FIND YOURS.

Forklifts to Robots
How to Find the Right Mix of Material Handling Automation

Presented by:
Toyota Advanced Logistics NA
Presenters

Alan Dotts
Sales Manager
Toyota Material Handling

Troy Donnelly
V.P. of Integration
Toyota Advanced Logistics

Adam Cole
National Account Manager
Bastian Solutions
A Toyota Advanced Logistics Company
Agenda

• The process for evaluating solutions
• Solution Levels
• Key indicators for automation evaluation
• Key indicators for solution levels
• Additional Considerations
• Key Takeaways
Don’t Pave the Cow Path

Take A Fresh Perspective Of Business Needs

What if?
Data Analysis

“A” Movers Picked From Pallets On The Floor.

“B” Movers Picked From 1,205 Lanes of Carton Flow

“C” Movers Picked From 2 ASRS PODS

“D” Movers Picked From Shelving

10 Day “Cube Per SKU Curve”
Applying Tactical Elements
Developing Layout Options
Solution Levels

- Manual Solutions
- Point Systems
- Integrated Systems
- Goods to Person
- Lights Out Operation

Level 1
Level 2
Level 3
Level 4
Level 5

FIND YOUR WOW
Key Indicators to evaluate solutions

- Hours of Daily Operation
- Process Standardization
- Throughput Requirement
- Velocity Volatility
- Business Forecast

1 Shift: LOW
2 Shifts: MEDIUM
3 Shifts: HIGH

FIND YOUR WOW
Level 1: Manual Operations

• Flexibility

- Hours of Daily Operation: 1 Shift (LOW), 2 Shifts (MEDIUM), 3 Shifts (HIGH)
- Process Standardization: 1 Shift (LOW), 2 Shifts (MEDIUM), 3 Shifts (HIGH)
- Throughput Requirement: 1 Shift (LOW), 2 Shifts (MEDIUM), 3 Shifts (HIGH)
- Velocity Volatility: 1 Shift (HIGH), 2 Shifts (MEDIUM), 3 Shifts (LOW)
- Business Forecast: 1 Shift (LOW), 2 Shifts (MEDIUM), 3 Shifts (HIGH)
Forklift Classifications

• Class I  Electric Powered Rider Types

  Stand-up Rider  3 and 4 Wheel Sit Down

Loading/unloading trailers; handling pallets. Electric means no emissions, minimal noise
Forklift Classifications

• Class II  Electric Motor Narrow Aisle

Straddle Type  Order Picker  Reach Truck  Side Loader  Side Loader  Turret Truck

Operating in tight spaces, handling pallets, picking/storing inventory
Forklift Classifications

- Class III Electric Motor Hand Pallet Trucks (walkie or rider)

Unloading deliveries from tractor-trailers; short runs in smaller Rider and walk-behind ("walkie") options
Forklift Classifications

- Class IV: Internal Combustion Engine Trucks (Solid/Cushion Tires)

Moving pallets from the loading dock to storage, vice versa
Cushion tires great for low-clearance situations
Forklift Classifications

• Class V Internal Combustion Engine Trucks (Pneumatic Tires)

Trucks can handle multiple pallets and in excess of 100,000 lbs. Mostly for outdoor use, but also indoors in large warehouses.
Forklift Classifications

- Class VI  Electric and Internal Combustion Engine Tractors

Commonly used for pulling loads rather than lifting; Example: airport “tugger” towing luggage carts
Forklift Classifications

- Class VII  Rough Terrain Forklift Trucks

Lumberyards/construction sites used to lift building materials. Some are equipped with telescoping boom and forks.
Level 2: Point Focused Solutions

• Suboperation Automation
Material Storage Solutions

- Racking and Storage Structures
- Mobile Storage
- Carousels / Vertical Lift Modules
- Deep Lane Shuttle
Material Movement Solutions

• Automated Guided Vehicles
• Conveyors
• Robotics
Level 3: Integrated Systems

• Primary operation automation
Integrated Systems Solutions

• Automated Storage and Retrieval Systems
• Pick Module Systems
• Sortation Systems
Level 4: Goods To Person

- Advanced Order Fulfillment Systems
Goods to Person Solutions

- Picking Throughput
- Response Time
- Expandability
- Operating Flexibility
- Storage Density

FIND YOUR WOW
Level 5: Lights out

• Key Indicators

- Hours of Daily Operation
- Process Standardization
- Throughput Requirement
- Velocity Volatility
- Business Forecast

3 Shifts | HIGH | HIGH | LOW | HIGH
Lights Out Solution
Additional Considerations

• Existing Infrastructure
  o Facility constraints
  o IT constraints

• Project Implementation
  o Project schedule
  o Project impact on existing operations

• Company Culture
  o Risk aversion
  o Existing Paradigms
Key Takeaways

• Your continuous improvement process should always consider manual and automated operations

• When considering automation for a process or operation “Don’t pave the cow path”

• Determining the appropriate mix of technologies will require data analysis and an associated business case

• Existing infrastructure, project implementation and company culture many times have significant impacts on process improvement direction
For more information

Troy Donnelly: Troy.Donnelly@Toyota-Logistics.com
Website: www.Toyota-Logistics.com

Alan Dotts: Alan.Dotts@TMHU.com
website: www.ToyotaForklift.com

Adam Cole: Acole@Bastiansolutions.com
website: www.Bastiansolutions.com

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