

# Warehouse Management Systems 2020: That Was Then – This is NOW.



POWERED BY **POSSIBILITIES.**

 **Softeon**

Presented by:

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# Presenters



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# WMS Market Remains Very Active

## Drivers of New WMS Projects:

- New Facility
- Companies Experiencing Rapid Growth
- Companies Making Significant Logistics Strategy Changes
- Companies Consolidating Facilities
- Companies Significantly Increase DC Automation
- Rising Distribution Costs
- Current WMS Technology is Really Old (“Burning Platform”)
- New Omnichannel Fulfillment Requirements
- Interest in Cloud-based System

# Exciting New WMS Capabilities are Emerging

- 20 Years of Only Incremental Improvement in WMS Capabilities
- Market is Ready for Something New



# Five Exciting New WMS Trends

- WMS in the Cloud
- Use of Templates and Wizards
- Integrated Support for Picking Sub-Systems
- Conversational Voice
- WMS + WES

# #1: WMS Moves to the Cloud

- Despite Late Start, WMS Moving Rapidly to the Cloud
- Gartner: “By 2020, over 90% of Spending on Supply Chain Execution Systems will be for Cloud-based Solutions”
- Underlying Architecture Key to Flexibility
- Cloud, On-Premise, Hybrid
- Smart Mobile, Optimized RF Communications



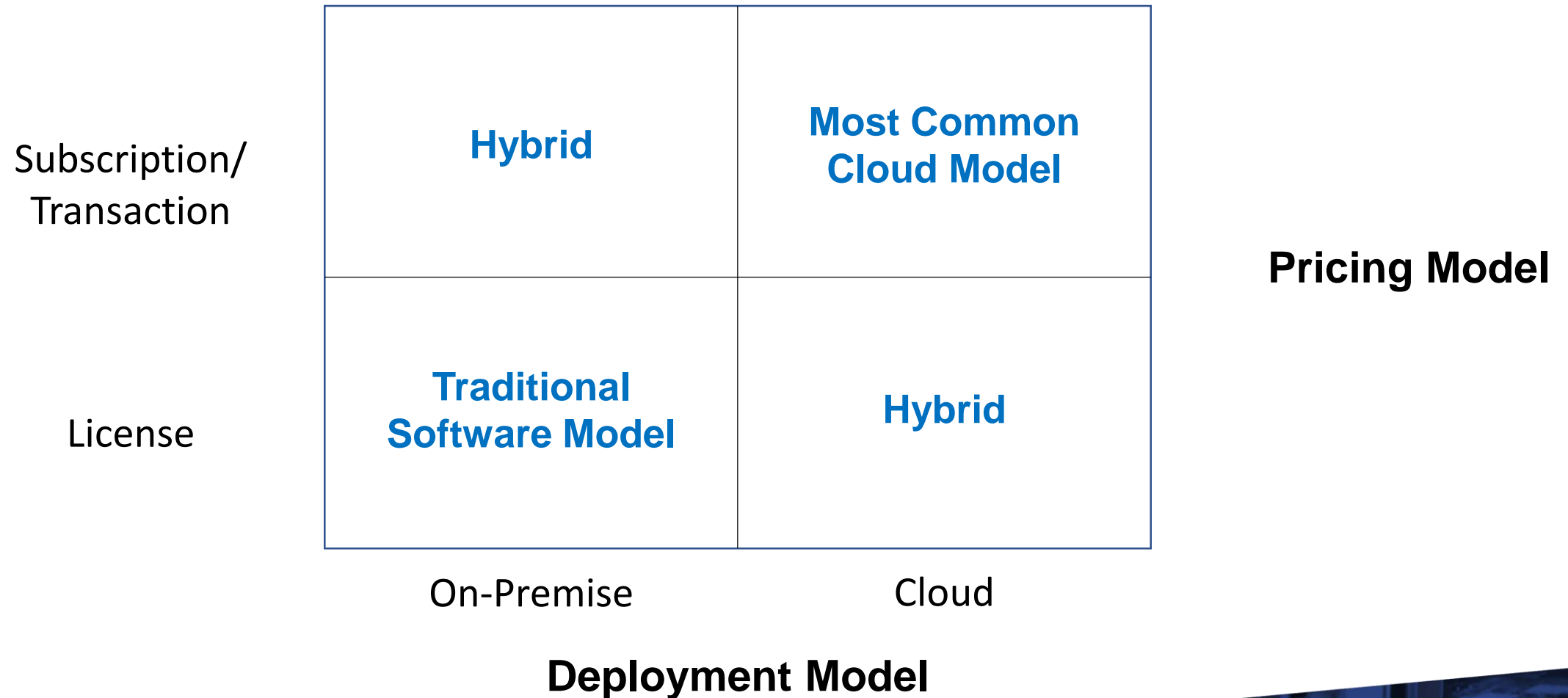
# Understanding Pricing and Deployment Options

Subscription/ Transaction		
License		
	On-Premise	Cloud

**Deployment Model**

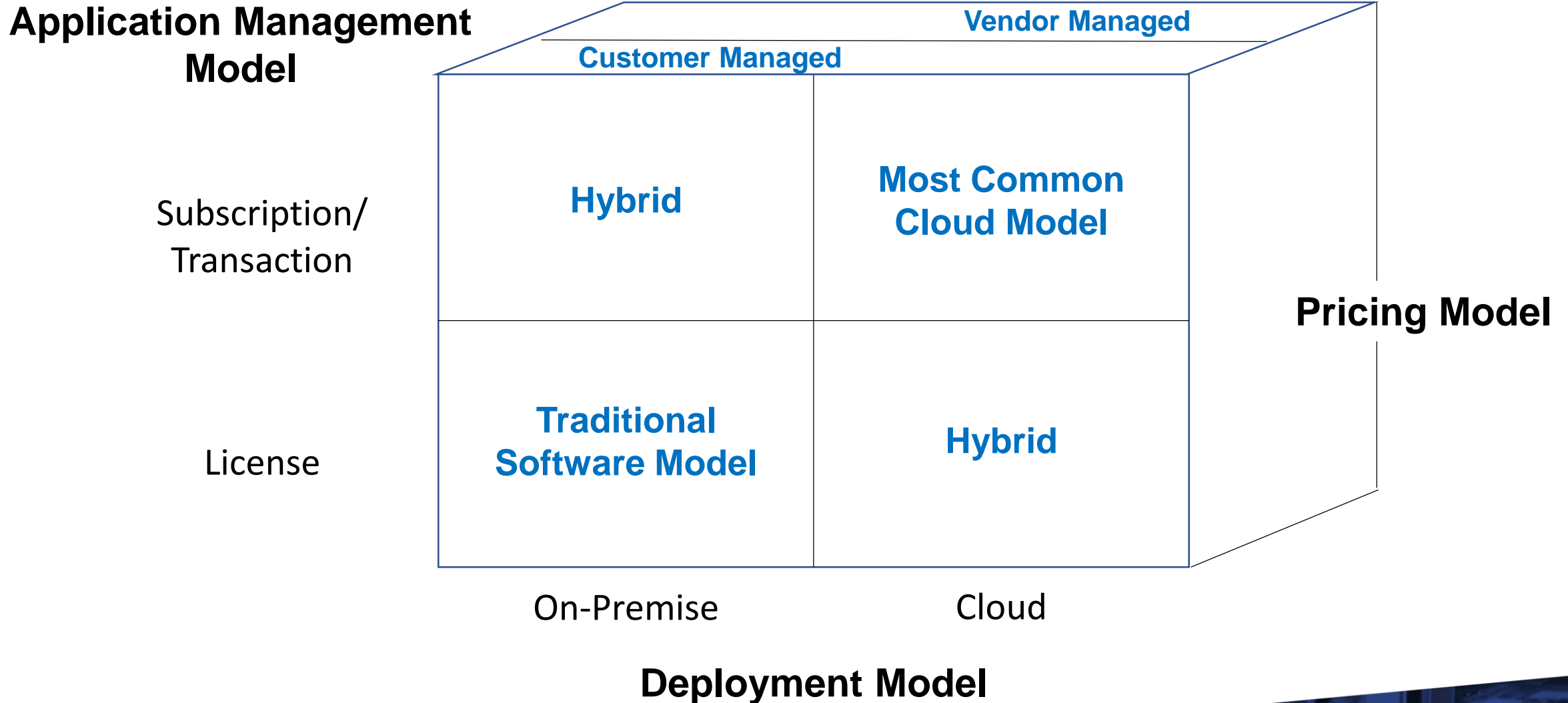
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# Understanding Pricing and Deployment Options



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# Understanding Pricing and Deployment Options



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# WMS Moves to the Cloud

**The Promise: Varied Distribution Network – One WMS Solution**

**Move from On-Premise to Cloud with No Data Migration**

Large DC  
On-Premise

Large DC  
On-Premise

Mid-Size DC  
On-Premise

Mid-Size DC  
Cloud

Small DC  
Cloud

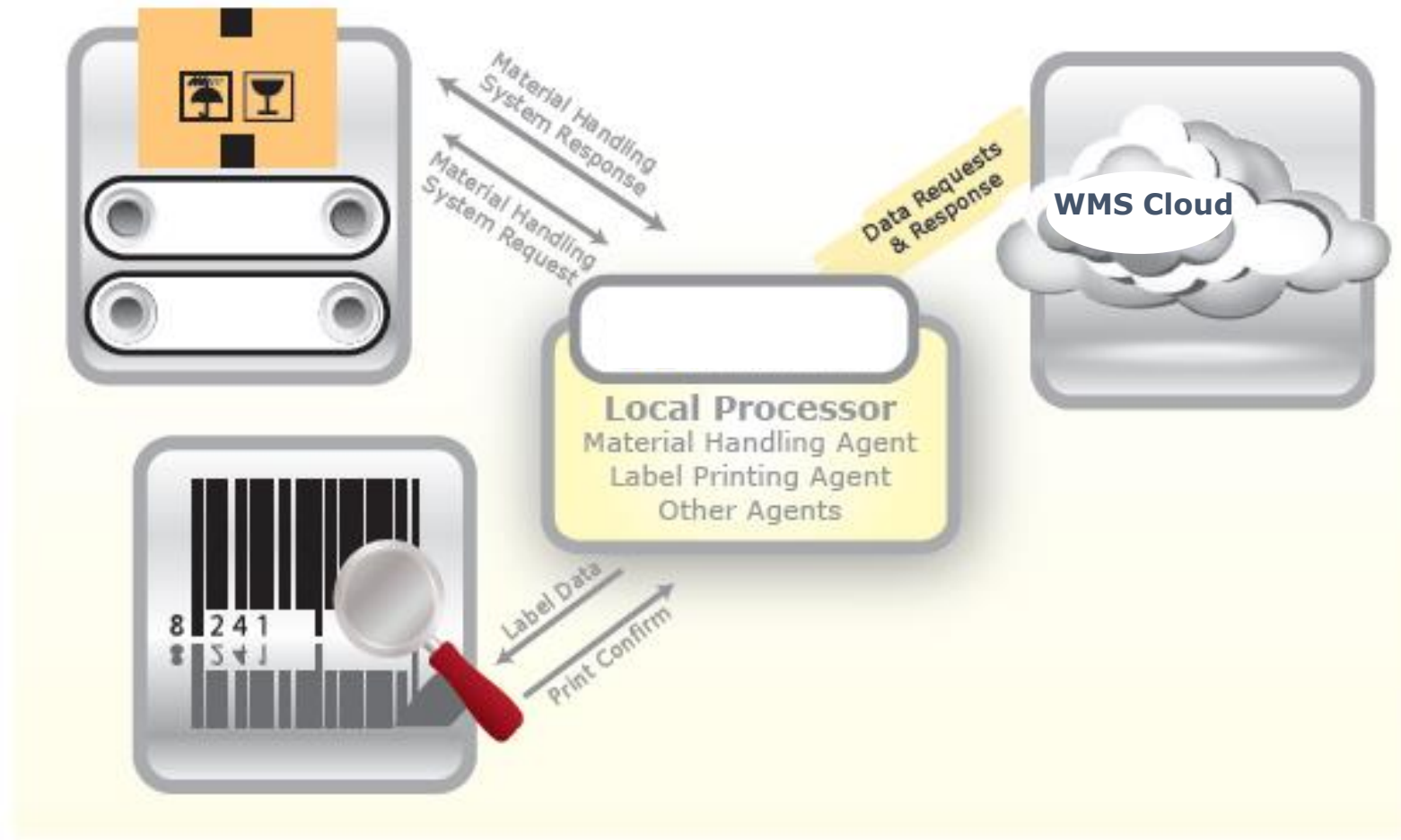
Small DC  
Cloud

Remote DC  
Hybrid

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# WMS Moves to the Cloud



**Support for Hybrid  
Deployment**

# # 2: Use of Templates and Wizards to Transform WMS Deployment

- WMS Deployments Remain Very Difficult, Costly and Risky
- Many WMS Providers have tried Using Templates - Never Worked Very Well
- Now - New Approaches that Not Only Reduce Effort/Costs - Prevent Mistakes

SCFEXLITE 5.3.0

Bootstrap Template Warehouse Management System

**Building Template Features**

Dock Doors ☒ Stage Locations ☒ Zone Setup ☒ QC Locations ☒  
Location Formats ☒ Receiving Docks ☒ Return Locations ☒ User Groups ☒  
Location ☒

**Business Unit Template Features**

**Receipts**

RCV Dock avail. for Order processing ☐ Blind Receipt ☐ PO Receipt ☒ Receive Product not in PO ☐  
ASN Receipt ☒ Overage Allowed ☐ QC Inspection on Receipt ☒

**Inventory Tracking**

FIFO ☒ Serial No. Tracking Inbound ☒ Unit Level Serial No. ☒ Case Level Serial No. ☒  
Lot Code Tracking ☐ Manufacturing Date ☐ Serial No. Tracking ☒ Expiry Date ☐  
Serial No. Tracking Outbound ☒

**Order Processing**

Batch No. Tracking ☒ Outbound QC required ☒ Commercial Invoice ☒ Each Pick Allowed ☒  
Parcel Integration Required ☒ Consolidate Order by Customer ☒ Multi Shipment allowed for an order ☐ Case Pick Allowed ☒  
Packing Slip ☒ Shipping Documentation ☒ Pallet Pick Allowed ☐

Submit Back

MINNESOTA SCFEXLITE 5.3.6

Configuration Wizard

01-MINNESOTA DC

Business Unit 01 - ABC Logistics

Hide Inactive ☒ Back Complete All

20 out of 21 completed

Screen Name	Status
User	<input checked="" type="checkbox"/>
User Preference	<input checked="" type="checkbox"/>
Business Unit Warehouse Map	<input checked="" type="checkbox"/>
Menu Access	<input checked="" type="checkbox"/>
SKU Profile	<input checked="" type="checkbox"/>
SKU Groups	<input checked="" type="checkbox"/>
Aisle Creation	<input checked="" type="checkbox"/>
Zone	<input checked="" type="checkbox"/>
Zone Type (Mapping)	<input checked="" type="checkbox"/>
Location Format Type	<input checked="" type="checkbox"/>
Zone Loc	<input checked="" type="checkbox"/>
Location Relative Sequence Generation	<input checked="" type="checkbox"/>
Putaway Preference	<input checked="" type="checkbox"/>
Door	<input checked="" type="checkbox"/>
Carrier Setup	<input checked="" type="checkbox"/>
Customer	<input checked="" type="checkbox"/>
Stage Lane	<input checked="" type="checkbox"/>
Pick Route Determination	<input checked="" type="checkbox"/>
Printer	<input checked="" type="checkbox"/>
Upload Process	<input checked="" type="checkbox"/>
Dashboard	<input checked="" type="checkbox"/>

**Pick Route Determination**

Cust Bus. Type  Cust Bus. SubType  Preference Type   
Ref ID1  Ref ID2  Order Sub Type   
Ref ID4  Ref ID5

☐ Quantity ☐ Percentage ☐ Value From  -  UOM

Pick Type  Pick Route   
Bldg ID  Pref Seq #

Submit Delete Reset Find Refresh

Cust Bus. Type	Pick Type	Preference Type	Pref Seq #	Pick Route	Building	From Qty	To Qty	UOM
B2B-B2B	CASE PICK	ONLINE	1	CP	01	0	0	
B2B-B2B	CASE PICK	ONLINE	1	CP	01	0	0	
B2B-B2B	CASE PICK	ONLINE	1	CP	01	0	0	
B2B-B2B	LOOSE PICK	ONLINE	1	LP	01	0	0	
B2B-B2B	LOOSE PICK	CLUSTER	1	CLP	01	0	0	
B2B-B2B	LOOSE PICK	CLUSTER	1	CLP	01	0	0	
B2B-B2B	LOOSE PICK	CLUSTER	1	CLP	01	0	0	
B2B-B2B	LOOSE PICK	ONLINE	1	LP	01	0	0	
B2B-B2B	LOOSE PICK	ONLINE	1	LP	01	0	0	
B2B-B2B	PALLET PICK	SE	2	PP	KB	0	0	
B2C-B2C	LOOSE PICK	CLUSTER	1	CLP	01	0	0	
B2C-B2C	LOOSE PICK	CLUSTER	1	CLP	01	0	0	
B2C-B2C	LOOSE PICK	CLUSTER	1	CLP	01	0	0	
D-Distributor	CASE PICK	COMPANY NO	1	CP	EON12	0	0	
D-Distributor	CASE PICK	COMPANY NO	1	CP	EON12	0	0	
D-Distributor	CASE PICK	COMPANY NO	1	CP	EON12	0	0	
D-Distributor	CASE PICK	SKU_GRP1	1	BCP	01	0	0	
D-Distributor	CASE PICK	SKU_GRP1	1	BCP	01	0	0	
D-Distributor	CASE PICK	ONLINE	1	CP	01	0	0	

# # 3 – Integrated Support for Picking Sub-Systems

- High Interest in a Variety of MHE Technologies
  - High Automation
  - Mid-Level Automation: Voice, Smart Carts, Pick-to-Light, Put Walls, Mobile Robots, etc.
- Current Approach is Limited
  - Throw Orders “Over the Wall” to Sub-Systems, Receive Confirmations Back
  - Limits Flexibility, Optimization and Exemption Handling
- A Better Way has Emerged

# Each Sub-system with its Own Control Software

Voice Server  
*Order Release  
Logic*



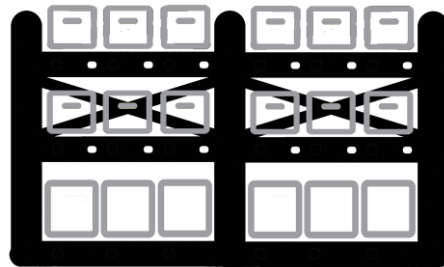
Voice  
terminals

Pick Cart  
Control System  
*Order Release  
Logic*



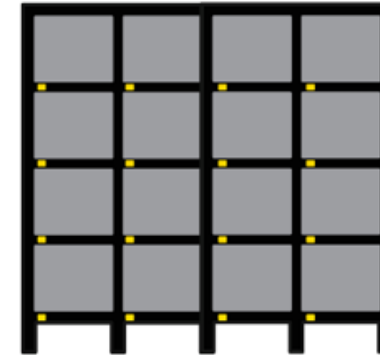
Smart carts

PTL  
Control System  
*Order Release  
Logic*



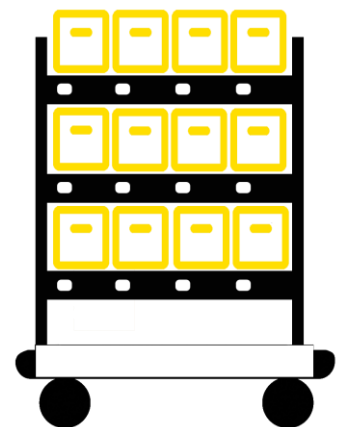
Pick-to-light

Put Wall  
Control System  
*Order Release  
Logic*



Put walls

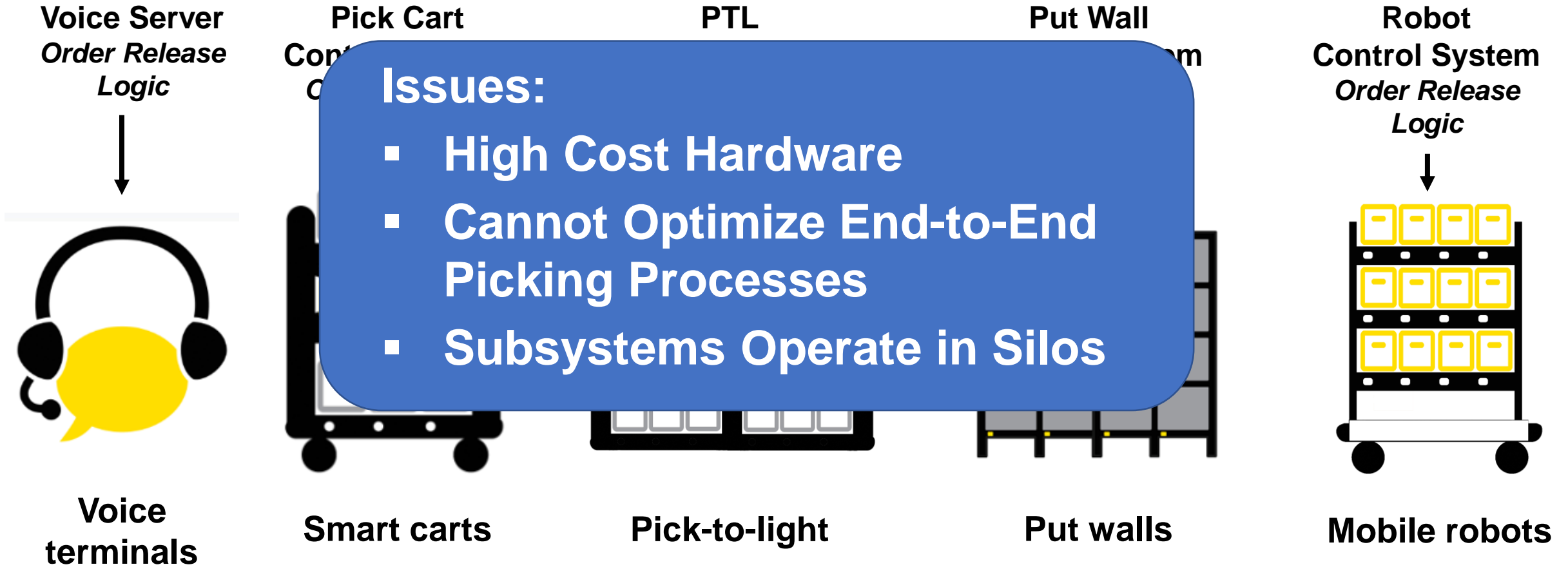
Robot  
Control System  
*Order Release  
Logic*



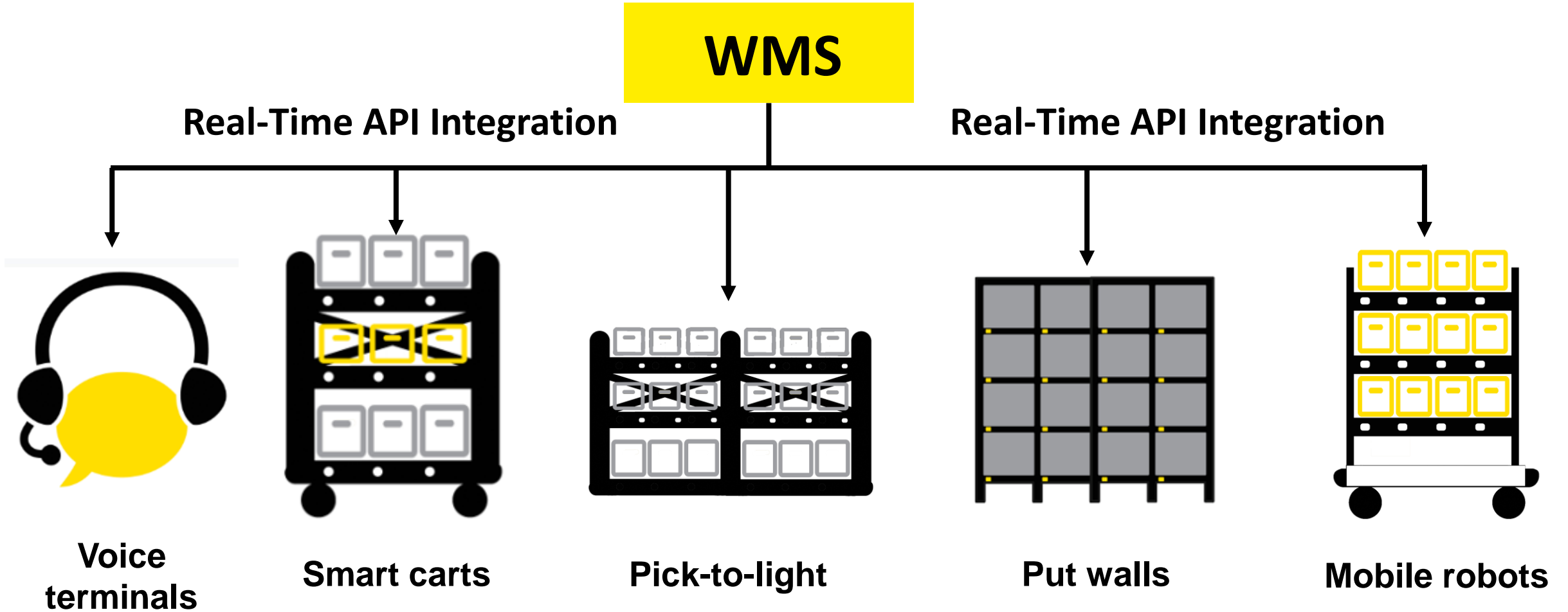
Mobile robots

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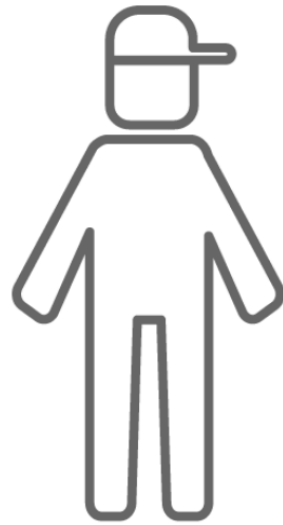
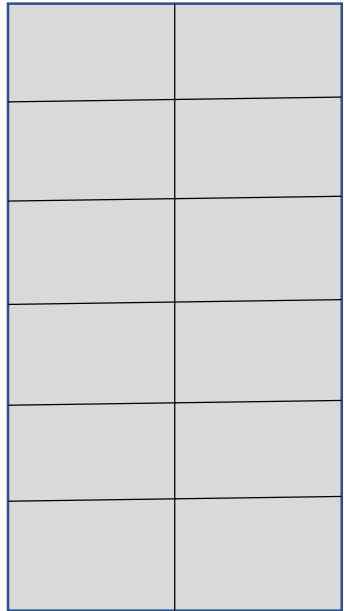
# Each Sub-system with its Own Control Software



# The Better Way



# Example: Robotic Helper Task

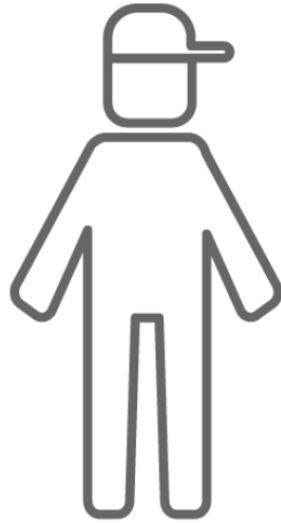
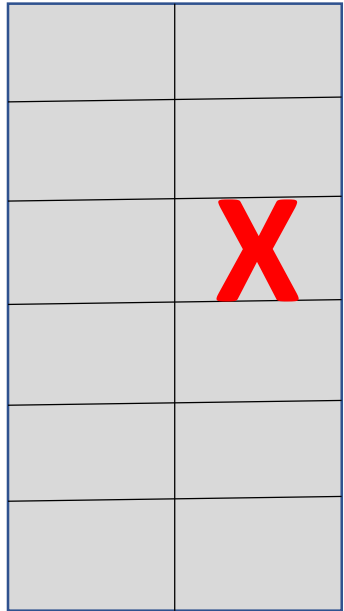


Picker 1



**Scenario: Piece Picking from Forward Pick Areas Only**

# Example: Robotic Helper Task



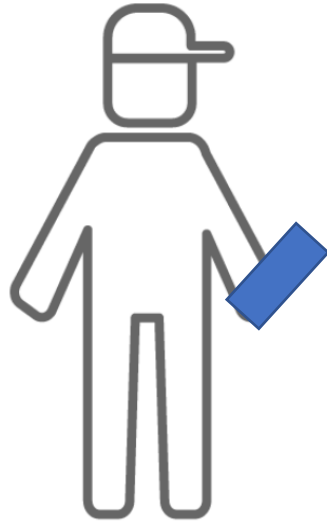
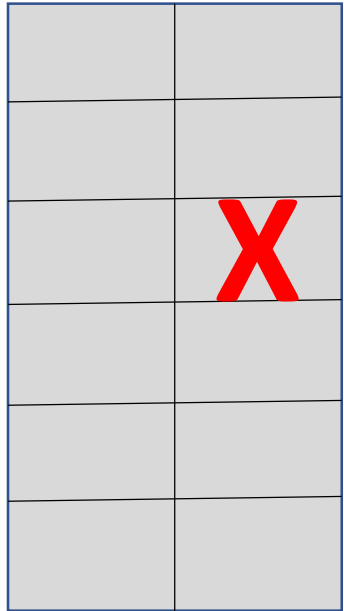
Picker 1



1

- Picker Arrives at Pick Location
- Expected Inventory not There
- Cluster Picks for One or More Orders Must be Skipped
- Can be “Short Picked” or Skipped

# Example: Robotic Helper Task

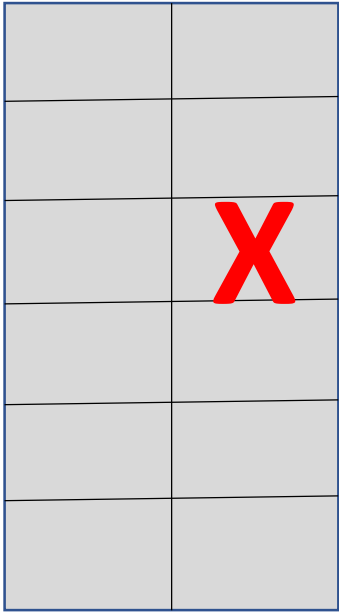


Picker 1

2

- System Generates High Priority Cycle Count
- Associate Confirms Inventory Shortage
- High Priority Replenishment Task is Generated

# Example: Robotic Helper Task

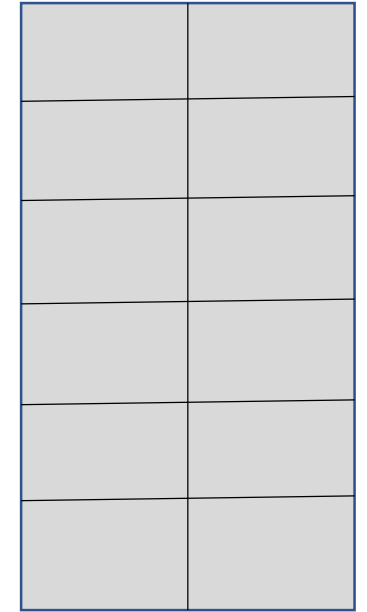


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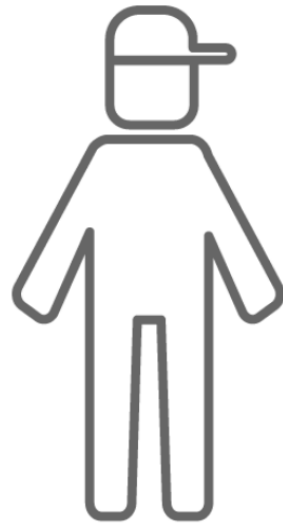
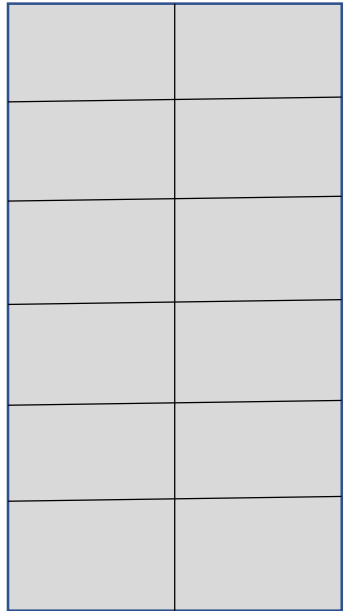
- Picker Works on Remaining Picks
- If Complete, Picker Takes Totes to Packing, where Totes with Missing SKUs are Directed to “Hospital” Area



Picker 1



# Example: Robotic Helper Task



Picker 2

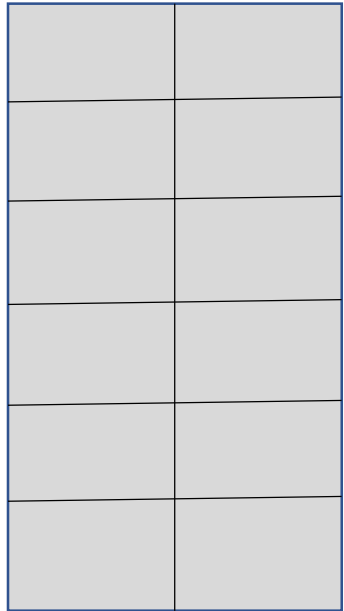


4

- Original Picking Location is Replenished

# Example: Robotic Helper Task

5



Picker 2

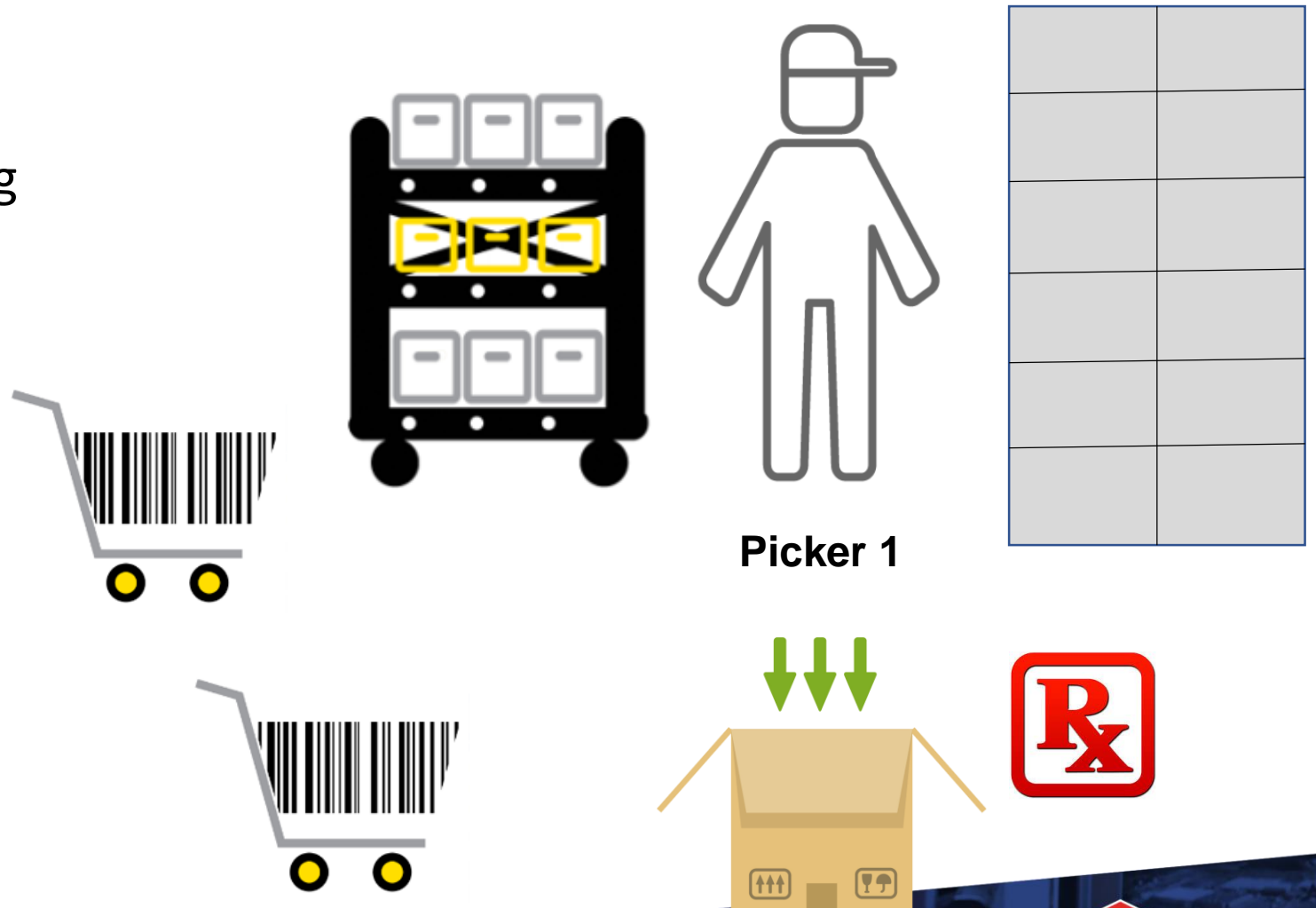


- Robot Arrives at Original, Now Replenished Forward Pick Location
- As New Picker Approaches Location, He/She is Given a New Task – Pick the Shorted Item and Put on Robot
- Robot Match Confirmation RTLS
- The “New Task Interleaving”

# Example: Robotic Helper Task

6

- Mobile Robot Takes Missing SKUs to Packing Hospital Zone, where they are Packed to Complete the Orders
- Alternatively, Robot Can Meet the Picker in Route if Picks are not Complete



# Substantial Benefits from this Approach

- Use of Commodity Hardware for Carts, Walls and Lights Reduces Costs by as Much as 70%
- Put in your pocket, or add more carts/walls/light systems
- Use of Smart Phones and Voice App Saves Thousands of Dollars Per Unit
- Elimination of Interfaces to 3<sup>rd</sup> Party Software Simplifies Implementation and On-Going Maintenance, Reduces Costs
- Advanced Order Planning and Dynamic Release Drives Double Digit Productivity Gains
- Integrated Picking and Packing System Provides Operational Flexibility
- Customer Can Leverage What They Have, Add-On with Complete Modularity



# # 4 – The Rise of Conversational Voice

- Use of Voice Beyond Order Picking
- Starts with Metrics and Status Update
- Evolved to more Full Blown Dialog

# Will be the Primary Way Users Interact with the WMS

***“I need a replenishment for Location CD05N2.”***



***“Where are we on the last wave?”***



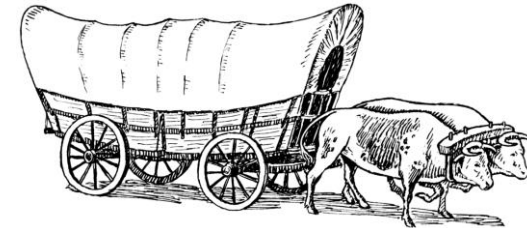
# # 5 – The Integration of WMS and WES

- Warehouse Execution Systems (WES) Move Beyond Current Applications in Heavily Automated DCs
- Rise of the Warehouse Management and Execution System
- Simulation, Optimization and Orchestration
- Step Change in WMS Capabilities
- Headed to the New Era of the “Autonomous WMS”

# How We Got Here

**WMS**

**WCS**



# Some Implementations

**WMS**

**WCS**



## Why?

- Lack of WMS Capabilities
- MHA Vendor in Control of Customer
- Agreements between WMS and WCS Vendor

# New Dynamic in Some Scenarios

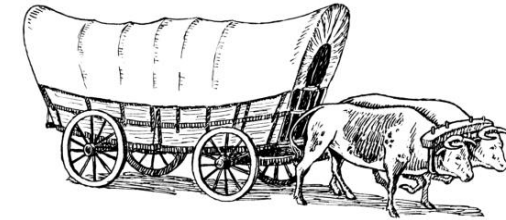
**WMS**



**WES**



**WCS**



## Why?

- WES only Developed Due to Perceived Shortcomings in WMS
- True for Some, not for All
- Visibility to Process/Work Area Status
- Flow of Work Based on Capacities and Work Load
- “Waveless” Processing

# WES Addresses Common Distribution Problems/Opportunities

- Lack of Granular Visibility to Throughput and Order Execution
- Labor Planning Challenges
  - Right Resources not in Right Place at Right Time
- Time/Cost/Approach of Adding Technologies (e.g., Picking Sub-Systems)
- Sub-Optimal Picking Execution
- Difficulty Meeting Carrier Cut Off Times/Ensuring SLAs
- High Variability in Materials Handling Equipment Utilization
- WMS Still Highly Reliant on Human Decision-Making

# Fundamental New WES Value Proposition

- Enables Companies to Meet Customer Demand and Service Commitments at the Least Possible Cost
- Significantly Shrinks the Gap Between Theoretic and Realized DC/System Throughput
- Single System for Management and Control of Fulfillment Across the DC
- Integrated with WMS for Complete Solution
- Automated, Manual or Hybrid DCs

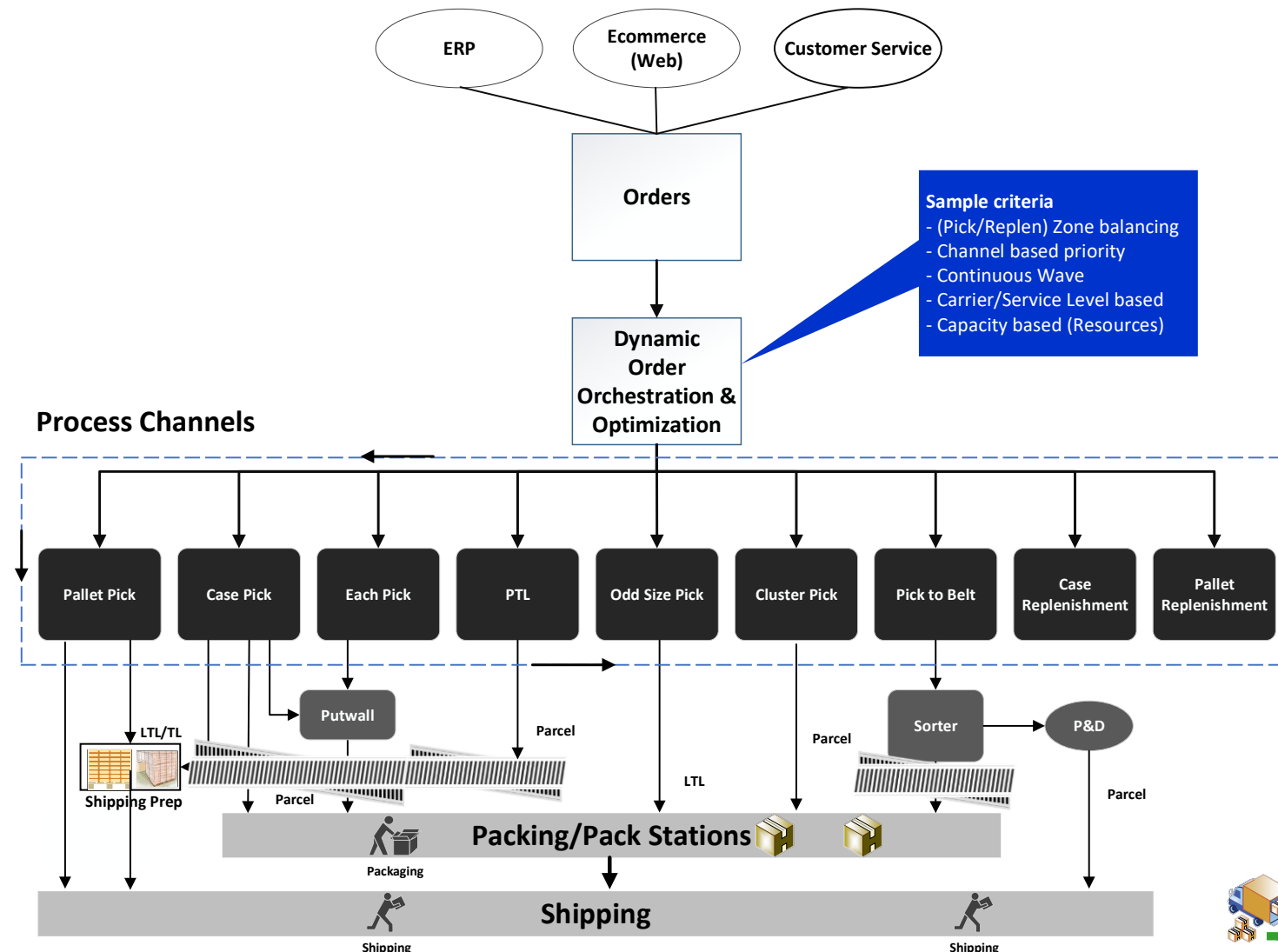
# How WES Delivers Results

- Real-Time Visibility to Throughput, Bottlenecks and Events
- Direct Management and Optimization of Picking Sub-Systems
- Advanced, Configurable Optimization for Order Batching, Release, Picking and Replenishment
- Workload Balancing to Maximize Equipment Utilization and Flow
- Automated Order Release Based on Service Commitment, Shipping Schedules and Real-Time Condition Monitoring
- Use of Simulation to Plan, Re-plan and Allocate Resources

# Dynamic “Aware” Pick Release Management

**Condition and Event Monitor**

**Advanced Scheduler**



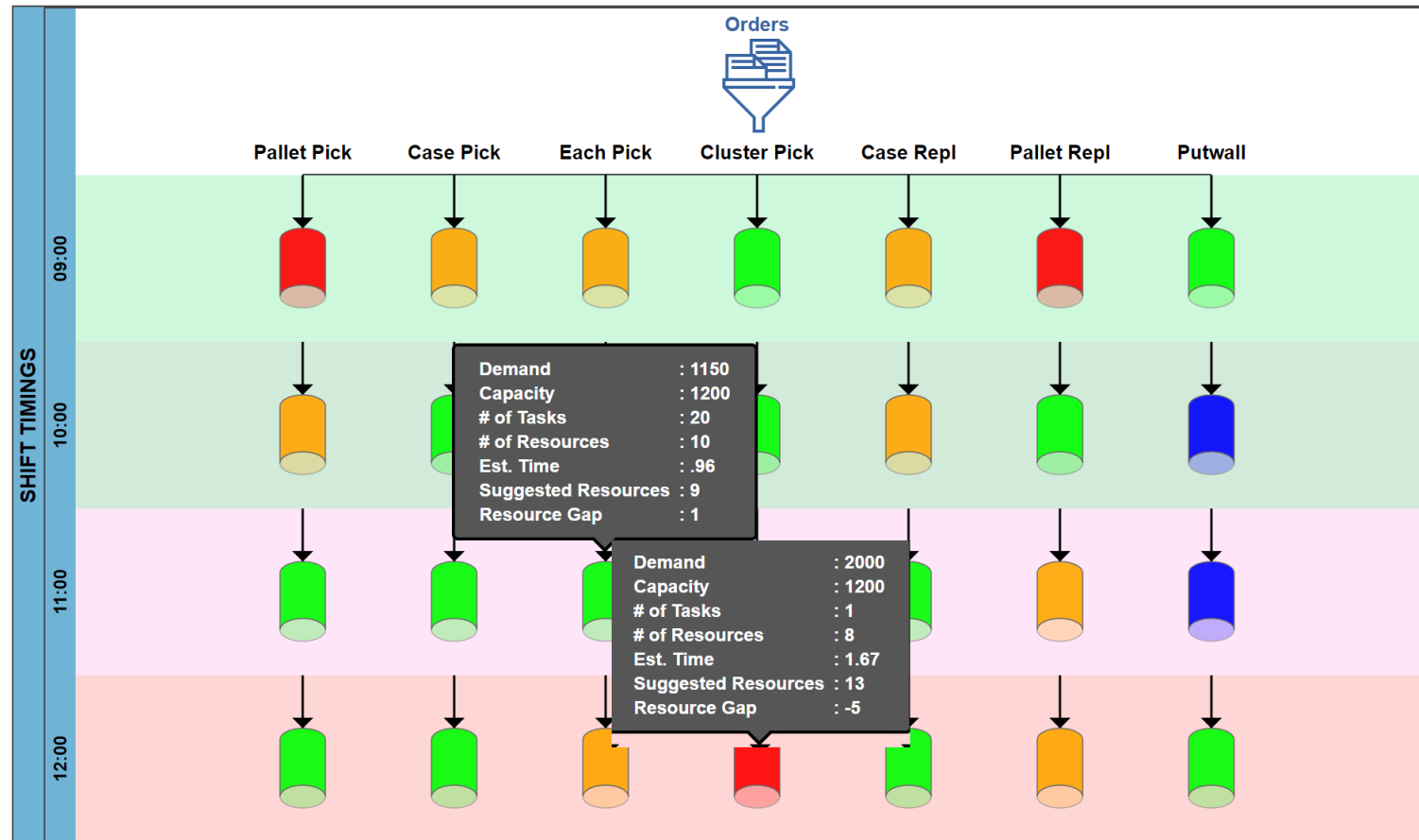
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# Demand v/s Capacity Dashboard from Simulation



# Dynamic Capacity Management Using Simulation



# Benefits of Next-Generation WES

- Double Digit Improvement in Labor Productivity
- Significant Reduction in Supervisory Overhead
- Reduced/Better Managed Overtime
- Improved Throughput
  - Closing Gap between Theoretic and Actual Throughput of a Facility
- Easily and Quickly Evaluate and Deploy New Sub-Systems/Technologies
- Consistently Meet Service Commitment with Little “Chaos”
- Improve MHE Utilization
  - Additional Throughput or Reduce Required Capacity

**Benefits Applicable to Automated, Manual and Hybrid DCs!**

# Where We Are Headed

- **Beginning of an Era of Autonomous Warehouse Software**

- Automated Decision-Making
- Self-tuning (in part through use of AI/ML)

- **Advanced Focus on Product and Process Flow**

- Reduce/Eliminate Process Bottlenecks and Dwell Times
- Flow Distribution™

# Q + A

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