead>
<tr>
<th>Picks / Manhour</th>
<th>0</th>
<th>100</th>
<th>200</th>
<th>300</th>
<th>400</th>
<th>500</th>
<th>600</th>
<th>700</th>
<th>800</th>
<th>900</th>
<th>1000</th>
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<tr>
<td>C, D</td>
<td>Paper Picking</td>
<td>Pick to Voice</td>
<td>PICK CART</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C, D</td>
<td>RF Picking</td>
<td></td>
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<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

- Order Volume  - Order Priority  - Inventory
- Travel Time   - MHE Status     - Labor Availability
- Picking Activities - Packing Requirements
- Shipping Procedures
## Systems Comparison (Sample)

<table>
<thead>
<tr>
<th>Assessment Category</th>
<th>RF Scanning</th>
<th>Voice Technology</th>
<th>Pick/Put to Light</th>
<th>Mobile Pick Cart</th>
</tr>
</thead>
<tbody>
<tr>
<td>Productivity, Speed</td>
<td>★★</td>
<td>★★★★</td>
<td>★★★★</td>
<td>★★★★</td>
</tr>
<tr>
<td>Accuracy</td>
<td>★★★</td>
<td>★★★★</td>
<td>★★★★</td>
<td>★★★★</td>
</tr>
<tr>
<td>Data Capture Capability</td>
<td>★★★★★</td>
<td>★</td>
<td>★</td>
<td>★★★★</td>
</tr>
<tr>
<td>Flexible Multifunctional Capability</td>
<td>★★★★★</td>
<td>★★★</td>
<td>★★★</td>
<td>★★★★</td>
</tr>
<tr>
<td>Hands Free</td>
<td>★</td>
<td>★★★★</td>
<td>★★★★</td>
<td>★★★★</td>
</tr>
<tr>
<td>Learning Curve</td>
<td>★★★</td>
<td>★★★</td>
<td>★★★★</td>
<td>★★★★</td>
</tr>
<tr>
<td>Maintenance</td>
<td>★★</td>
<td>★</td>
<td>★★★★</td>
<td>★★★★</td>
</tr>
<tr>
<td>IT Ease of Integration</td>
<td>★★★</td>
<td>★★★</td>
<td>★★★★</td>
<td>★★★★</td>
</tr>
<tr>
<td>System Cost</td>
<td>★★★★★</td>
<td>★★★</td>
<td>★★★★</td>
<td>★★★★</td>
</tr>
</tbody>
</table>

Source: MWPVL International & PCDATA BV
Simulate the after situation
Manage the change

- Create and maintain buy-in at all levels
- Milestone plan with regular reviews
- Training and on-site support
- Onsite ‘expertise’
- Support infrastructure in place

**The Change Curve**

<table>
<thead>
<tr>
<th>Stage</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<tbody>
<tr>
<td>State</td>
<td>Status quo</td>
<td>Disruption</td>
<td>Exploration</td>
<td>Rebuilding</td>
</tr>
<tr>
<td>Reaction</td>
<td>Shock, Denial</td>
<td>Anger, Fear</td>
<td>Acceptance</td>
<td>Commitment</td>
</tr>
</tbody>
</table>

Source: Elisabeth Kubler-Ross
Measure and tweak the ‘after’ situation

• You don’t know what you don’t know
• Create ownership of success
• Blame free environment
• Data driven root cause analysis
• Stay flexible and rigid at the same time
• Change one thing at a time
Return on Investment
Return On Investment (ROI) Calculations EXAMPLE

Pick to Light Calculation Model - Productivity

<table>
<thead>
<tr>
<th>Environment Variables - Volume</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total # of orders</td>
<td>400 per day</td>
</tr>
<tr>
<td>Total # of order lines</td>
<td>2,000 per day</td>
</tr>
<tr>
<td>Total # of units</td>
<td>10,000 per day</td>
</tr>
<tr>
<td>Total # of SKUs</td>
<td>350 total</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Productivity Parameters PTL</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Orderpick speed</td>
<td>5.00 sec/line</td>
</tr>
<tr>
<td>Walking speed</td>
<td>0.80 m/sec</td>
</tr>
<tr>
<td>Order Start</td>
<td>10.00 sec/order</td>
</tr>
<tr>
<td>Order Finish</td>
<td>20.00 sec/order</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Environment Variables - Equipment</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total # of layers in rack</td>
<td>3.00 layers</td>
</tr>
<tr>
<td>Distance per location</td>
<td>0.50 mtr</td>
</tr>
<tr>
<td>Length of the system</td>
<td>58.33 mtr</td>
</tr>
<tr>
<td>Total # of zones</td>
<td>6 zones</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Environment Variables Current - Personnel</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Time Available</td>
<td>8.00 hrs</td>
</tr>
<tr>
<td>Actual current FTE</td>
<td>FTE</td>
</tr>
<tr>
<td>Current lines per man hour</td>
<td>lines</td>
</tr>
<tr>
<td>Calc current FTE</td>
<td>3.98 FTE</td>
</tr>
<tr>
<td>Workdays</td>
<td>220 per year</td>
</tr>
</tbody>
</table>

Start-up Time (hrs) | Walking Time (hrs) | Picking Time (hrs) | Order Finish Time (hrs) | Total Time (hrs) | Total Order Pick FTE |
<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.11</td>
<td>16.20</td>
<td>2.78</td>
<td>2.22</td>
<td>22.31</td>
<td>2.79</td>
</tr>
</tbody>
</table>
Return On Investment (ROI) Calculations EXAMPLE

Pick to Light Calculation Model - Savings

<table>
<thead>
<tr>
<th>Personnel Cost</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Hourly rate</td>
<td>20.00 EUR</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Quality Cost</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost per Error</td>
<td>5.00 EUR</td>
</tr>
<tr>
<td>Current error percentage</td>
<td>0.50 %</td>
</tr>
<tr>
<td>PTL error percentage</td>
<td>0.10 %</td>
</tr>
</tbody>
</table>

Required Hardware Quantities

<table>
<thead>
<tr>
<th>Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total # of pick displays</td>
<td>350</td>
</tr>
<tr>
<td>Total # of zone displays</td>
<td>6</td>
</tr>
<tr>
<td>Total # of controls</td>
<td>2</td>
</tr>
<tr>
<td>Total length of power rail</td>
<td>60</td>
</tr>
<tr>
<td>Total length of profile</td>
<td>175</td>
</tr>
<tr>
<td>Total length of bus cable</td>
<td>210</td>
</tr>
</tbody>
</table>

Pcdata recommended values
Calculated fields

<table>
<thead>
<tr>
<th>Yearly Savings</th>
<th>Personnel Cost (EUR)</th>
<th>Error Cost (EUR)</th>
<th>Total Cost (EUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current (PAPER)</td>
<td>140,264.55</td>
<td>11,000.00</td>
<td>151,264.55</td>
</tr>
<tr>
<td>New (PTL)</td>
<td>98,185.19</td>
<td>2,200.00</td>
<td>100,385.19</td>
</tr>
<tr>
<td>Savings per year</td>
<td>42,079.37</td>
<td>8,800.00</td>
<td>50,879.37</td>
</tr>
</tbody>
</table>
Top Missed / Hidden Costs with picking error

– Customer management
  • Lost Sales and/or Lost Customer
– Re-pick, Re-stock, Packaging
– Freight 3x
– Administration
– Damages
– Charge Backs
Financing Automation
Financing

*Normal Costs Associated with a System Purchase*

- Value/Price of the system
  - Licenses & fees
  - Shipping, T&E, etc.
- Maintenance and/or upgrades
  - On going Support
## Capital Expense Example

<table>
<thead>
<tr>
<th></th>
<th>Hardware</th>
<th>System Integration</th>
<th>Professional Services</th>
<th>TOTALS</th>
<th>Calculation Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>RF Scanning</td>
<td>$75,000</td>
<td>$25,000</td>
<td>$45,000</td>
<td>$145,000.00</td>
<td>100,000 Sqft, 2,500 SKU's, 25 Operators</td>
</tr>
<tr>
<td>Voice Technology</td>
<td>$165,000</td>
<td>$45,000</td>
<td>$40,000</td>
<td>$250,000.00</td>
<td>100,000 Sqft, 2,500 SKU's, 25 Operators</td>
</tr>
<tr>
<td>Pick/Put to Light</td>
<td>$200,000</td>
<td>$15,000</td>
<td>$20,000</td>
<td>$235,000.00</td>
<td>100,000 Sqft, 2,500 SKU's, 25 Operators **</td>
</tr>
<tr>
<td>Mobile Pick Carts</td>
<td>$160,000</td>
<td>$10,000</td>
<td>$25,000</td>
<td>$195,000.00</td>
<td>100,000 Sqft, 2,500 SKU's, 25 Operators, 14 orders/cart</td>
</tr>
</tbody>
</table>

**Note:**

** - Typically you use the 80/20 rule and have less than 2,500 SKU's on a Pick/Put to Light

*No Material Handling Equipment is included in the calculations*
New Financing Options Available

Traditionally

- Total Investment becomes a Capital Expenditure
  - Normally requires depreciation schedule
  - Board of Directors / Higher management review
  - Long term financial planning
  - Longer time for decision making
  - Possible initial financial hardship
New Financing Options Available

**New Considerations**

- **Leasing Options**
  - Several financing institutions offer lease options
  - Easy/Flexible monthly payments
  - Exclude maintenance, support, license, fees, T&E, etc.
  - Faster internal approvals
  - Possible Tax benefits/advantages

- **Supplier’s Offer Easy Payments**
  - Monthly easy payments for service agreements, licenses, upgrade fees and support priority
  - Flexibility to use other Depts. budgets (maintenance, operations, etc.)
  - Easier to negotiate longer term agreements
THANK YOU FOR ATTENDING

Questions & Answers
For More Information:

Speaker email: Marc.Braun@pcdatainc.com
Phone number: +1 855-844-1086
Website: www.pcdata-logistics.com
visit our booth during Modex2018
Booth #B4063
Quick Key Findings (2015 Honeywell survey DC managers UK, France, Germany and Northern US)

- Picking accuracy is of growing importance and mis-picks are an ongoing issue within the workplace and one that could be avoided through new technology and processes.
- Organizations that measure the cost of mis-picks are on average losing $389,000 a year due to mis-picks in the picking workflow.
- Nearly two thirds (60%) of organizations agree that “Large time and cost savings opportunities can be found in gaining back mere seconds in operations workflows.
- 89% of managers believe that investing in new technology would enable them to achieve time savings and improve worker productivity.
- On average, organizations could find nearly 3,000 hours’ worth of direct labor hour reductions if processes were made more efficient.
- Surprisingly nearly a quarter (23%) of distribution centers still use paper. This is highest in the US at 27%.
Steps For Automation Implementation

Success will depend on these actions

- Analysis & Simulate
- Engage All Participants
- Execute Implementation
- Calculate Value ROI
Historic and projected robotic sales growth

Estimated annual worldwide supply of industrial robots
2008-2016 and 2017*-2020*

Source: IFR World Robotics 2017
Distribution and Manufacturing Implications

- **Distribution trends:**
  - Quick delivery demand
  - Increased no. SKU’s
  - Smaller orders more often
  - Increased customer service needs
  - Higher operating costs

- **Manufacturing trends**
  - Need to lower costs
  - Demand for smaller quantities
  - More flexibility & customization
  - Quicker delivery
Good Plan = Best Results

• Know what to expect about results
  – Set realistic expectations
• Develop a value perception among top management
• Involve more people in planning and achievement of results
• Accurately identify the changes that will improve results
• Create a plan to measure and quantify those results