The Intelligent Application of Automation: Finding the Proper Balance of Man and Machine

Sponsored by:

Presented by:

Chris DeLisle
Sr. Engineer
Karl Hoegen
CEO North America

Agenda

- **Identifying the need for automation**
  - What do our customer's tell us?
    - ✓ Why?
    - ✓ When?

- **Determining the proper level of automation**
  - Factors to consider
  - System examples: low, mid, high automation
  - Different solutions for different items within the same warehouse
  - Compromises made for sizing

- **Deciding which tasks need to remain conventional**
  - How can these tasks be ergonomically designed

Identifying the need for automation

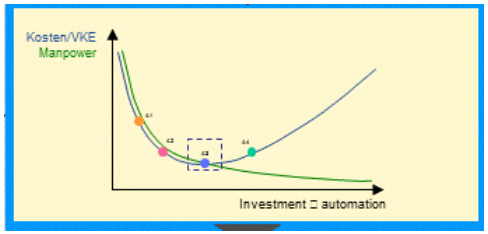
- **Business demands**
  - SKU proliferation
  - Increasing volume
  - Changing order profile (more case picking, more each picking)
  - More frequent store deliveries

- **Labor (in DC and at the stores)**
  - Labor cost
  - Labor availability
    - ✓ Geographical influence

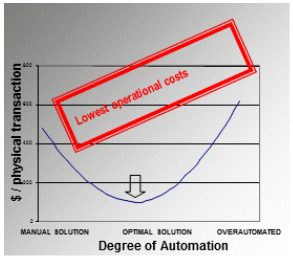
- **Warehouse environment**
  - Coolers and freezers

- **Strategic reasons**
  - Better inventory control
  - Higher accuracy
  - Reduced damage and pilferage
  - Store friendly delivery
    - ✓ Fewer stock-outs and labor savings in shelf replenishment
  - Capability to build display pallets in-house (less DSD)

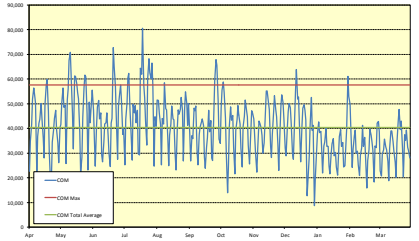
Factors That Can Dictate Automation Level



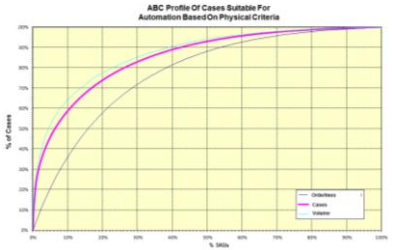
- **Investment**
  - Regardless of return, capital availability might constrain the solution.
  - "Low hanging fruit" might encourage sub-optimization.
  - Automating must produce financial benefit. Investment must be weighed against savings, with labor and footprint as the two largest components. Many of our customers report a payback period of 3 years or less.



- **Business volatility**
  - Although automation is flexible if designed intelligently, businesses with extreme seasonal peaks might be better suited to lower levels of automation or even conventional approaches.
    - ✓ The higher the degree of automation, the more important system utilization becomes.



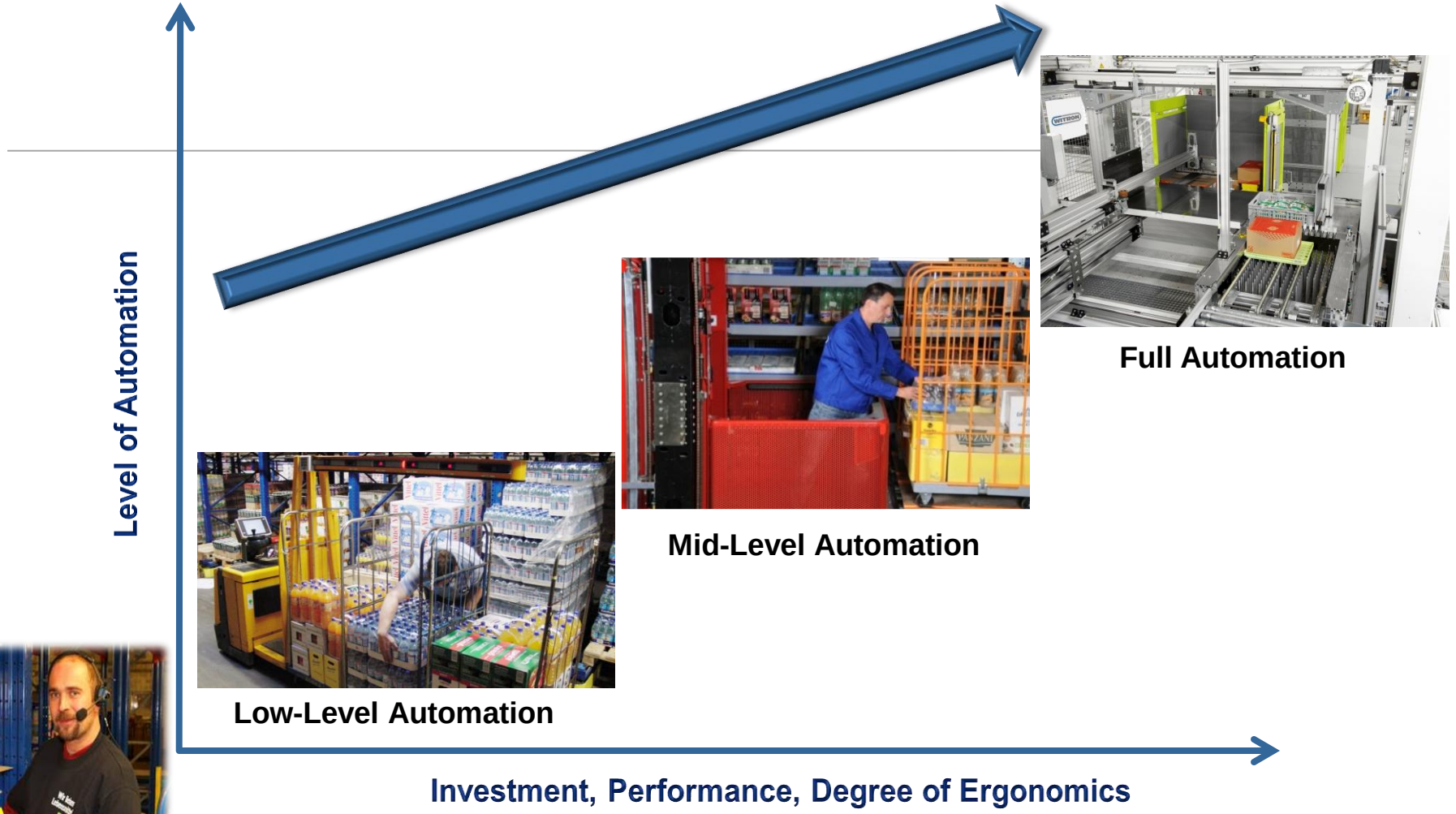
- **Order profile**
  - Volume by itself is not always a good indicator. High volume across a limited number of SKUs can often be effectively handled with lower levels of automation. Justification can be problematic for higher levels of automation if the number of SKUs is low.



- **Item characteristics**
  - Large and bulky items might not be suitable for fully automated systems.
  - Packaging quality needs to be considered when looking at higher levels of automation.
  - Heavy cases might be a driver to consider more automated approaches (i.e. beverage industry).

- **Environment and ergonomics**
  - Justification can be easier in refrigerated and frozen warehouses.
    - ✓ Labor availability and quality can be problematic in refrigerated and frozen warehouses.
    - ✓ Footprint becomes more costly in refrigerated and frozen warehouses due to energy costs.

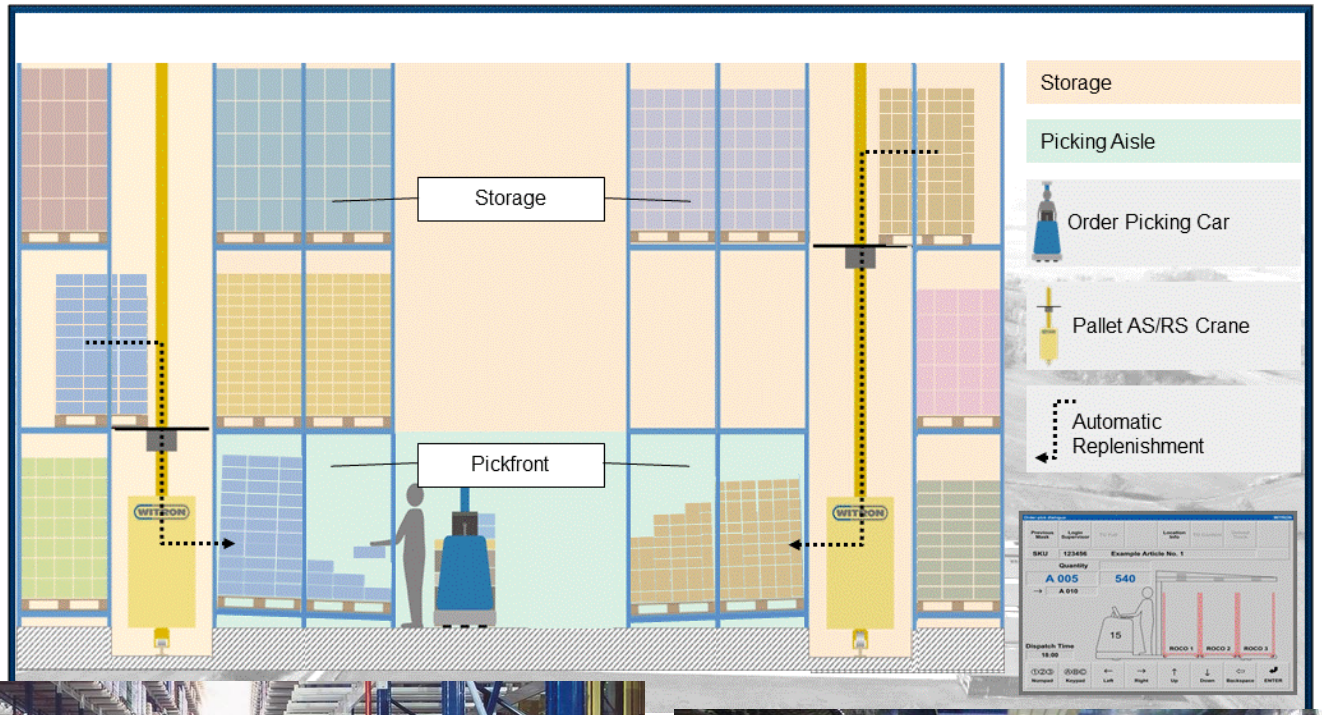
Levels of Automation



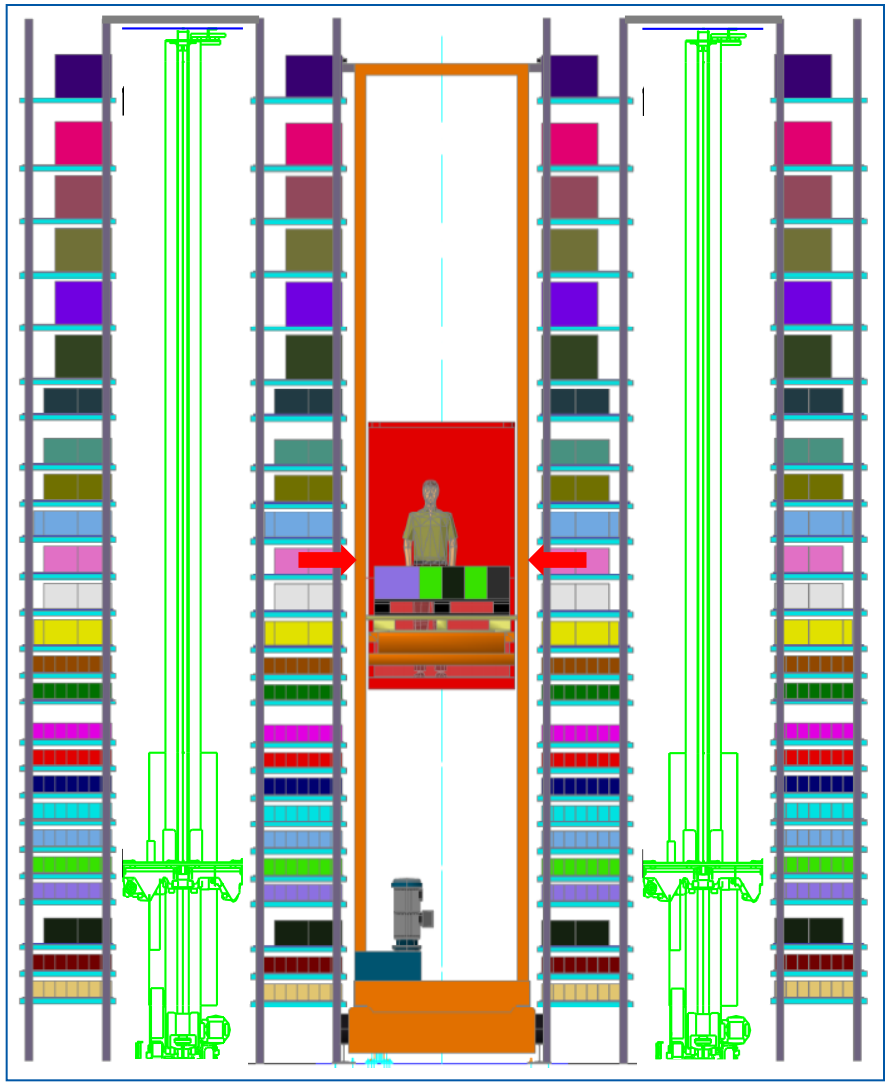
Conventional: Manual Picking, Manual Replenishment, IT Assist

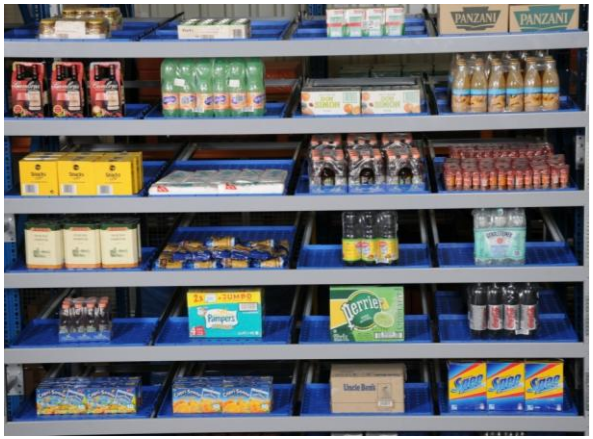
Low-Level Automation: Manual Picking, Automated Replenishment

Car
Picking
System



Medium-Level Automation: Manual Picking, Automated Replenishment





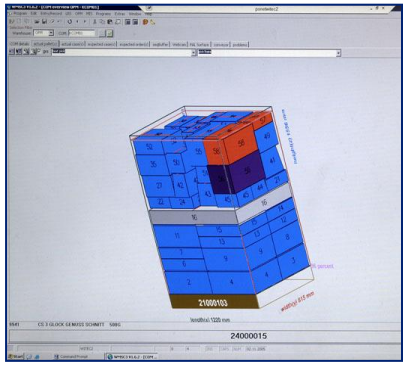
Ergonomic
Tray
Picking

Medium-Level Automation: Manual Picking, Automated Replenishment

Ergonomic
Tray
Picking

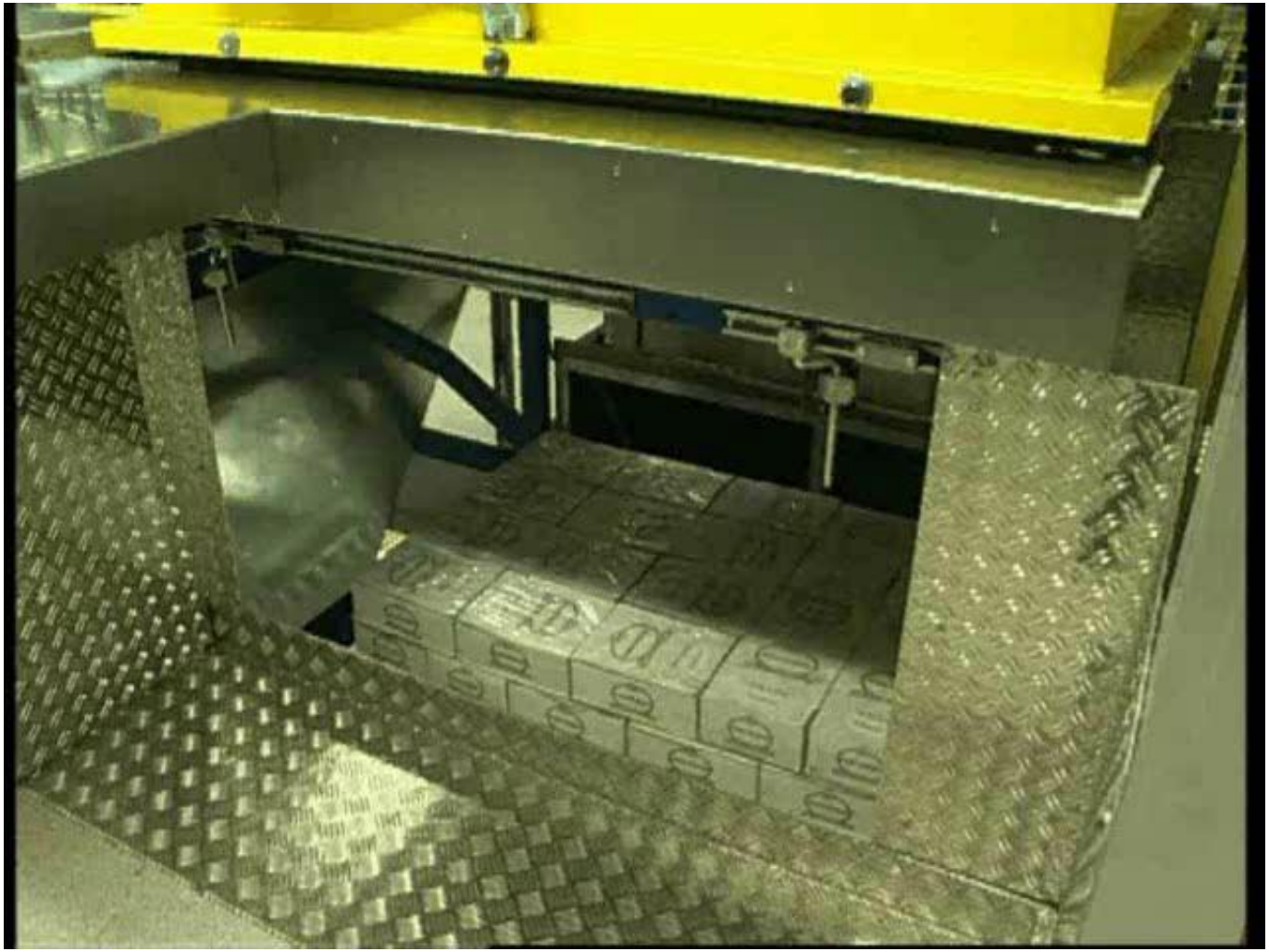
Full Automation: Automated Picking , Automated Replenishment

Order
Picking
Machinery



Full Automation: Automated Picking , Automated Replenishment

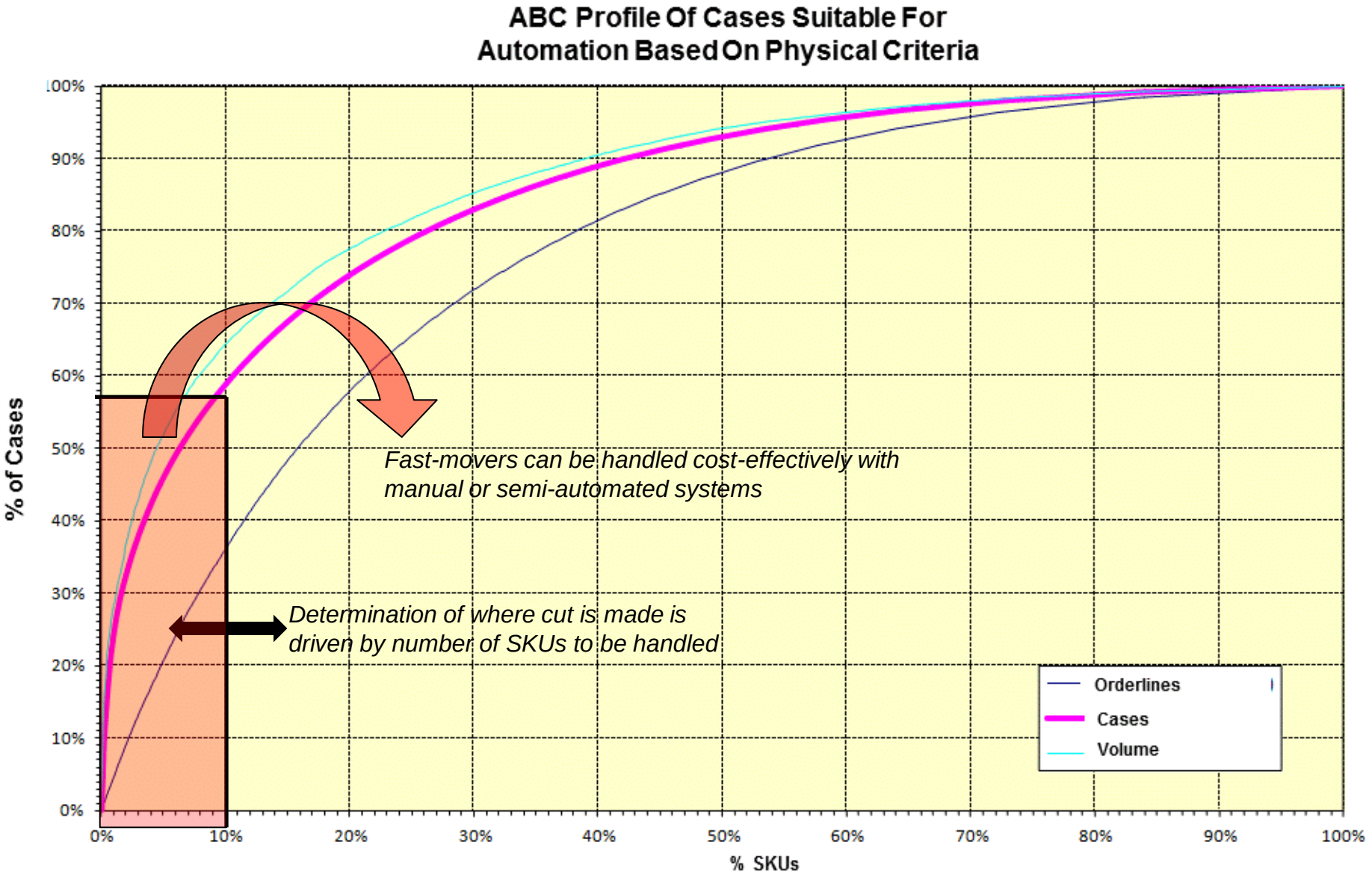
Order
Picking
Machinery



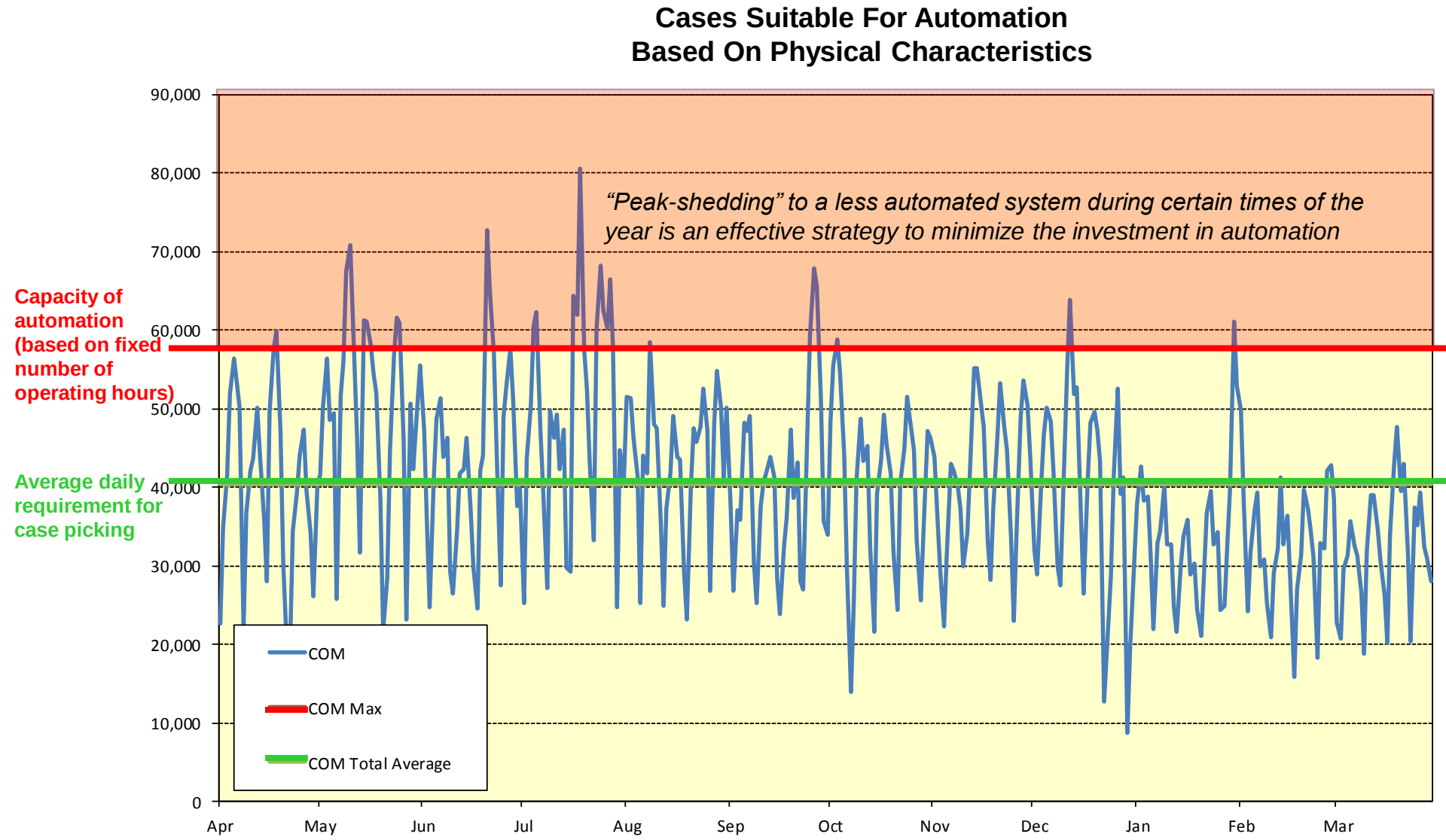
Typical Data Profiles For Different Automation Levels

OPM	• Because there is no “pickfront”, OPM is well-suited for applications with high SKU counts. • OPMs picking efficiency is not sensitive to the number of cases per orderline. • Investment requires a certain volume to insure a competitive cost per case. • Duration of picking should be such that asset utilization can be maximized. • One customer per order pallet allows the user to take maximum advantage of customer-friendly pallet building capabilities. • Cooled and frozen environments are excellent candidates based on ergonomic concerns.
ETP	• Well-suited for medium SKU counts (up to 4,000 SKUs) such that entire spectrum can be profiled in one ETP aisle. • Picking does not require lifting, so maximum ergonomics without full automation. • Not ideal for frozen environments.
CPS	• Low SKU count such that pickfront length is manageable. Layer tray option can be employed to handle medium SKU counts. • Ideal system when picks per orderline is high. • Preferable to conventional approaches based on automated put away, automated replenishment, and inventory holding capacity. • Flexibility to deal with peaks by adding pickers to the system.

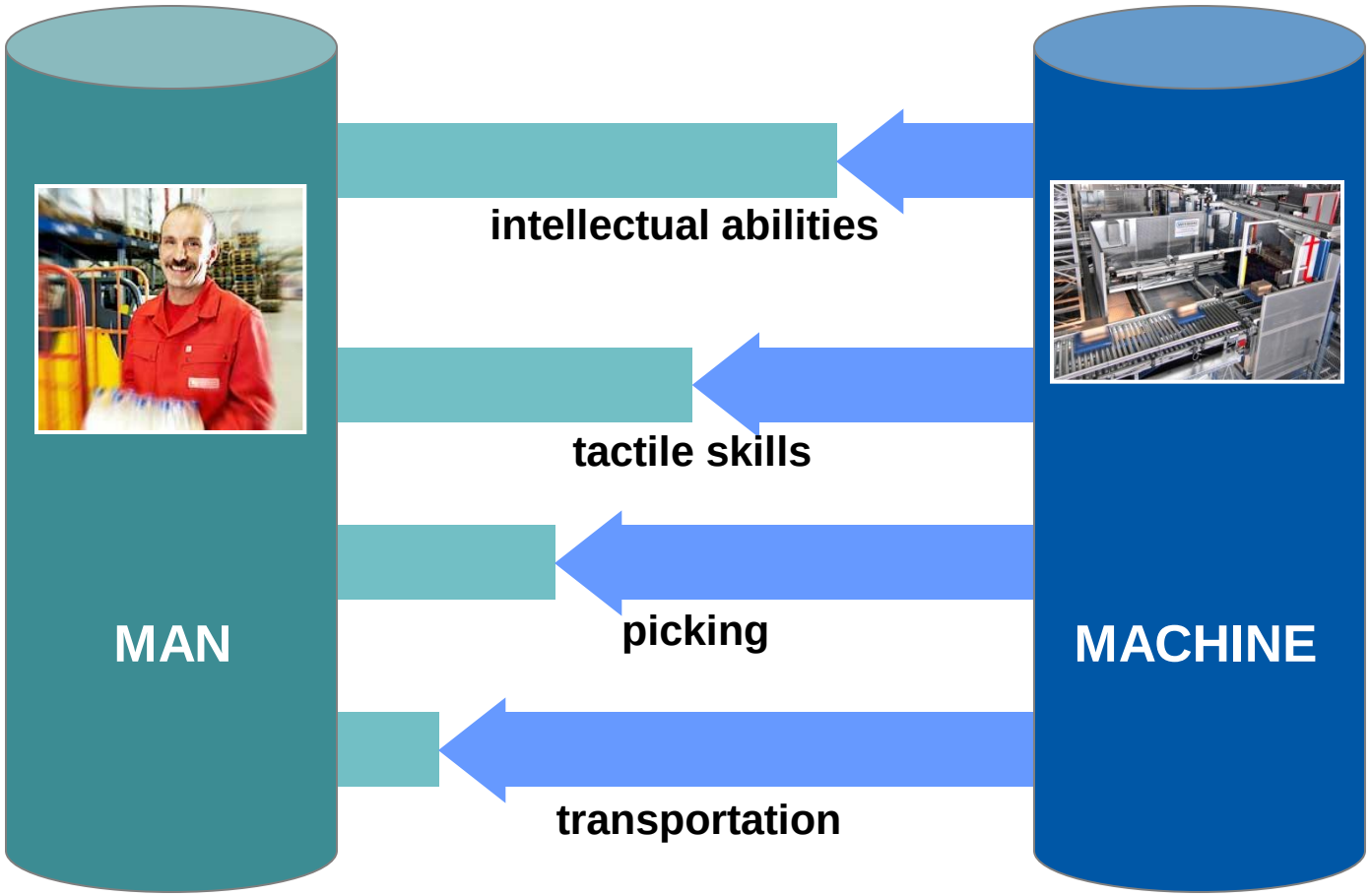
Different Automation Levels Within One DC



Different Automation Levels Within One DC



The Human Element, 1 Of 2



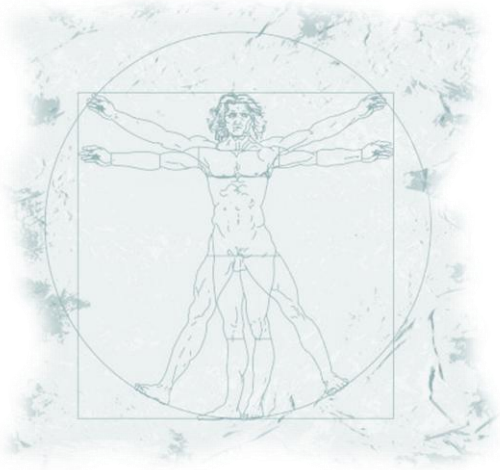
Within every system, even fully automated systems, designers must identify those tasks which are better suited to machines, and those where humans excel.

The Human Element, 2 Of 2

Warehouse tasks where manual approaches might be preferable to mechanization/automation, even in fully automated systems might include:

- **Trailer unloading**
  - ✓ Different trailer and load configurations might make automation challenging.
  - ✓ Generally speaking, every pallet needs to be manually handled anyway for inbound checking and processing.
  - ✓ Depending on the number of inbound trailers, financial justification might prove difficult.
- **Receiving**
  - ✓ Mixed-SKU pallets might require separation and sorting.
  - ✓ Quantity and/or quality checks might be required.
- **Product "preparation" (i.e. stretchwrap removal for automated case picking or repack for piece picking)**
  - ✓ Cutting must be done in a manner that doesn't damage the case contents.
  - ✓ Cut material requires removal and disposal.
- **QC inspection**
  - ✓ Qualitative factors require human consideration.
- **Trailer loading**
  - ✓ Different trailer and load configurations.
  - ✓ Different load sequences.

Even if manual, these tasks can be ergonomically designed for maximum effectivity and efficiency and minimal worker effort.



Automation does not eliminate all jobs…rather, automation removes those mundane and/or ergonomically challenging tasks, while creating new positions that are safer, more engaging, and more rewarding. Experience shows that automated operations have better employee retention rates, with employees reporting higher job satisfaction.

Conclusions

- **Identify the need for automation.**
  - Not every distribution operation requires automation.
  - Business demands, labor, environment, and strategic initiatives are some factors that drive the decision to automate.

- **Determine the proper level of automation.**
  - Different business segments and/or portions of the article spectrum might demand different levels of automation.
  - Sizing the automation might require compromise. Peaks might need to be managed with less automated approaches.

- **Within automation, consider which tasks need to be manual…and design those to be as ergonomic as possible.**
  - Human beings possess cognitive skills that make them superior for certain tasks.
  - Some tasks cannot justify the investment in automation.
  - Humans that interact with automated systems generally report higher job satisfaction than those working in purely conventional environments.

For More Information:

Speaker: Chris DeLisle

cdelisle@witron.com

Home Page: www.witron.com

Visit ProMat 2013 Booth 3914