

A Roadmap to Developing Modular, Scalable and Flexible Solutions

Presented by:

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POWERED BY **POSSIBILITIES.**



powered by  MHI

Who we are

Kuecker Logistics Group-

- End to End Supply Chain Solutions Provider since 1980
- Experience in e-commerce, retail and wholesale distribution
- Solutions across many markets including apparel, footwear, hardware, convenience, cosmetics, pharmaceutical, meat packaging, food and beverage, 3PL, etc.
- Work with multiple equipment manufacturers and suppliers to create best of breed solutions
- Provider of supply chain systems- Keychain WCS and WES
- Supply chain consulting services including Network Analysis, Process Development, Facility Design and Engineering Services

Speakers-

Daryl Bush (20 Years of Industrial Engineering and Operations Experience)

Dick Hutson (38 Years of Material Handling Systems and Consulting Experience)

WHAT ARE YOUR CHALLENGES?

- RETAIL AND ECOMMERCE BUSINESS ENVIRONMENT
- INTERNAL BUSINESS PRESSURES
- LABOR AVAILABILITY
- BUSINESSES ARE EXPANDING INTO YOUR MARKET
- OFFERING VARIOUS VALUE-ADDED SERVICES
- FUTURE E-COMMERCE LANDSCAPE AND EXPECTATIONS

WHERE ARE YOU TODAY?

CAN YOU HANDLE AND SUPPORT OR.....?

CAN YOU BE AN ENABLER FOR THE BUSINESS?

POWERED BY POSSIBILITIES.

OUR FOCUS TODAY

- WE WANT TO SHARE OUR EXPERIENCES ON HOW TO HANDLE YOUR CHALLENGES- OUR CORE EXPERTISE
- SHOW YOU AN APPROACH ON HOW TO GET THERE
- A STEP BY STEP PROCESS AND ROAD MAP
- A METHODOLOGY ON HOW TO DETERMINE PROCESSES, APPROPRIATE TECHNOLOGY, AUTOMATION, SYSTEMS, ETC.
- IMPORTANCE OF SCALABILITY, MODULARITY AND FLEXIBILITY
- OUR EXPERIENCE SAYS “ONE SIZE DOESN’T FIT ALL”
- IMPORTANCE OF “JUSTIFIABLE AUTOMATION”
- AT THE END OF OUR PRESENTATION, WE HOPE THAT YOU WILL BE BETTER PREPARED TO FACE YOUR CHALLENGES

What are your objectives for 2020 and Beyond?

From our experience, the **ROAD MAP** follows the path below:

1. MISSION
2. KNOW
3. UNDERSTAND
4. DESIGN-
 1. DEVELOP
 2. ENABLE
5. IMPLEMENT
6. SUSTAIN



1. MISSION

**What are the obstructions in the path to your business's success?
What keeps you awake at night?**

WHERE TO START?
WHICH DIRECTION?
WHAT IS THE MISSION?

- **LABOR MARKET CHALLENGES**
- **AGING INFRASTRUCTURE/SYSTEMS**
- **CAPACITY LIMITATIONS**
- **SUPPORTING GROWTH**
- **KEEPING AHEAD OF YOUR COMPETITION**



1. MISSION

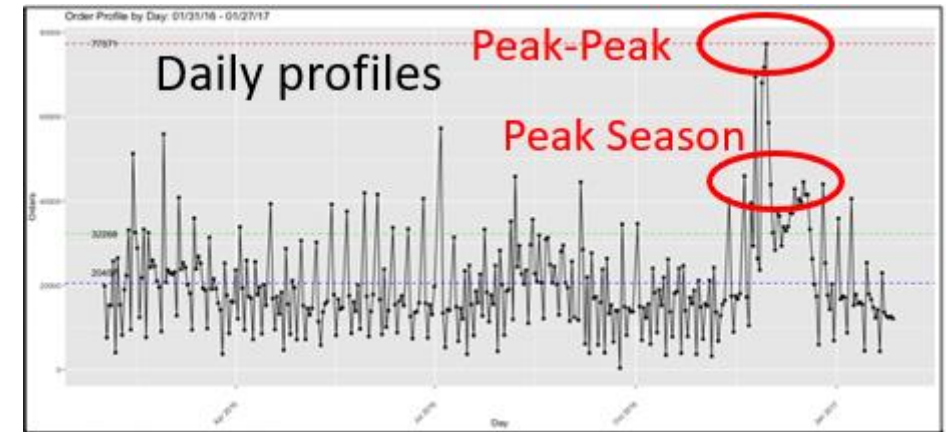
Who are your stakeholders and what are their priorities?

- MARKETING
- FINANCE
- SALES
- CUSTOMER



What are the current solutions being discussed and evaluated?

- UPGRADES TO PROCESSES / TECHNOLOGIES / SYSTEMS / AUTOMATION
- NEW FACILITY BUILDOUT
- THIRD PARTY SOLUTIONS / CONSULTING



2. KNOW Your Business

Are you aligned with the core requirements of your business?

- **GROWTH PLAN**
 - 5-10 Year **Volume** Growth Profile
 - 5-10 Year **SKU** Growth Profile
- **CUSTOMER SERVICE EXPECTATIONS**
 - Order to Ship Cycle Time
 - Delivery Expectations – Same Day/Next Day ; Daily/Bi-weekly Sales Replenishments
 - Customer Feedback Tracking

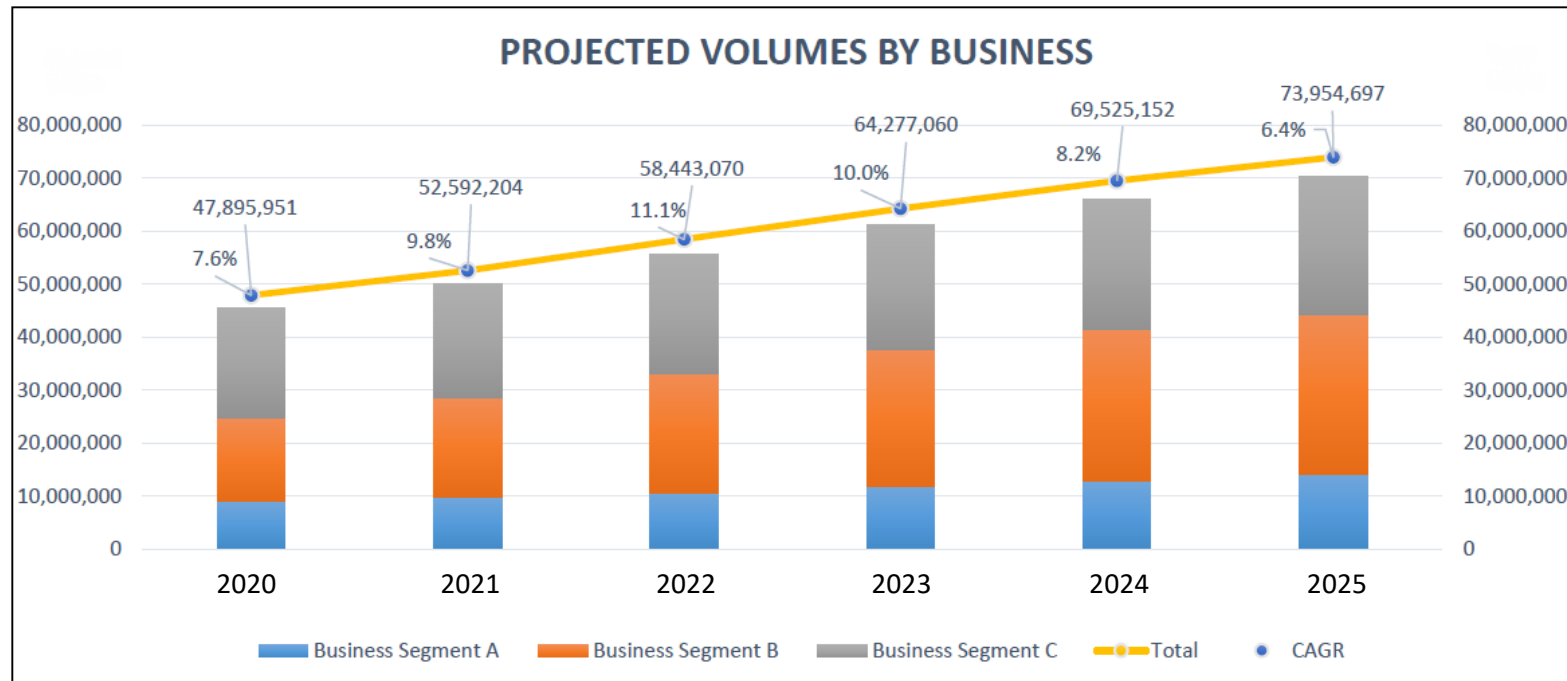
How do you compare with your market competitors?

How do you stack up to industry standards?

2. KNOW Your Business

Are you aligned with your Growth Plan for your business and able to support?

- 5-10 Year Growth Plan



2. KNOW: What Should We Learn?

- GAIN VISIBILITY OF GAPS
- FOCUS ON RIGHT PRIORITIES
- ESTABLISH BUSINESS DRIVERS
- EFFECTIVELY COMMUNICATE



Tells you where you are and where you need to go!

3. UNDERSTAND

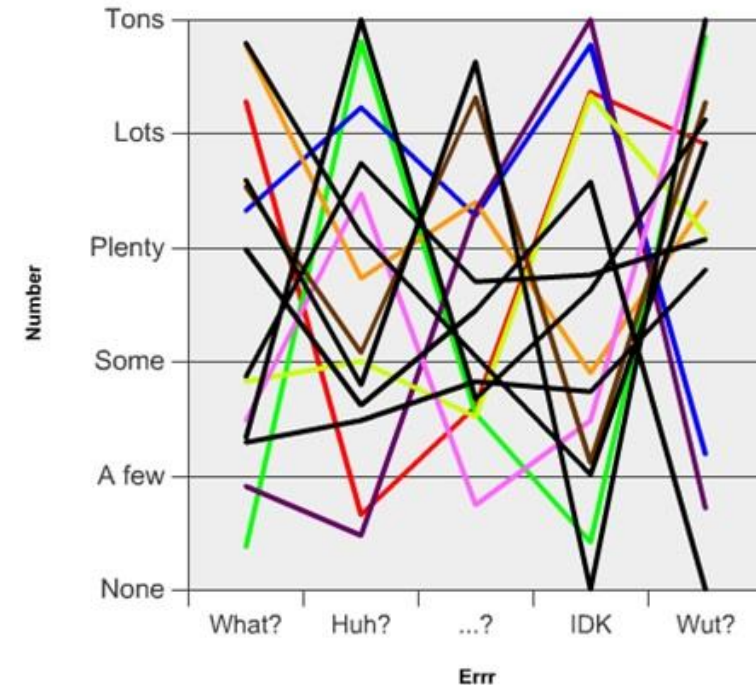
What is the DNA of your distribution operation?

Do you know what is driving your current performance within your four walls?

- RECEIVING
- STORAGE
- ORDER PICKING
- PACKAGING
- SHIPPING

Determine the “Design Criteria” needed to build your solution

Increase in Confusing Graphs

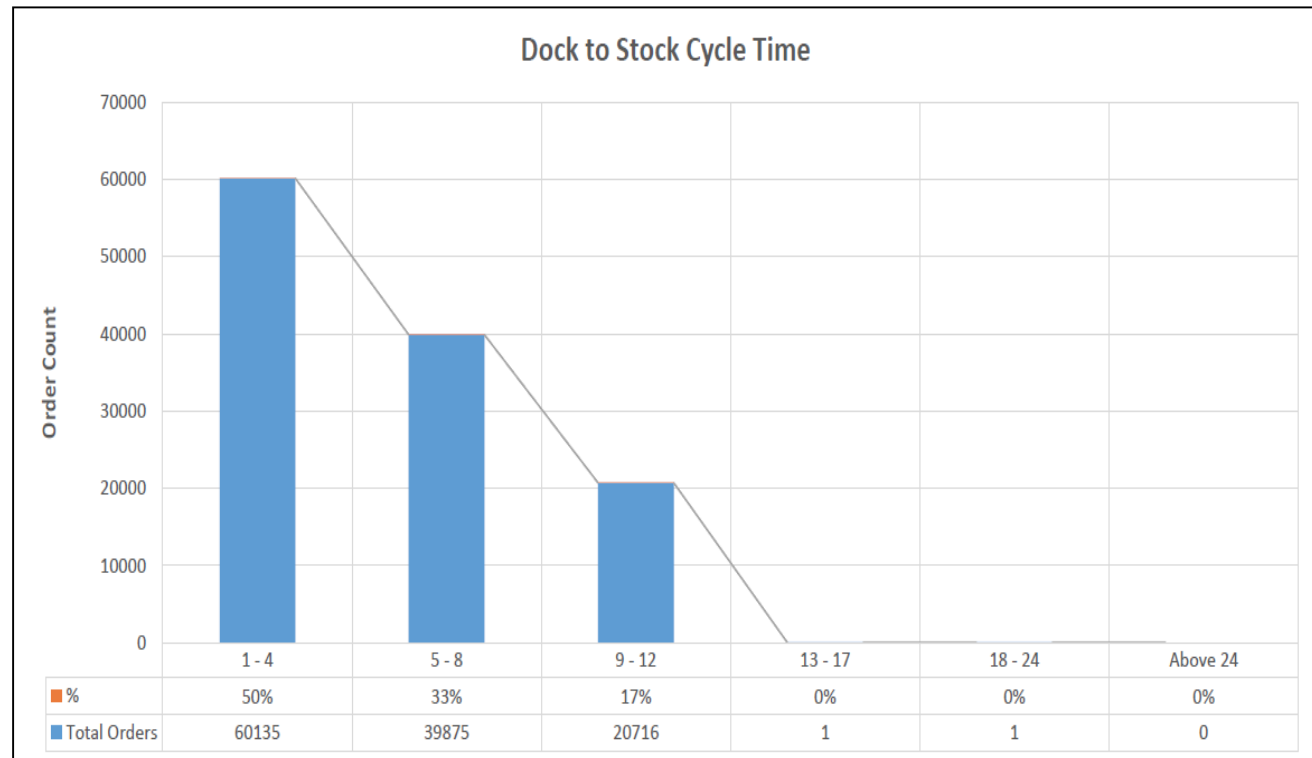


3. UNDERSTAND: Receiving

What is the importance of fast and accurate Receiving?

- RECEIVING

- Receiving Profile
- Dock to Stock
- Vendor Performance
- Exception Handling

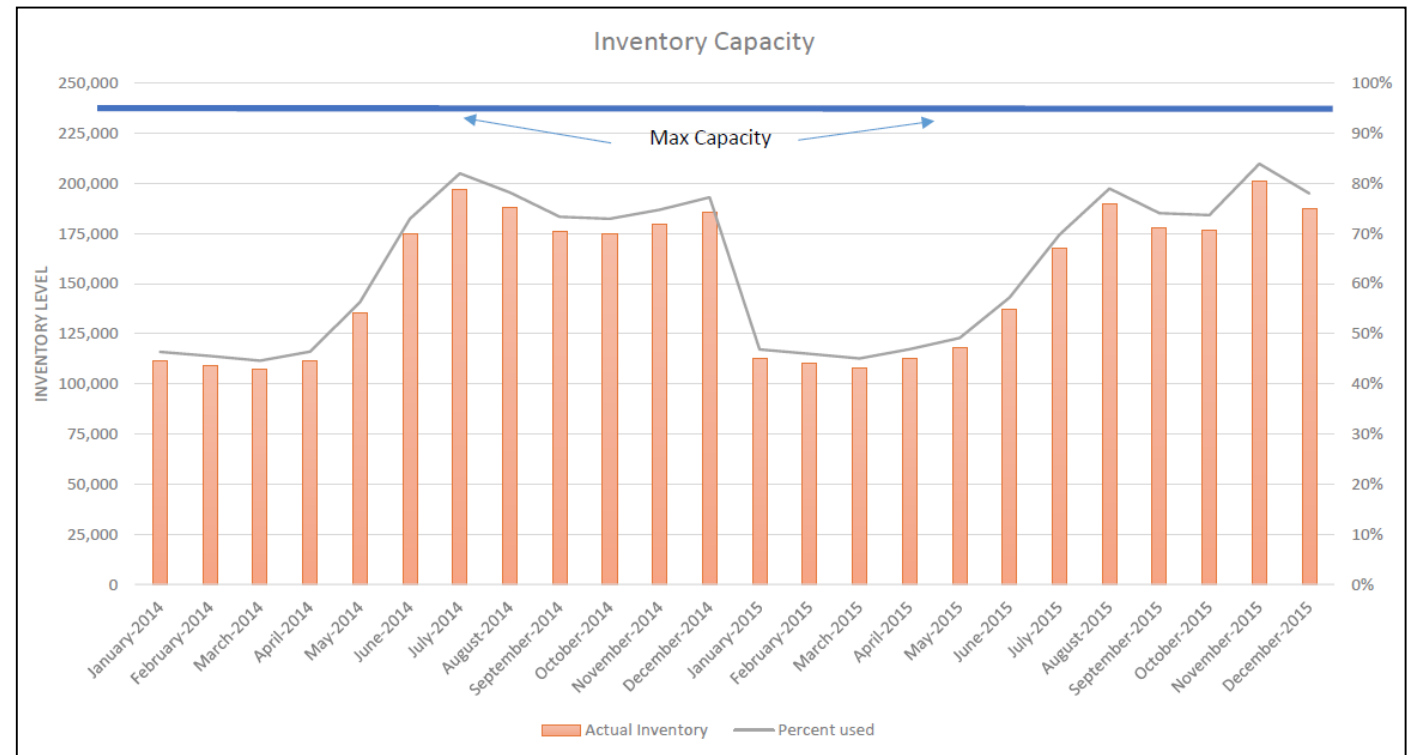


3. UNDERSTAND: Storage

What is the DNA of your Business? Do you know what is driving your results?

- **STORAGE**

- **Inventory Snapshot Profile**
- **Space Utilization**



3. UNDERSTAND: Fulfillment

What is the DNA of your Business? Do you know what is driving your results?

- FULFILLMENT
 - Order Profile
 - **SKU Velocity Profile**
 - **Order Profile Distribution**
 - Pick Short Rate
 - Pick Type Analysis (including labor and rate per type)

3. UNDERSTAND: Fulfillment

Do you have a plan to leverage the potential efficiencies from your product velocities?

SKU VELOCITY PROFILE (12 months data)

Cumulative				Total %	SKU %
Cumulative Range Of SKU's	Cumulative Units	Cumulative %	Avg. Units per Day		
1 - 10	3,666,702	9.35%	14,550	15%	<1%
1 - 20	5,818,257	14.83%	23,088		
1 - 30	7,446,357	18.98%	29,549		
1 - 100	14,121,648	36.00%	56,038		
1 - 500	28,396,579	72.39%	112,685	74%	22%
1 - 1000	34,929,897	89.05%	138,611		
1 - 1500	37,408,555	95.36%	148,447		
1 - 2000	38,308,639	97.66%	152,018		
1 - 3000	39,012,689	99.45%	154,812	9%	22%
1 - 4000	39,202,400	99.94%	155,565		
1 - 4491	39,226,827	100.00%	155,662		

Product types can drive automation, segregated inventory, additional fire safety requirements, additional shipping requirements, etc.

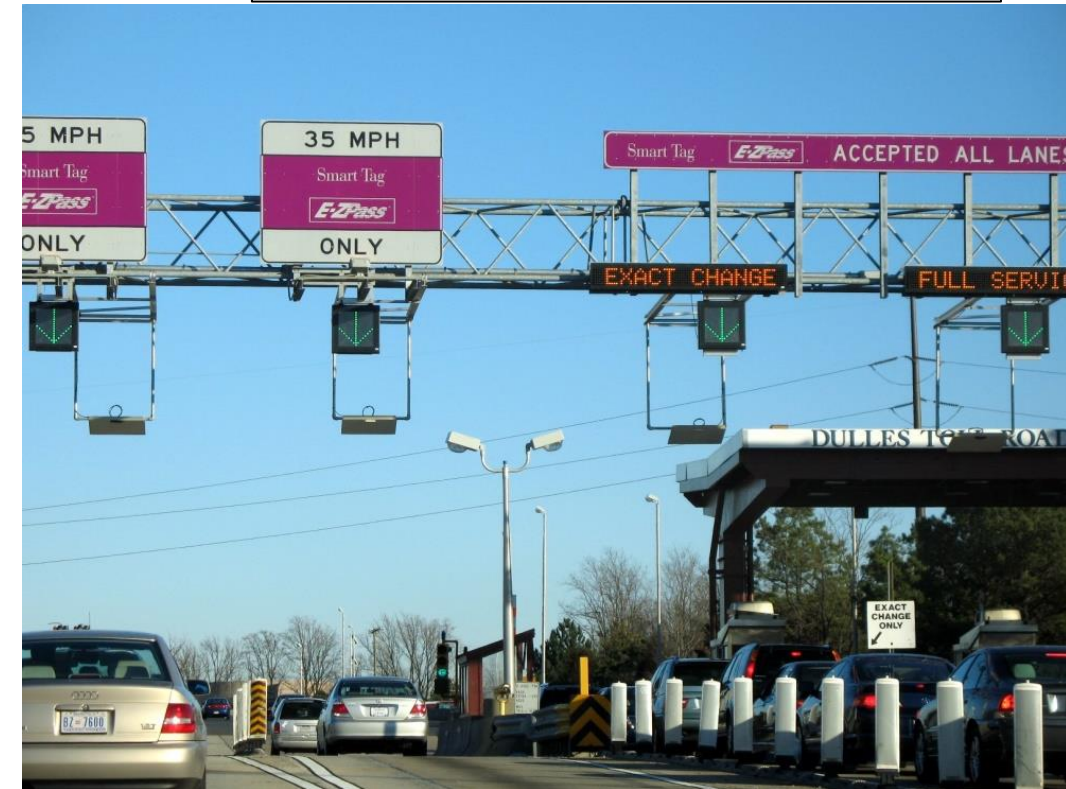
3. UNDERSTAND: Fulfillment

Does your current process have sufficient capacity for future growth?

Order Profile Distribution:

Analysis showing order line distribution—
Use for capacity levers

Single Unit	Orders	Lines	Units	Orders	Lines	Units
Shoes	3,971,900	3,971,900	3,971,900	57%	33%	28%
Apparel	684,467	684,467	684,467	10%	6%	5%
Hard Goods	143,839	143,839	143,839	2%	1%	1%
Sub-Total	4,800,206	4,800,206	4,800,206	68%	40%	33%
Multi Unit	Orders	Lines	Units	Orders	Lines	Units
Shoes Only	701,766	1,710,562	1,922,094	10%	14%	13%
Apparel Only	831,334	3,010,349	4,472,690	12%	25%	31%
Hard Goods Only	43,952	92,950	241,117	1%	1%	2%
Combo (Apparel/Shoes)	480,690	1,805,511	1,932,042	7%	15%	13%
Combo (Hard Goods + anything)	158,889	705,701	998,556	2%	6%	7%
Sub-Total	2,216,631	7,325,073	9,566,499	32%	60%	67%
Total	Orders	Lines	Units	Orders	Lines	Units
Shoes Only	4,673,666	5,682,462	5,893,994	67%	47%	41%
Apparel Only	1,515,801	3,694,816	5,157,157	22%	30%	36%
Hard Goods Only	187,791	236,789	384,956	3%	2%	3%
Combo (Apparel/Shoes)	480,690	1,805,511	1,932,042	7%	15%	13%
Combo (Hard Goods + anything)	158,889	705,701	998,556	2%	6%	7%
Total	7,016,837	12,125,279	14,366,705	100%	100%	100%



These distributions can guide you to developing different process channels that align best with your business.

POWERED BY POSSIBILITIES.

3. UNDERSTAND: What Should We Learn?

Functional Operational Areas:

- RECEIVING
- STORAGE
- ORDER PICKING
- PACKAGING
- SHIPPING

Baseline Data Gathered:

- Current Capacity Baseline + Growth
- Product Velocities
- Baseline Costs and Productivities
- Order Profiles and Distributions
- Gaps to Market and Industry

We've armed ourselves with the information we need to improve or build our processes.

4. DESIGN Your Processes

What are the steps needed to build efficient processes?

- **DEVELOP YOUR FOUNDATION**
- **ENABLE YOUR PROCESSES**
 - **TECHNOLOGY**
 - **AUTOMATION**
 - **SYSTEMS**

4.1 DEVELOP Your Foundation

Your operation is only as strong as your foundation. These are the principles to build your processes that the rest of your business can rely on.

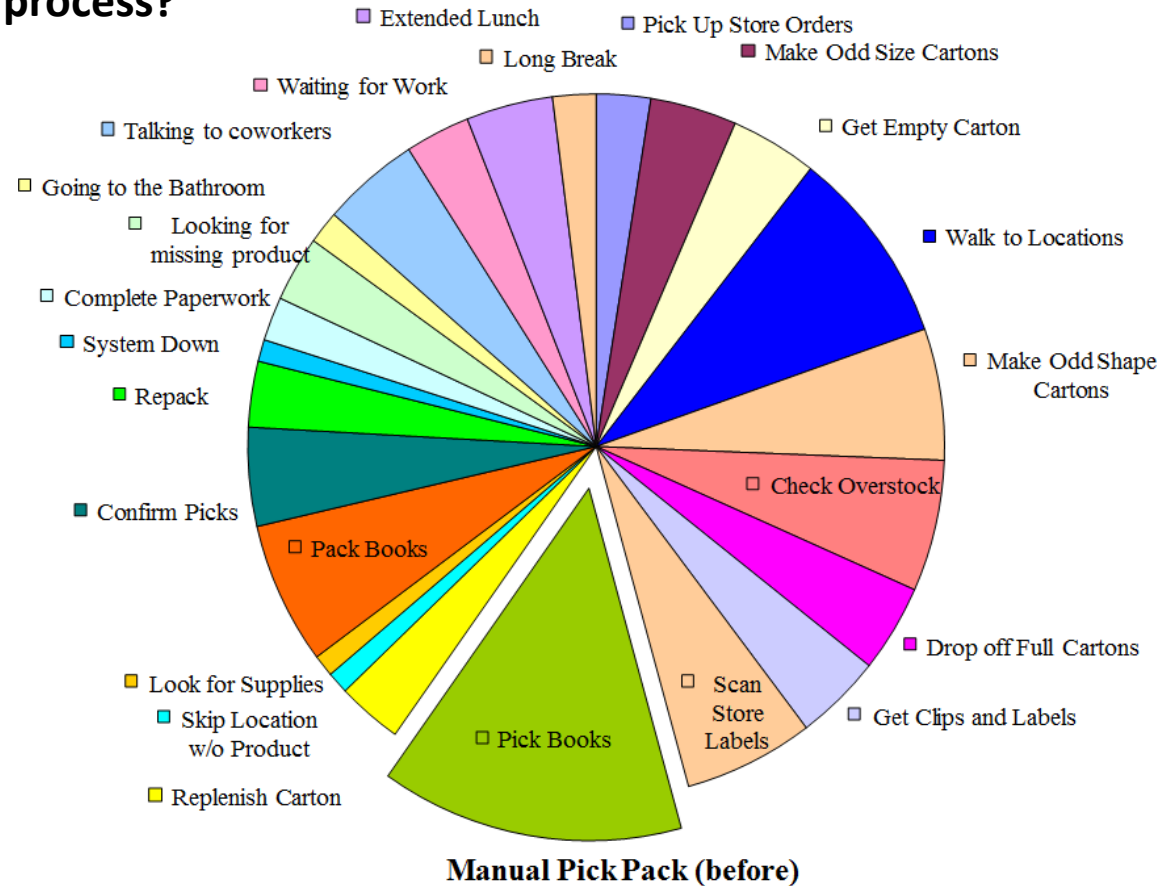
- **CORE ELEMENT**
- **PROCESS FLOW: IN-LINE, ON-LINE**
- **ASSEMBLY LINE: BALANCED AND BUFFERED**
- **STATION BASED – SYSTEM PACED**
- **MODULAR / SCALABLE / FLEXIBLE**
- **TIME MANAGEMENT (:02 Principle)**
- **MINIMIZE TOUCHES**
- **24-7 ENABLED OPERATIONS**
- **PROFICIENCY VS. EFFICIENCY**

4.1 DEVELOP: Core Element

What is the core element of your process?

Understand all the minutia an employee deals with each day

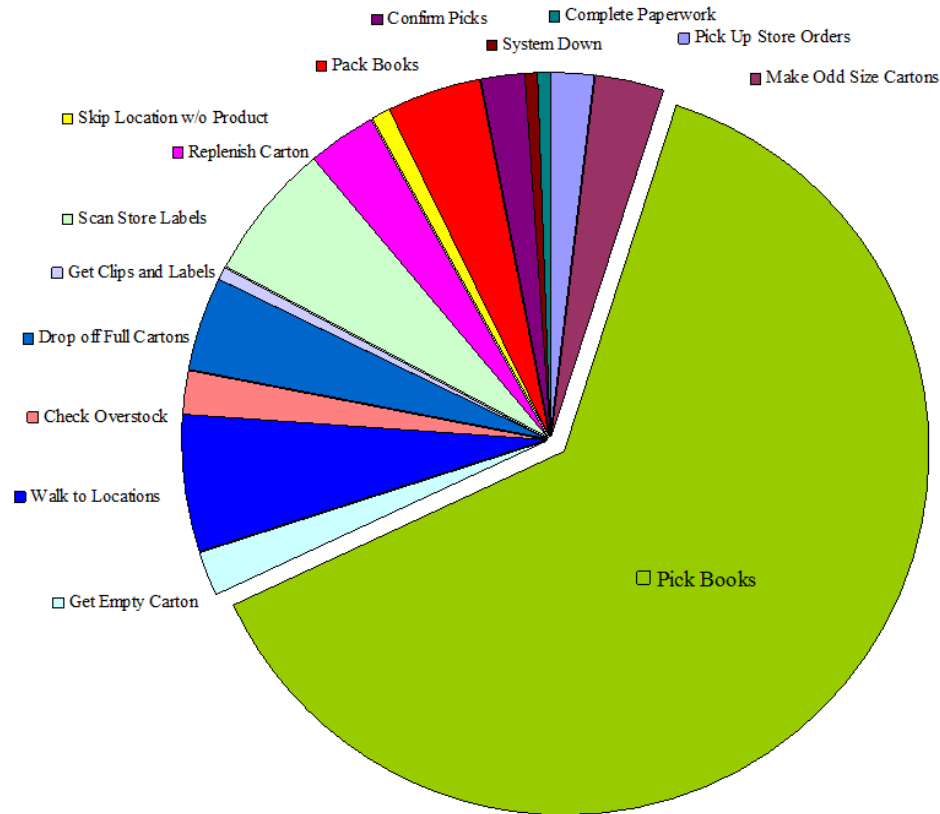
Example of actual time study performed



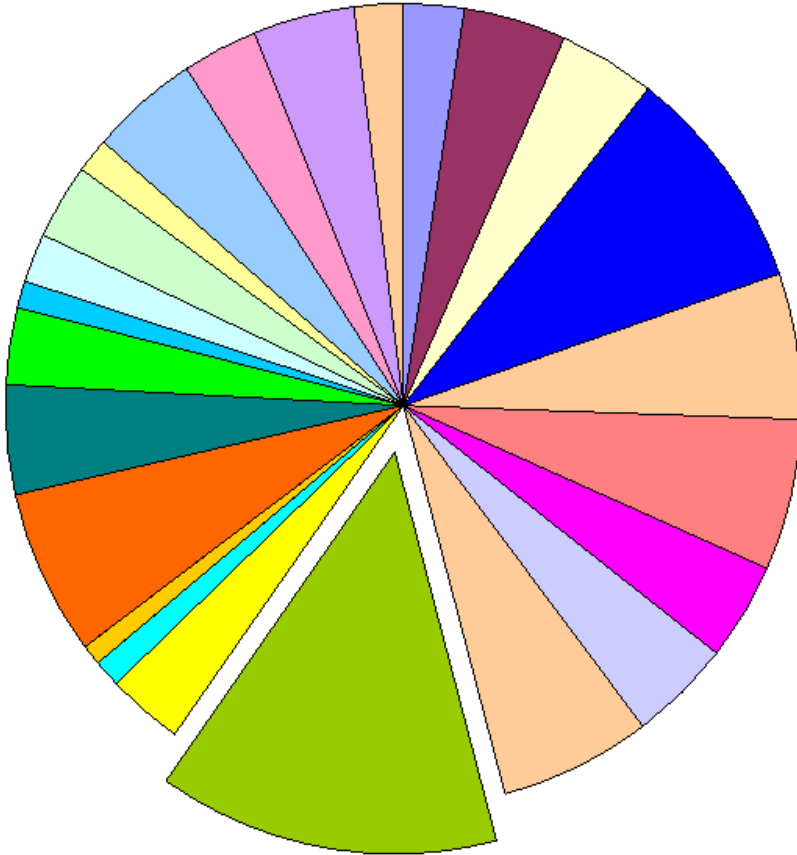
4.1 DEVELOP: Core Element Analysis

How much capacity can be gained if optimized?

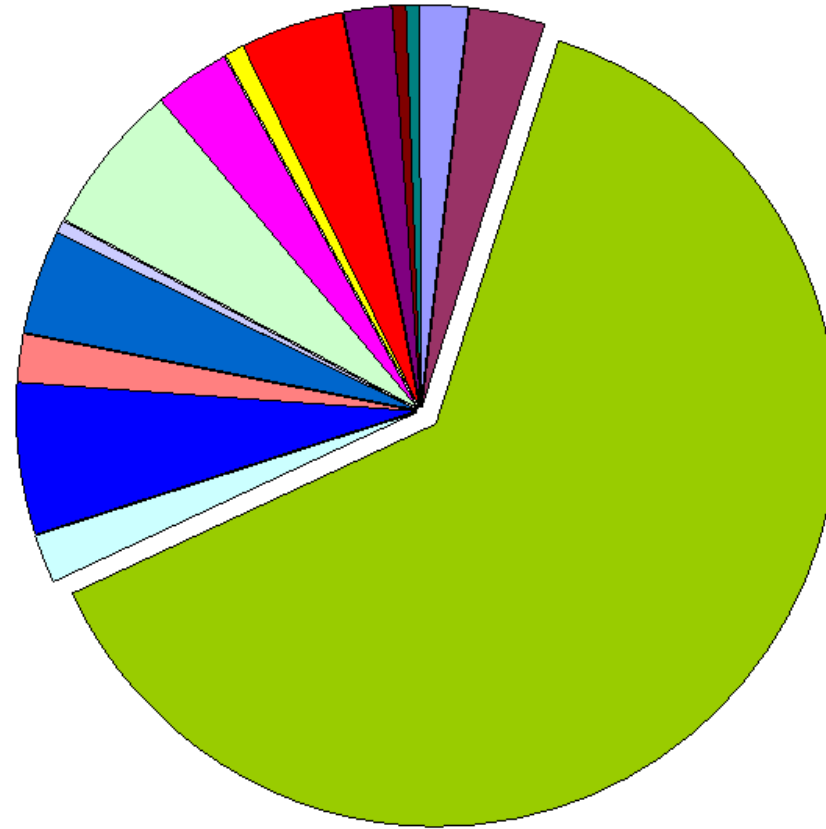
Graph shows a simplified process focusing the employee on maximizing the core element of their job.



4.1 DEVELOP: Core Element Analysis



Manual Pick Pack (Before)



Manual Pick Pack (After)

4.1 DEVELOP: Station Based – System Paced

How do you make your workstations efficient and maximize worker productive time?



Minimizing travel will minimize distractions and utilizing systemic tasks that drive productivity will simplify training and create a rhythm for the employee.

4.1 DEVELOP: Station Based – System Paced

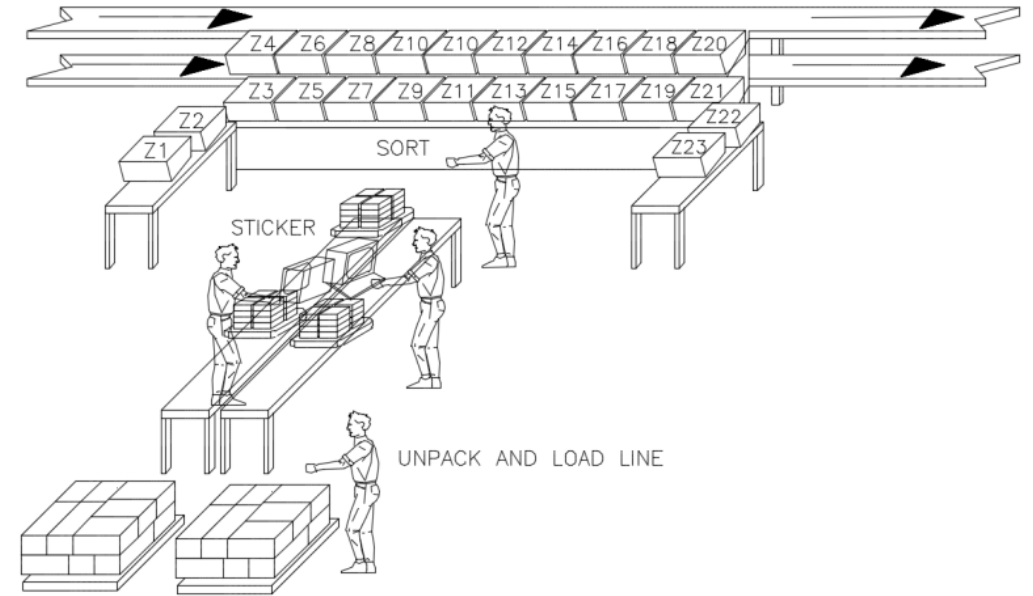
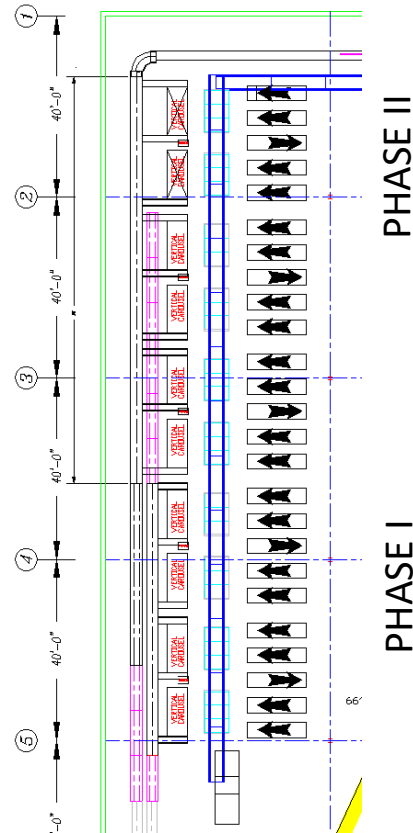
How do you make your workstations efficient and maximize worker productive time?



4.1 DEVELOP: Modular / Scalable / Flexible

How do you design processes that can adapt to a disruptive and ever-changing environment?

- MODULAR
- SCALABLE
- FLEXIBLE



4.2 ENABLE Your Processes

How do you align your infrastructure to enable your process?

- TECHNOLOGY
- AUTOMATION
- SYSTEMS

4.2 ENABLE- Automation

What level of automation fits?

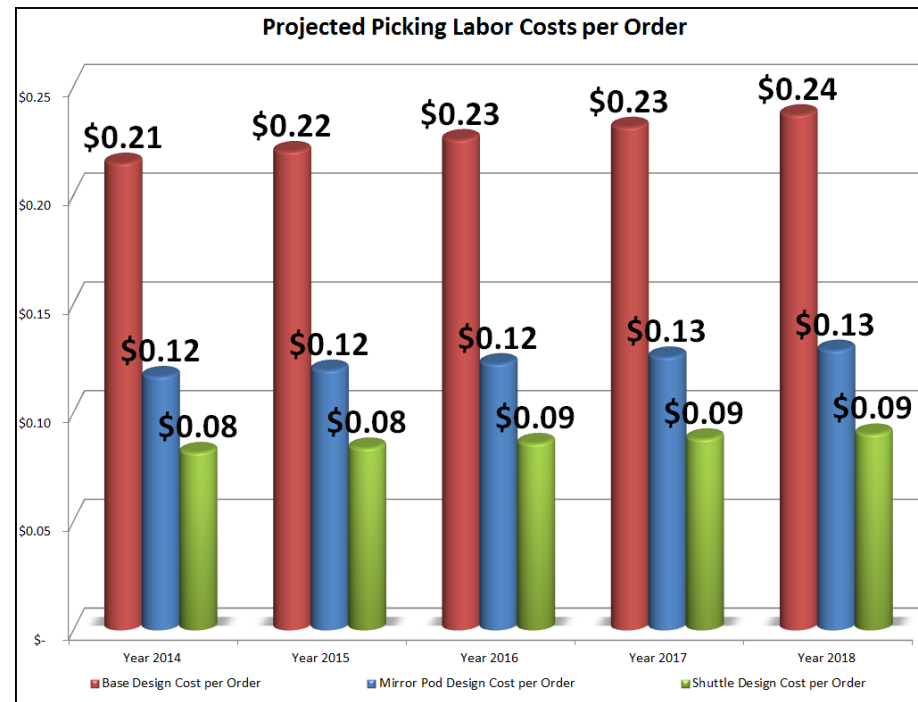
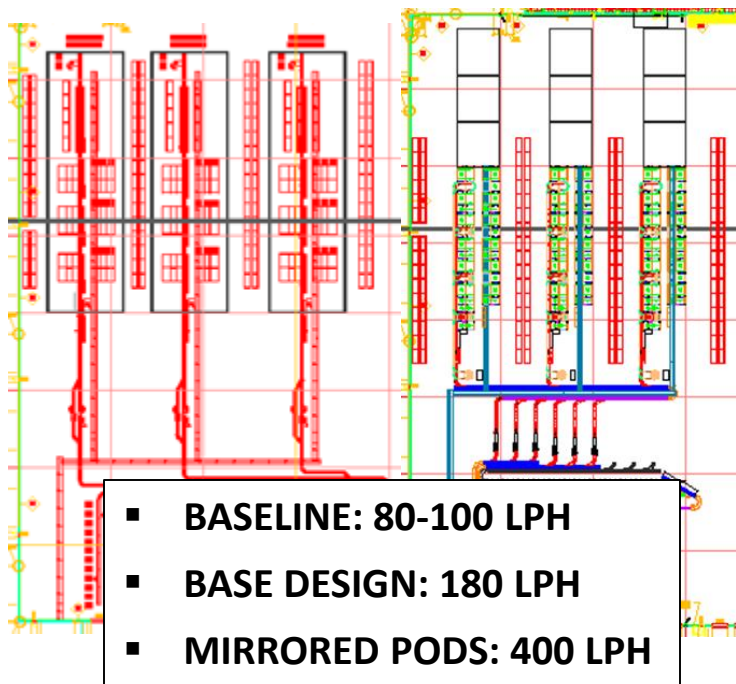
Guideline for Determining Appropriate Automation

SKU Velocity				ORDER LINES PER HOUR											
A	B	C	D	0	100	200	300	400	500	600	700	800	900	1000	COST
X	X	X								AUTOMATION- SORTATION, SHUTTLE, ETC					HIGH
X	X	X	X				VERTICAL / HORIZONTAL CAROUSELS								MED-HIGH
X	X	X				PICK TO LIGHT									MED-HIGH
X	X	X			VOICE PICKING										LOW-MED
X	X	X			VISUAL PICKING										LOW-MED
		X	X	RF PICKING											LOW-MED
		X	X	PAPER PICKING											LOW
TYPICAL MHE				RACKING - CARTS/PJs			PICK MODULE / CONV			AUTOMATED SYSTEMS					

These graphs give you a flavor of possible alternatives to evaluate.

4.2 ENABLE- Automation

Example of applying appropriate Automation to business requirements –



Payback for the 1st alternative was 7 mos vs. 4.5 yrs for the 2nd alternative
Speed of implementation was also a factor – 4 mos vs 12

4.2 ENABLE- Automation

Example of applying appropriate Automation to business requirements –

LARGE SKU BASE- 55K

- RF pick and pass
- Voice
- Pick to Light

PRODUCTIVITIES

- BASELINE: 120 LPH
- ACTUAL: 200-225 LPH



4.2 ENABLE- Systems

Are your current systems an enabler to your process development or a constraint?

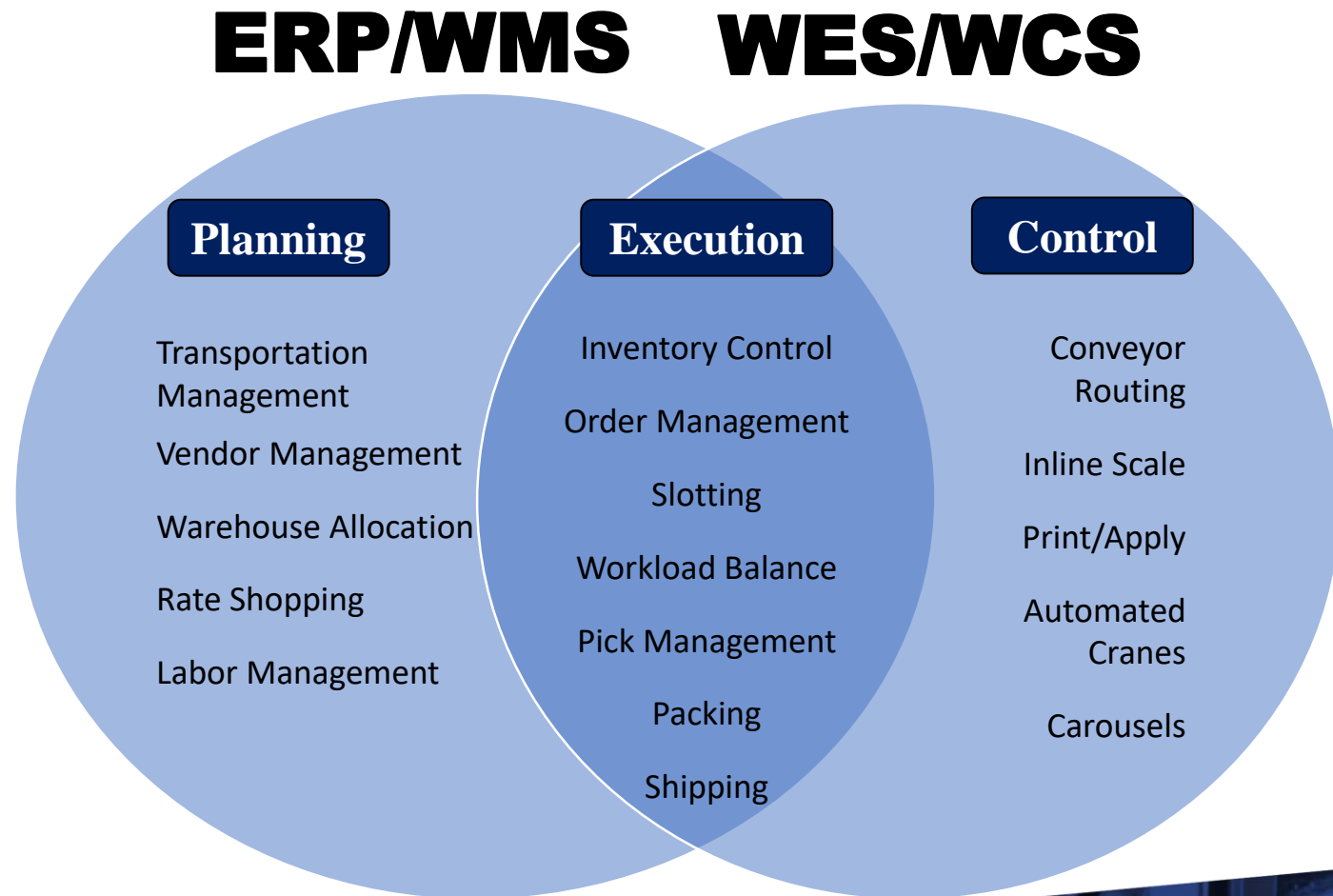
- **Typical Issues found with legacy systems**
 - **FLEXIBILITY**
 - **COST**
 - **LEAD TIME TO IMPLEMENT CHANGES**
 - **SUPPORT-**
 - **EXTERNAL**
 - **INTERNAL RESOURCES**

An answer to many of these issues can be found in a WES/WCS solution.

4.2 ENABLE – Systems

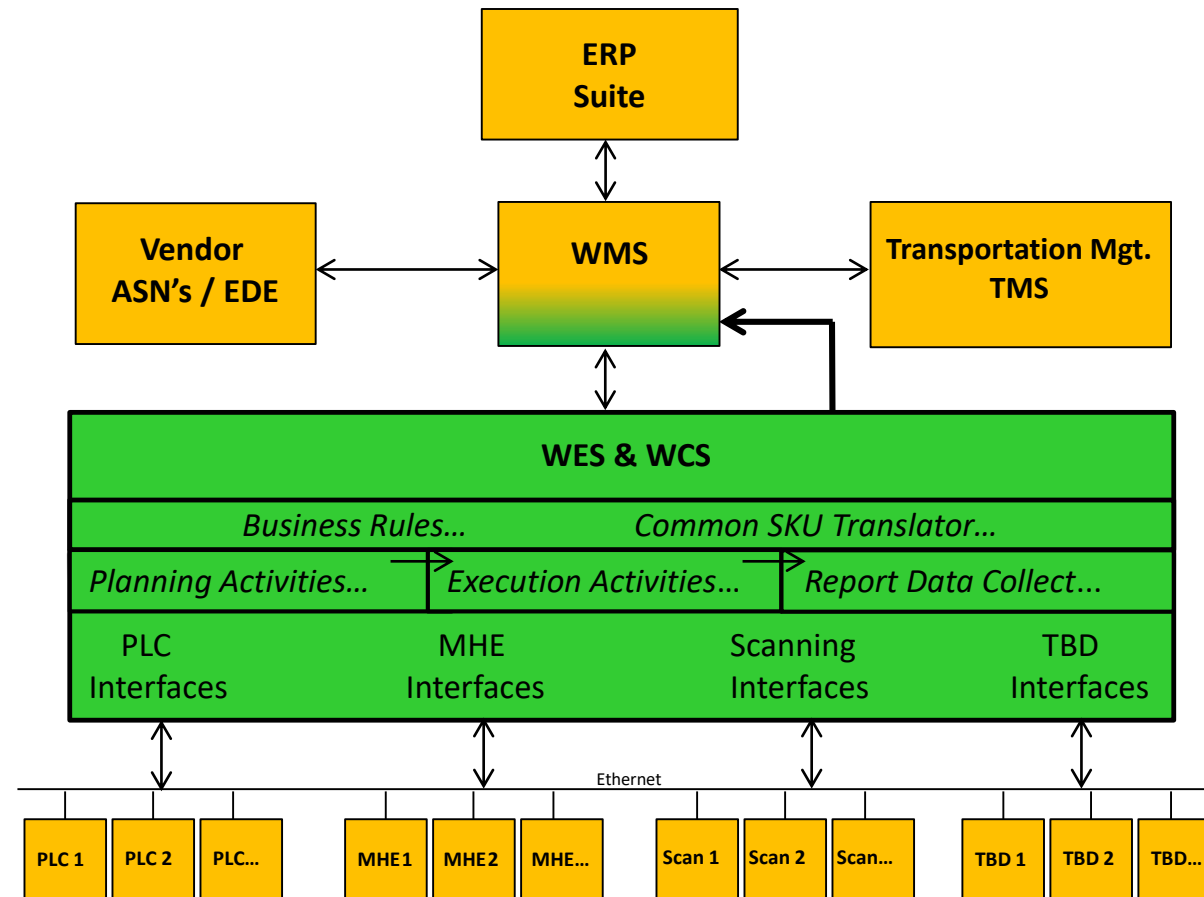
What is a WES / WCS?

- Warehouse Execution System
- Warehouse Control System



4.2 ENABLE – Systems

Possible
System
Architectural
Hierarchy:



4.2 ENABLE – Systems

Why do you need a WES / WCS?

- The WES / WCS is the **Senior Resource Scheduler & Coordinator** of the Distribution Floor Activities. It ensures efficient load balancing throughout the DC.
- Implementing a Full Featured WES / WCS **reduces and in some cases eliminates the need for more costly ERP / WMS customizations.**
 - ERP / WMS customizations are costly and take longer to implement...
 - ERP / WMS customizations complicate the process of release upgrades...
 - ERP / WMS customizations impact more people and are riskier...
- **WES / WCS systems** are typically designed around a **Narrower** and more **Specific** set of **industrial features and functions** than ERP & WMS Systems which are typically focused on a much Broader and more Universal set of industrial features & functions.
- *Thus the WES / WCS layer is a **BRIDGE** that **spans the functionality gap** between key systems AND **allows for a more agile and cost-effective evolution** of these systems WHILE **preserving your WMS & ERP investments for longer durations!***

4.2 ENABLE – Systems

How do you decide which WES / WCS is best?

- Does the WES / WCS vendor **UNDERSTAND** your business DNA?
- Does the WES / WCS vendor have significant **INDUSTRY EXPERIENCE**?
- Does the WES / WCS vendor have the **STAFF EXPERIENCE** and depth of staff to design, install, commission & support you for the long term?
- What is the **PROCESS** the WES / WCS vendor uses to **DEFINE** the project?
 - The disciplined use of a **Functional Design Specification process is a MUST...**
 - The periodic use of **Conference Room Pilots is a MUST...**
- Can the WES / WCS vendor **EXPLAIN & DEMONSTRATE** that their systems are constructed in a **MODULAR & SCALABLE** fashion...?
 - *This requires a good deal of Q & A around HOW they will handle your specific needs now and in the future; HOW LONG IT WILL TAKE and HOW MUCH IT WILL COST for them to meet these needs. The longer & more expensive it is may indicate a **LESS MODULAR & SCALABLE** system...*

4.2 ENABLE – Systems

WES / WCS Implementation Best Practices:

- Successful Implementations: **ASSIGN & DEPLOY** – *Cross Functional Project Teams*
 - Sales, Operations, Finance, Maintenance, Technical...
- Successful Implementations: **COMMIT** – *Executive Sponsorship*
 - The Project Team & Vendor must **FEEL** the presence of the Executive Sponsors
- Successful Implementations: **UNLEASH** – *Project Champions*
 - *The Project Champions need to TRUST that they are supported 100%*
- Successful Implementations: **DEFINE** – *Clear Performance Metric Objectives*
 - *Metrics must be established and measured hourly, per shift, daily, weekly...*
 - *Your WES / WCS should automatically measure and report on these metrics...*
- Successful Implementations: **REQUIRE & COMMIT** to Continuous Training Programs
 - Workforce training significantly **improves the performance of the system & ROI**
- Successful Implementations: **ESTABLISH SECURE SYSTEMS...**
 - No longer a “nice to have” - It is a **REQUIREMENT FOR ALL WES / WCS Systems**

4.2 ENABLE – Systems

WES / WCS Final Thoughts:

- Defining and implementing a SUCCESSFUL WES / WCS solution:
 - This is an **ENGINEERED PROCESS** – no different than any Engineering Project
 - It is **NOT** – *Have it designed and built and then pick up the keys at the end!*
 - *Your vendor should help you define the “Fit, Form & Function” of the WES / WCS*
- *“The gap between the BEST software engineering practice and the AVERAGE practice is VERY WIDE. Perhaps wider than in any other engineering discipline”* Quote by Fred Brooks - Notable Computer Scientist...
- All software projects are about RISK and RISK mitigation:
 - *One good way to mitigate risk is to establish CLEARLY DEFINED REQUIREMENTS that are MEASUREABLE...*
- You likely **won’t see** any WES / WCS Vendor’s sponsoring Super Bowl Commercials:
 - This is because these vendors are typically smaller and have a more focused market. However – these systems are **EQUALLY IMPORTANT** to your business as the upper tier more well-known ERP and WMS Systems are.

4. DESIGN: What Should We Learn?

How do we get where we want to go?:

- ESTABLISH CORE PRINCIPLES OF PROCESSES
- LEVERAGE TECHNOLOGY TO DRIVE IMPROVEMENTS
- APPLY APPROPRIATE LEVELS OF AUTOMATION TO PROCESSES
- IMPLEMENT FLEXIBLE SYSTEMS THAT CAN ADAPT TO A DISRUPTIVE BUSINESS ENVIRONMENT
- BUILD PROCESSES THAT FIT YOUR REQUIREMENTS FOR A COMPETITIVE ADVANTAGE IN YOUR INDUSTRY

Processes are not one size fits all. They should be as custom fit to your business demands with the ability to adapt and expand quickly in today's environment.

5. IMPLEMENTATION

Where do you start once you have determined the right solution?

- Many great designs have failed due to poor execution
 - Capital Investment Plan- Phased to spread
 - Project Scheduling - Created by Professionals and validated by Professionals
 - Typically one of the most overlooked constraints- PERMITTING
 - Project Team- Built with Top Level Sponsors that drive results
 - Communication- Effective and timely with only valuable details
 - Insurance?

6. SUSTAIN – CULTURE OF CHANGE

Once you are on a path towards your goal, how do you keep from getting sidetracked?

- Once your processes are fundamentally solid, how do you optimize?
Are there tools that can help ensure that we continue to improve?
 - LEAN METHODOLOGIES
 - SIX SIGMA
 - LABOR STANDARDS / INCENTIVES
 - CUSTOMER SERVICE

To create a culture of change, there has to be a commitment **from the leaders to the floor.**

6. SUSTAIN – Continuous Improvement

How do you maintain control of changes made ?

- Do you have the right infrastructure in place?
 - TRAINING
 - SUPPORT
 - CULTURE DRIVERS
 - MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS, CONSORTIUMS, ETC.

To create a culture of change, there has to be a commitment from the **floor to the leaders – feedback loops are critical**

3. FIND YOUR SOLUTION

Follow the Roadmap for the Steps toward SUCCESS!

1. **MISSION**
2. **KNOW** your business
3. **UNDERSTAND** your data
4. **DESIGN-**
 1. **DEVELOP** your processes- Leverage Guiding Principles
 2. **ENABLE** appropriate Automation, Systems and Technology, to enable your processes
5. **IMPLEMENTATION** map areas of opportunity and execute
6. **SUSTAIN** a culture of change

CLOSING

What have we learned?

- DO I UNDERSTAND MY BUSINESS?
- ARE MY OPERATIONS OPTIMIZED?
- AM I LOOKING TO APPLY THE RIGHT SOLUTIONS TO THE RIGHT PROBLEMS?

The question everyone must answer...

ARE YOU AN **ENABLER** TO YOUR BUSINESS'S SUCCESS OR ARE YOU A **CONSTRAINT**?

Marketing, Finance and Sales, all want to be unfettered by constraints

NEVER COMPROMISE ON THE SERVICE YOU CAN PROVIDE TO YOUR CUSTOMERS

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