Integrating Automated Guided Vehicles With SAP WM

Joe Knoblauch – Charmer Sunbelt Group
Deep Agnihotri – Charmer Sunbelt Group
LEARNING POINTS

- Alliance Distributors Overview
- Operational limitations in Manual Put-Away Process
- What Are Automated Guided Vehicles (AGV)
- Technical architecture and communication
- Video Demonstration
- Control screens
- Results so far
- Future Processes planned
- Questions
Alliance Distributors

- Charmer Sunbelt Group/ Glazers Corp Partnership
Alliance Distributors

- Charmer Sunbelt Group/ Glazers Corp Partnership
- Largest Wine and Spirits Distributor in Arizona
- 480,000 Sq. Ft facility.
- Average inventory 700,000 cases
- 50,000 cases per day received
- SAP implementation August, 2012
- AGV implementation September, 2012
Reduced Thru-put due to increased building size and forklift drive time resulted in increased labor expense.

Inconsistent storage practices has increased Breakage and Shrink.

Poor forklift handling and maintenance has lead to an increase in forklift/building maintenance expense.
WHAT IS AN AGV?

- Automated Guided Vehicle (AGV)
- Mobile Robot/Transport Unit
- Unmanned/Computer Controlled
- Real Time Monitored
- Battery Powered
- Intended to replace a person on a fork truck
- Excels at routine, repetitive material movements
Safe Operation

- Operates Safely with Pedestrian and Manual Vehicle Traffic
- Non Contact Obstacle Detection
Laser Triangulation

- Uses feedback from reflective “targets” mounted in the facility
- Updates vehicle position 40X per second
- Accurate vehicle positioning
- Flexible for future changes
- Proven performance
HOW DO AGVS WORK?

- Vehicles receive instructions from a computer (AGV Manager)
- 2 way communications with the computer is via RF/Wireless LAN
- Run on virtual guide paths that can be changed in software
- Guidance systems require little or no floor installation or modifications
- System controller typically provides:
  - AGV traffic management
  - Interface with WMS
  - Graphical user interface
  - Vehicle and system diagnostics
  - Client terminal and Web enabled access
WAREHOUSE LAYOUT

- **Warehouse Block Stacking**
  3 High
  13,653 Locations

- **Stationary Racking**
  126 Lanes 4 High
  504 Locations

- **Receiving Dock**
  39 Lanes
  312 Locations

- **Chiller**
  1 Lane 20 Locations
AGV Video Link
AGV CONTROL SYSTEM ARCHITECTURE

System Controls

- Warehouse Management System (WMS)
- ETHERNET HUB
- SYSTEM INTERFACE
- AGV Manager
- RE-LAN network
  IEEE 802.11B
- VPN Support

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• Microsoft Based Products
  – Visual C++, C#
  – IIS, ASP.Net (AJAX/WEB Services)
  – SQL Server Reporting Services
• Client / Server Configuration
• Network Control Interfaces
  – Web Services
• Relational Database Data Storage – MS SQL
• Windows Server
• Runs Under Microsoft Clustering and VMWare
• Standard, Modular “Off-The-Shelf” Products
Communication options available

- Application Web Interface (AWI)
  - With Process Integrator
  - Point to Point

- Application Database Interface (ADI)
Technical Architecture: Web Services

- Web Services Built
  - Master Data
    - Material attributes
  - Transactional Data
    - Receiving
    - Replenishment/Stock movement
    - Bin Sync
  - Signal
FEATURES OF AGV SYSTEMS

- Highly flexible/Easy to change
- Durable, expect a long service life
- Minimal infrastructure required
  - Ideal for automating existing warehouse & DC operations
- No single point of failure
- Expect high utilization and uptime
- Strong ROI for multi-shift operation
Graphic Interface
### SGV Status - SGV

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<tr>
<th>SGV</th>
<th>Order ID</th>
<th>Zone</th>
<th>Location</th>
<th>Floor</th>
<th>Node</th>
<th>Status</th>
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</table>
BENEFITS OF AGV SYSTEMS

• Reduce labor costs
• Reduce product damage
• Reduce/Eliminate errors
  - Right product to the right location at the right time!
• Improve productivity
• Reduce facility damage
• Track product movement
• Improve safety
Future Potentials

- Working on process where AGV units will be used for picking/loading of bulk loads.

- Enhancement of Replenishment.
Questions
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