Automation, Integration & Energy Systems

Presented by:
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Meeting the Demand for Automation

- The world is moving towards more automation, why?
- What are its effects on our daily lives, and livelihood?
- Across many industries, why are companies considering a change to their manufacturing, warehousing or distribution operations?
The World Is Talking About Automation

WILL ROBOTS TAKE YOUR JOB?
Quarter Of U.S. Workers At Risk

Thursday’s report from the Washington think tank says roughly 36 million Americans hold jobs with “high exposure” to automation — meaning at least 70 percent of their tasks could soon be performed by machines using current technology.

Chefs And Truck Drivers Beware: AI Is Coming For Your Jobs

“Researchers at the McKinsey Global Institute suggests that, across industries, there is already the potential to automate more than 30 percent of the tasks that make up 60 percent of today’s jobs.”
The World is Changing to Automation

The impact is visible across many products, industry types and sectors.

<table>
<thead>
<tr>
<th>Automotive</th>
<th>Restaurants</th>
<th>Home</th>
<th>Manufacturing</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Self-driving</td>
<td>• Ordering</td>
<td>• Security</td>
<td>• Automotive</td>
</tr>
<tr>
<td>— Vehicles</td>
<td>• Cooking Systems</td>
<td>• Lighting</td>
<td>• Appliances</td>
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<tr>
<td>— Cars</td>
<td></td>
<td>• Doors</td>
<td>• Heavy Equipment</td>
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<tr>
<td>— Commercial</td>
<td></td>
<td></td>
<td>• Furniture</td>
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<tr>
<td>Vehicles</td>
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Warehousing & Retail Distribution

• Clothing
• Electronics
• Food & Beverage
• “SKU Explosion”
What is driving the need for automation?

Warehousing, Distribution & Manufacturing

- Access to a sufficient labor pool and scalability
- High cost of labor and related costs
- Supply chain optimization and process improvement
- Safety
Calculating Your ROI

Approximately 80% of the total cost of ownership is directly related to the “operator on board”.

<table>
<thead>
<tr>
<th>Capital Costs</th>
<th>Labor Costs</th>
<th>Cost Over 5 Years</th>
</tr>
</thead>
</table>
| **$40,000 (capital purchase)** | **$15.00 per hour**
2,000 hours per year
Single shift
Hourly rate x 35%
benefits / burden rate | ($40,500) x 5

- Damage
- Service
- Training
- Retraining
- Errors

**$40,000 one time**

$40,500 annually

$202,500

- Damage
- Service
- Training
- Retraining
- Errors

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**POWERED BY POSSIBILITIES.**
Automated Technology Solutions

Full Automation

Primary Uses
Routine, repeatable and predictable tasks

Example Technology
AGV Horizontal Transportation
AGV Stacking or Interfacing with Racking

Semi - Automation

Primary Uses
High storage density; Increased productivity

Example Technology
Warehouse Navigation
RFID Transponders
Implementing Automation Into Your Application

Processes typically have routine, predictable and repeatable movements.

Automation considerations:

- Loads / units being handled
- Volume or throughput
- Temperature
- Floor conditions
- Space requirements
- Number of shifts
- Labor content
- Warehouse Management Software (WMS)
AGV Safety Video

YouTube Link: https://youtu.be/FSyz57OfX0s
• Only a solid and stable integration makes your automation solution feasible
• In the world of the “Internet of Things (IoT)”, a Logistics Interface as middleware between the different Logistic Solutions is more important than ever
ERP system
(e.g. Manhattan®, SAP®, Microsoft Dynamics NAV®)

Warehouse Management System
(e.g. Jungheinrich WMS)

Fleet Traffic Management System
(FMS)

Material Flow Controller
(MFC)

Other systems (e.g. shipping, customs)

Process level

Middleware

Management level

Hardware

Logistics Interface
System Structure

Cloud or Server Based Compute engine: Traffic management and optimizations

Logistics Interface: Standard interface and Communication Center

Host System: Higher-level host i.e. WMS or ERP

User Interface: All information at a glance

Automated Guided Vehicles: Mobile communication Via wifi

Connections (PLC): Conveyors, doors, fire alarms, signal lights etc.

Order generation (PLC): Buttons, sensors, customer Specific interface etc.
The Logistics Interface is connecting systems!
Overview

1. Simple and efficient communication between hardware (forklift, shuttle, AGV, vertical lift system, etc.) and any ERP or WMS – Logistics Interface as IoT Connector

2. Intelligent and autonomous solutions – even without ERP or WMS – Logistics Interface as Process Manager
Logistics Interface as IoT Connector

- Runs de-centralized e.g. on Radio Data Terminals (RDT)
- Direct connection to the warehouse devices
- Connection to the WMS
- Carries out the tasks sent by the WMS
- No permanent data storage
Logistics Interface as IoT Connector

**IoT CONNECTOR**

- **Logistics Interface**
  - Turret Trucks and Order Pickers
  - Reach Trucks
  - Low Level Order Pickers and Tuggers
  - High Density Storage Systems
Logistics Interface as Process Manager

- Runs on the client’s server or in the Cloud
- LAN or Wi-Fi connection to the devices
- Connection to WMS or ERP
- Able to autonomously create orders and manage warehouse locations
- Can be used without host system
- Permanent storage of information in databases
Logistics Interface as Process Manager

Vertical Lifts

Automated Guided Vehicles (AGV)
Energy systems to meet your needs

Shorter charging times | Long-lasting | Less maintenance

Lead acid batteries capable of running two shifts on one charge

Lead-Acid Changing

Lithium Ion / Lead Acid Automated Charging
## Project Checklist

<table>
<thead>
<tr>
<th>Make sure to ask your vendor about ...</th>
<th>... to benefit from</th>
</tr>
</thead>
<tbody>
<tr>
<td>▪ Products: Standard vs. Custom</td>
<td>▪ Proven high-volume production models applied to customized application solutions</td>
</tr>
<tr>
<td>▪ Optional Energy Solutions (Lead-Acid vs. Li-Ion incl. automatic charging)</td>
<td>▪ Intermediate charging, no manual intervention, less maintenance</td>
</tr>
<tr>
<td>▪ IT integration</td>
<td>▪ Not being left alone to coordinate the systems</td>
</tr>
<tr>
<td>▪ Energy System: are you able to run two shifts on one charge?</td>
<td>▪ Big impact on ROI, energy efficiency = less cost and “green” image</td>
</tr>
<tr>
<td>▪ Service Network and Parts availability</td>
<td>▪ Guaranteed uptime, system reliability</td>
</tr>
<tr>
<td>▪ 24/7 Software Engineering Support</td>
<td>▪ Avoid wasting time in non-productive call centers</td>
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