



## **Keynote – Gaining Competitive Advantage Through Lean Distribution**

The cutting edge in gaining distribution competitive advantage is lean. Many customers and suppliers are implementing lean procedures and are asking their distributors to do the same. The problem is that lean processes have not been well defined for distributors.

This session addresses how to implement lean in distribution organizations with practical methods, tools and techniques. This session will use case studies from real distributors to describe and demonstrate lean processes and their value.

**F. Barry Lawrence, Ph.D., Texas A&M University**

*3/12/2010, 8:00 a.m.*

## Session Objectives

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- Applying Lean Techniques in Distribution Industry
- 10-step Lean Implementation Framework
- How to focus more on Customer Value Add (CVA) activities
- Utilize Case Studies to Apply Principles
- Link to ROI

## Return on Investment Opportunity

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- In tough economic times like the current condition every component of the Income statement (Expenses) should be analyzed and optimized
- ROI Expectations has Increased Due to Perceived Higher Risk and Tightened Credit

## Additional Resources

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- “Optimizing Distributor Profitability” available from the NAW.
  - <http://www.naw.org/optimizdistprof>
- Educational Programs from the Thomas and Joan Read Center for Distribution Research and Education at
  - <http://readcenter.tamu.edu>
    - Pricing Optimization
    - Optimizing Distributor Profitability
    - Certificate in Distribution Management
    - Custom Programs
- Research from the Supply Chain Systems Laboratory
  - <http://supplychain.tamu.edu/>

## What do you see?

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**Glass is  
'Half Full'**

**Optimist**

**Glass is  
'Half Empty'**

**Pessimist**

**I have more  
space than  
what I need**

**Lean  
Specialist**

- **What is 'Lean'?**
- A program designed to:
  - Eliminate Waste
  - Reduce Resource Commitments
- It draws upon and is supported by other programs:
  - Six Sigma
  - TQM – Total Quality Management
  - TOC – Theory of Constraints

Lean is a systematic approach of **eliminating waste**

**Waste** is any activity that consumes resources but adds **NO VALUE!**

## Tenets of Lean

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- Waste Reduction → Muda
- Continuous Flow → Just in Time
- Customer Pull → Kanban
- Lower Cycle Times → Lead Time Reduction
- Increased Profits → Service Control
- Flexibility → Agility
- Zero Defects → Never Stock-out on Key Inventory
- Cont. Improvement → Measure & Improve
- Higher Worker Morale → Measuring, Training, to Ensure Success

**Minimize Variability Wherever Possible**



## Relevant Lean Tools



<b>KAIZEN TOOLS</b>	<b>QUALITY</b>	<b>SAFETY</b>	<b>PRODUCTIVITY</b>	<b>HOUSE KEEPING</b>
<b>Value Stream Map (VSM)</b>	X		X	
<b>5S / Visual Management</b>	X	X	X	X
<b>Layout design / redesign</b>	X	X	X	X
<b>5 Whys</b>	X		X	
<b>Cause and Effect</b>	X		X	
<b>7 wastes</b>	X	X	X	X

# Value Stream Mapping (VSM)

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- **What is VSM?**

- A material & information flow map that analyses the flow of material & information required to bring a product or service to a customer

- **Why should it be used?**

- Provides a good understanding of the overall process and highlights the areas with biggest improvement opportunities

- **How is it done?**

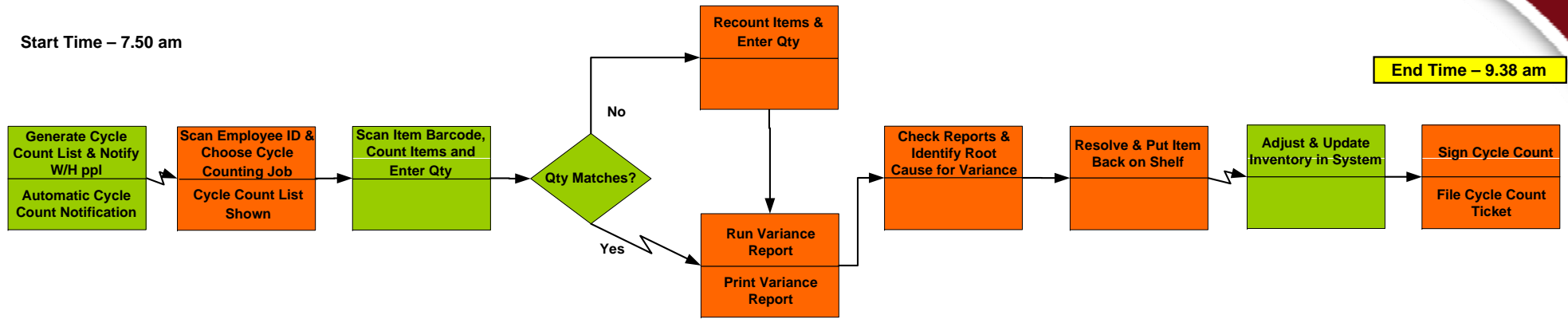
- Current State / As-Is VSM
  - Future State / To-Be VSM

- **Customer Value Add (CVA) Activities**
  - Activities that add value to customer's product/service
  - Customers are willing to pay for these activities
  - Strive for competitive advantage
  - What we **want to** do
- **Business Value Add (BVA) Activities**
  - Business required activities that do not add value to customer's product/service
  - Identify potential for automation to reduce activity time
  - What we **have** to do
- **Non Value Add (NVA) Activities**
  - Activities that generate "Waste"
  - Need to be eliminated
  - What we **do not want** to do

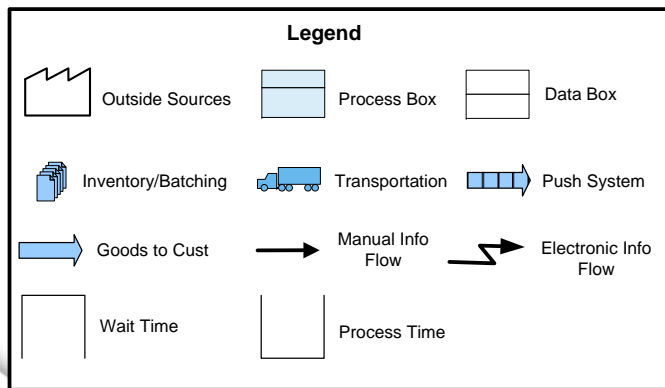
# Sample VSM – Cycle Counting

Start Time – 7.50 am

End Time – 9.38 am



P/T = 0 min Resp – Inv Ctrl	P/T = 10 sec Resp – W/H ppl	P/T = 60 min Resp – 4 W/H ppl	P/T = 10 sec Resp – W/H ppl	P/T = 5 min Resp – W/H ppl	P/T = 15 min/line Resp – Opr Mgr	P/T = 12 min Resp – W/H ppl	P/T = 1 min Resp – Inv Ctrl	P/T = 30 sec Resp – Br Mgr & W/H ppl
				P/T = 1 min Resp – W/H ppl				



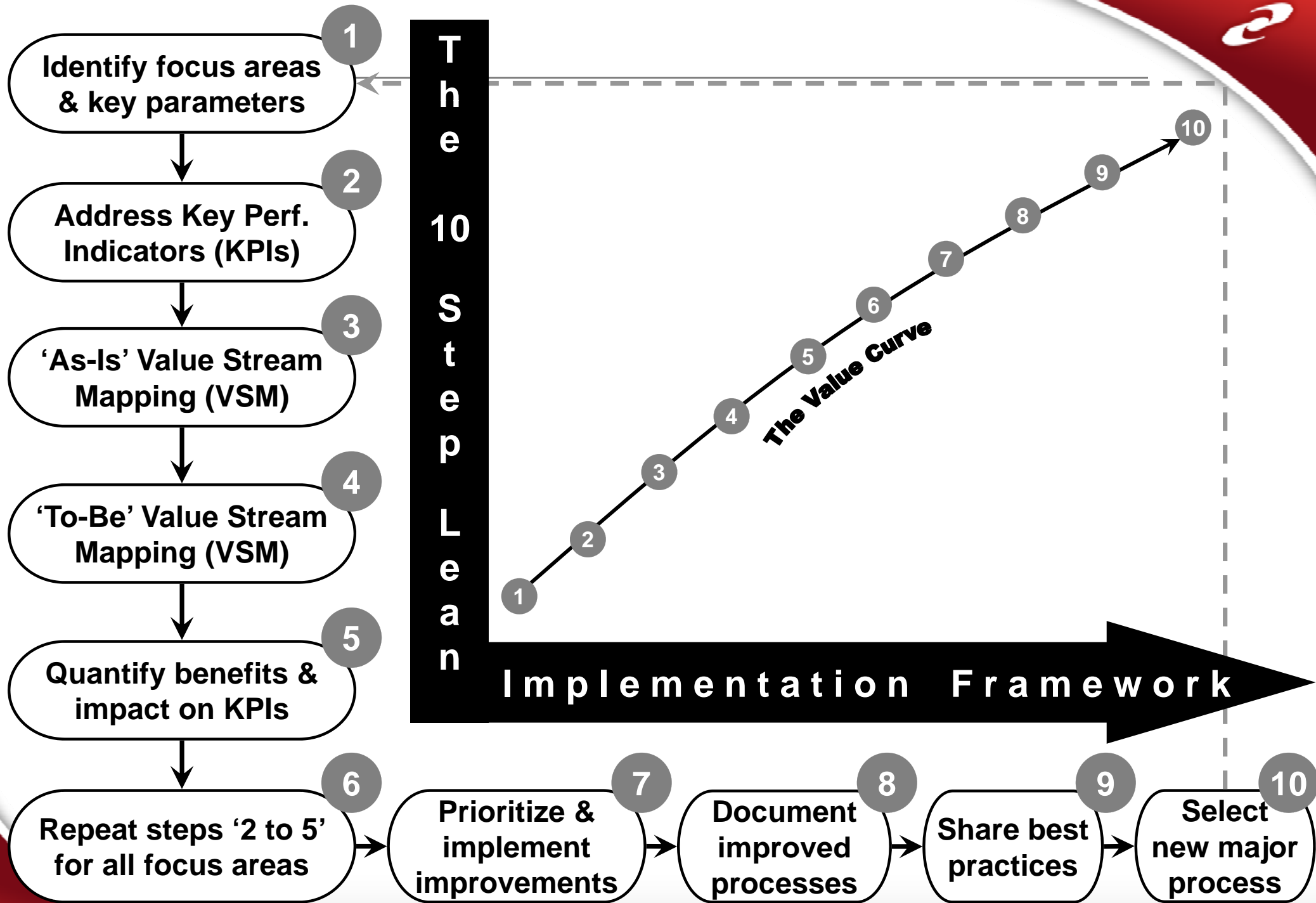
No of items on cycle count ticket	- 69
No of items recounted	- 15
No of items with variance	- 2
Process Time	- 94 min
Wait Time	- 14 min
No of people involved – 4 W/H ppl + Inv Ctrl + Opr Mgr	

<b>CVA</b>	=	$\frac{61}{108}$	=	<b>56.4 %</b>
<b>BVA</b>	=	$\frac{33}{108}$	=	<b>30.5 %</b>
<b>NVA</b>	=	$\frac{14}{108}$	=	<b>12.9 %</b>

## The 10-Step Lean Implementation Framework

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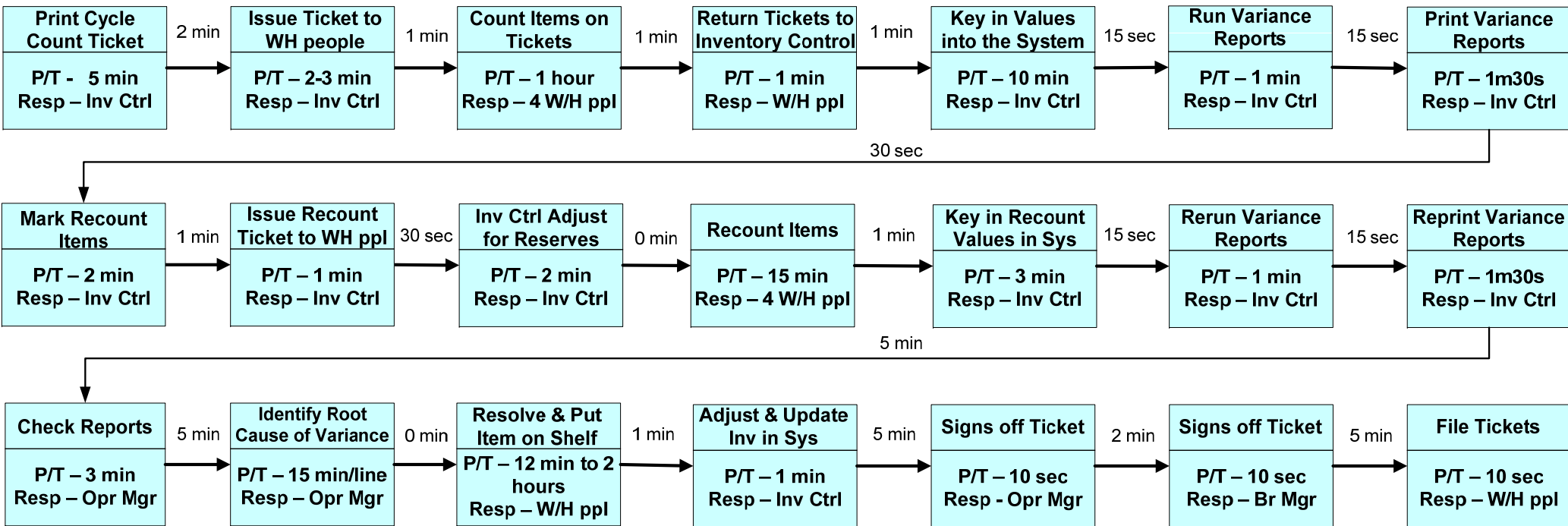
- A structured approach to lean initiatives
- Steps could be eliminated/added based on initiative
- Helps in maintaining consistency of lean initiatives across the organization
- **Key Points**
  - Incorporates lean tools – VSM, Process Flows, etc.
  - Addresses Key Performance Indicators (KPIs)
  - Helps prioritize improvement opportunities for implementation based on a Weighted factor decision model
  - Facilitates Best Practice identification and bench marking for other locations





## Cycle Counting

Start Time – 7.50 am



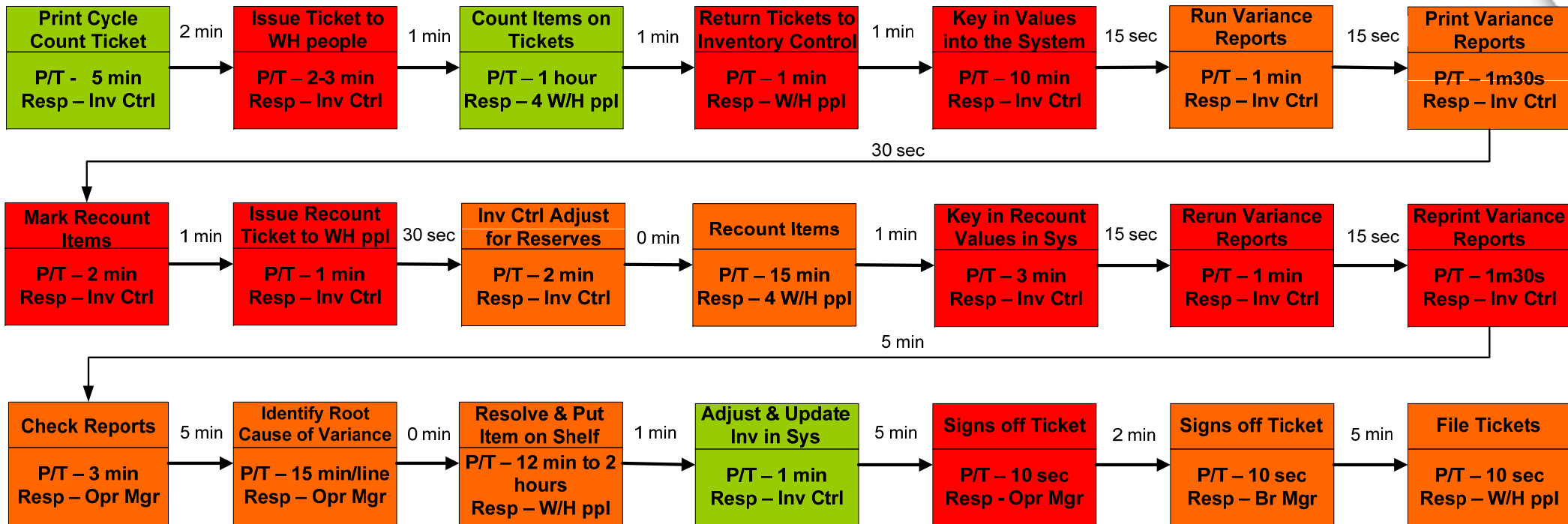
End Time – 10.38 am

No of items on cycle count ticket	- 69
No of items recounted	- 15
No of items with variance	- 5
Process Time	- 136 min
Wait Time	- 32 min
No of people involved – 4 W/H ppl + Inv Ctrl + Opr Mgr	

# Cycle Counting – A Lean Perspective



Start Time – 7.50 am



End Time – 10.38 am

No of items on cycle count ticket	- 69
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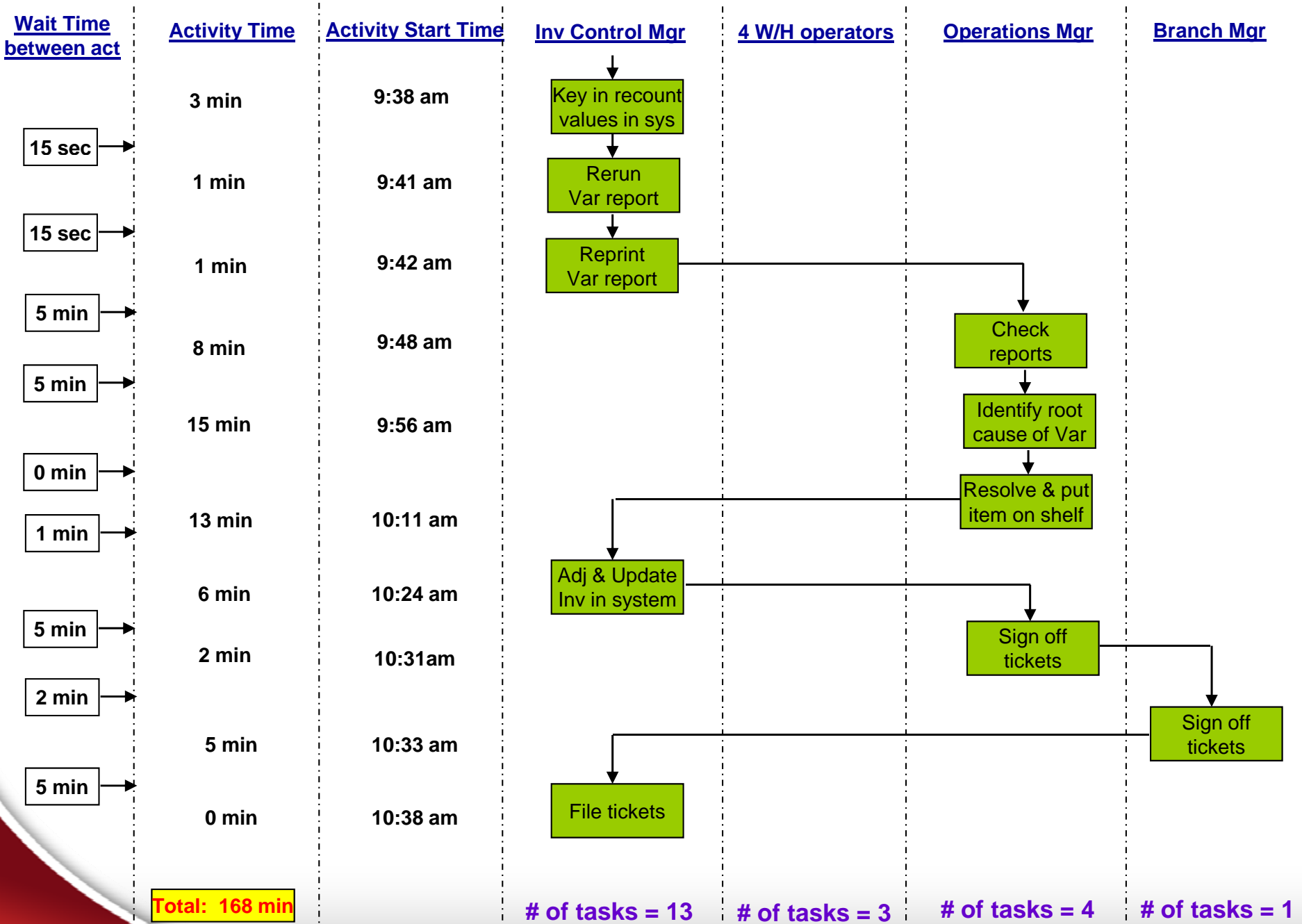
$$CVA = \frac{66}{168} = 39.28\%$$

$$BVA = \frac{49}{168} = 29.16\%$$

$$NVA = \frac{21+32}{168} = 31.54\%$$



# As-Is Process Flow – Activity Flow Diagram



## Cycle Counting – To-be Process – Future State VSM

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- Perform Inventory Stratification to identify A,B,C and D items
- Highlight A & B items when generating pick ticket and put away ticket – Task Interleaving (Combining multiple tasks)
- Employee will count ticked items during put away and picking processes
- This practice ensures high levels of inventory accuracy for fast moving items without any substantial investment in counting time
- Regular cycle counting procedure will be performed on C & D items only
- No formal cycle counting procedure will be performed on A & B items

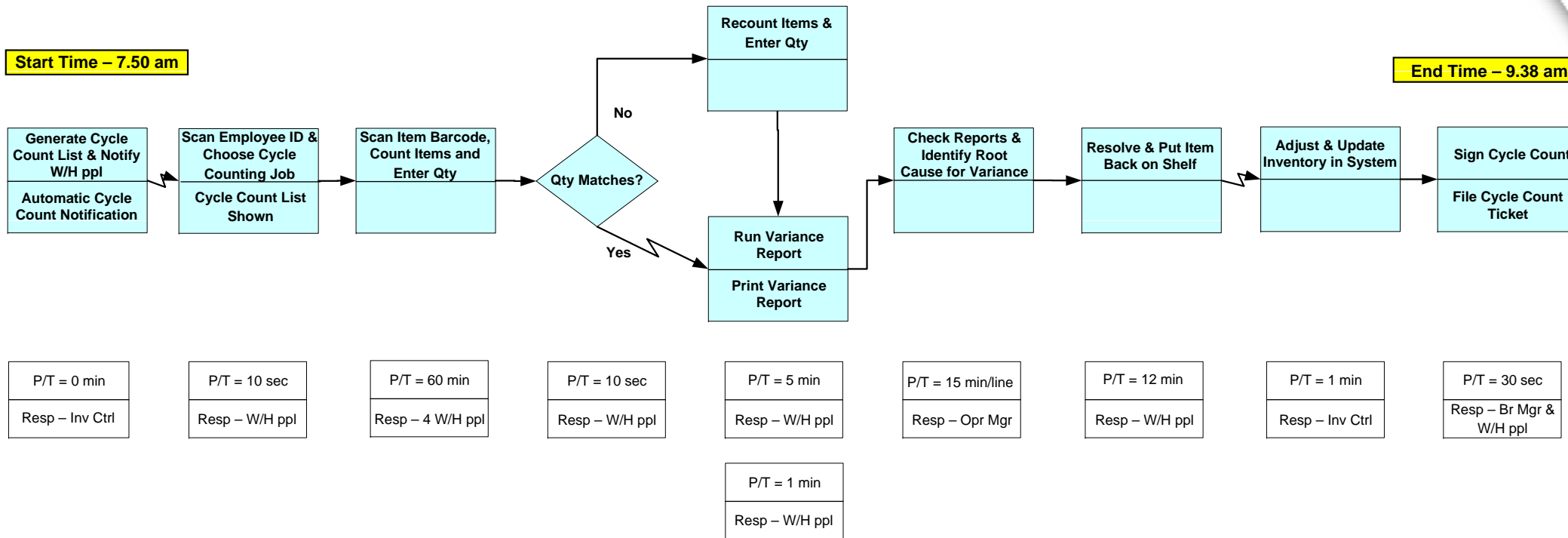
# To-be Process Flow



## Cycle Counting

Start Time – 7.50 am

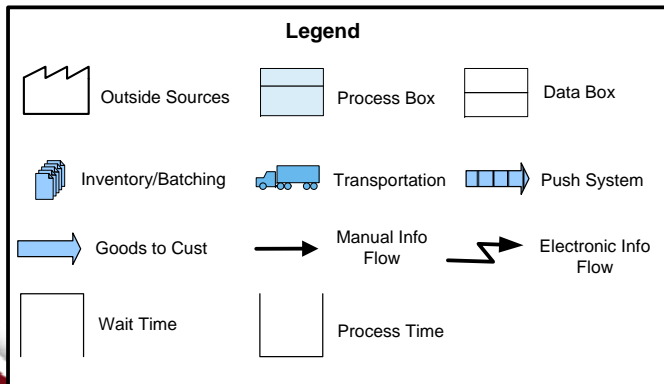
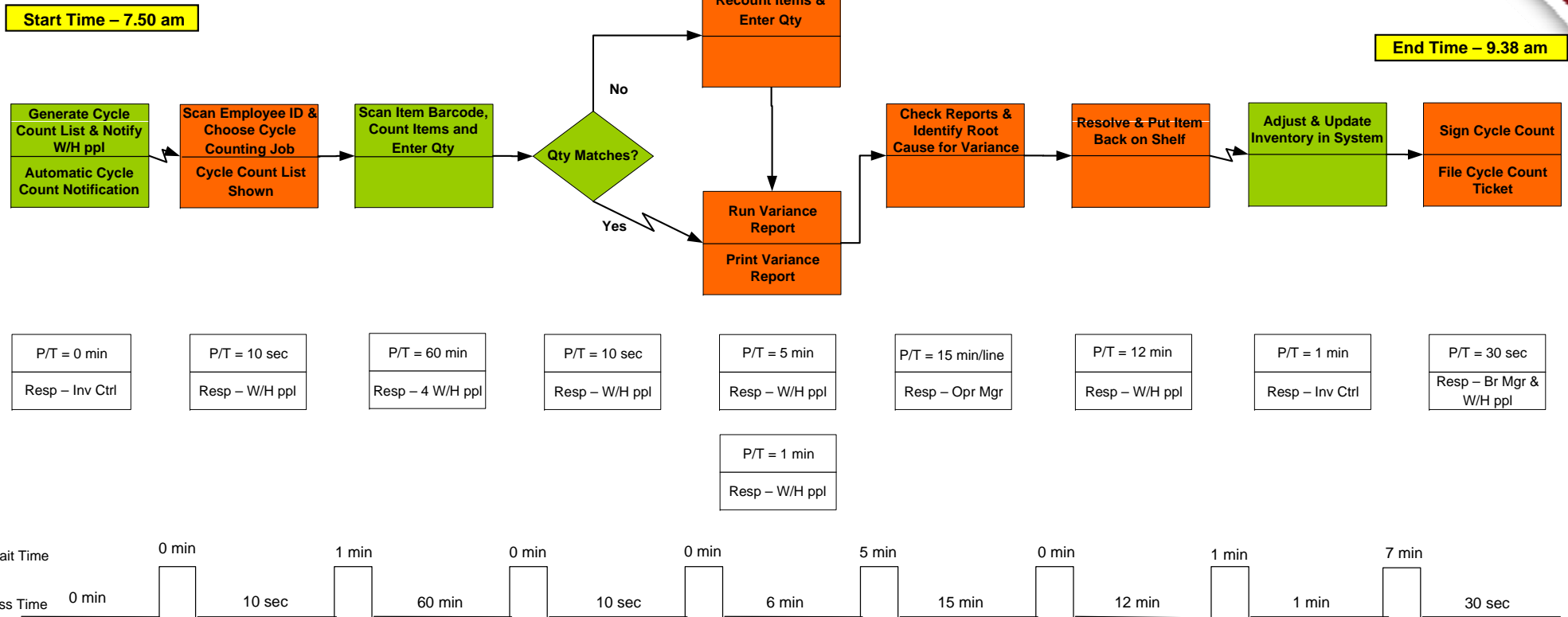
End Time – 9.38 am



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# To-Be/Future State VSM – A Lean Perspective

## Cycle Counting



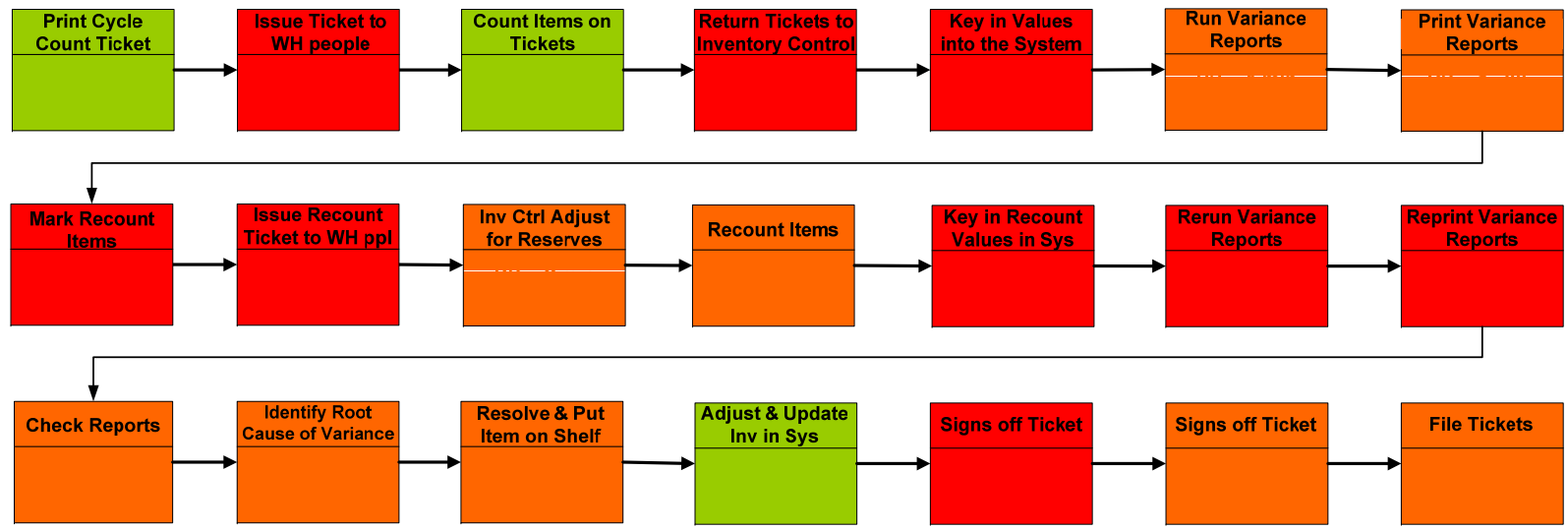
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<b>CVA</b>	$\frac{61}{108} = 56.4\%$
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<b>NVA</b>	$\frac{14}{108} = 12.9\%$

# As-Is Vs. To-Be Process Flows

## Cycle Counting

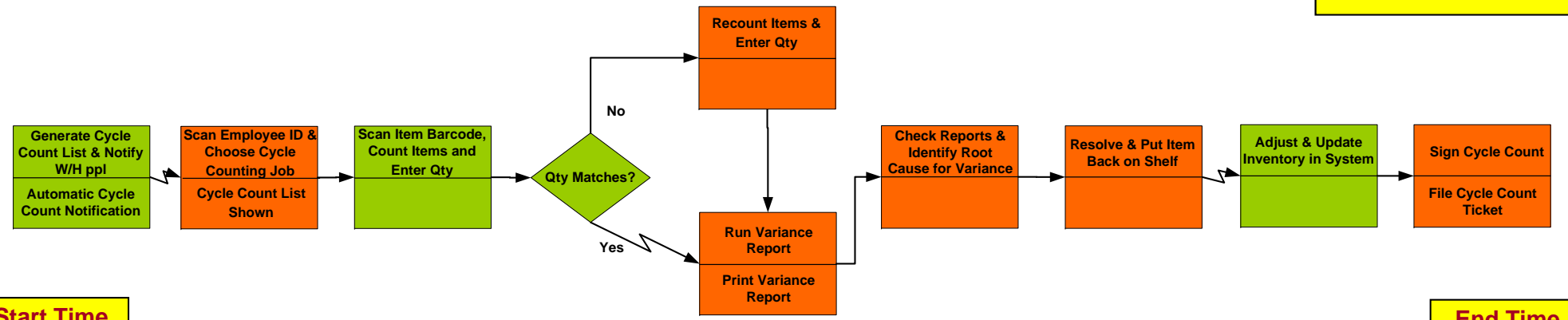
### AS-IS PROCESS



**Start Time**  
7:50 AM

**End Time**  
10:38 AM

### TO-BE PROCESS



**Start Time**  
7:50 AM

**End Time**  
9:38 AM

## Performance Metrics

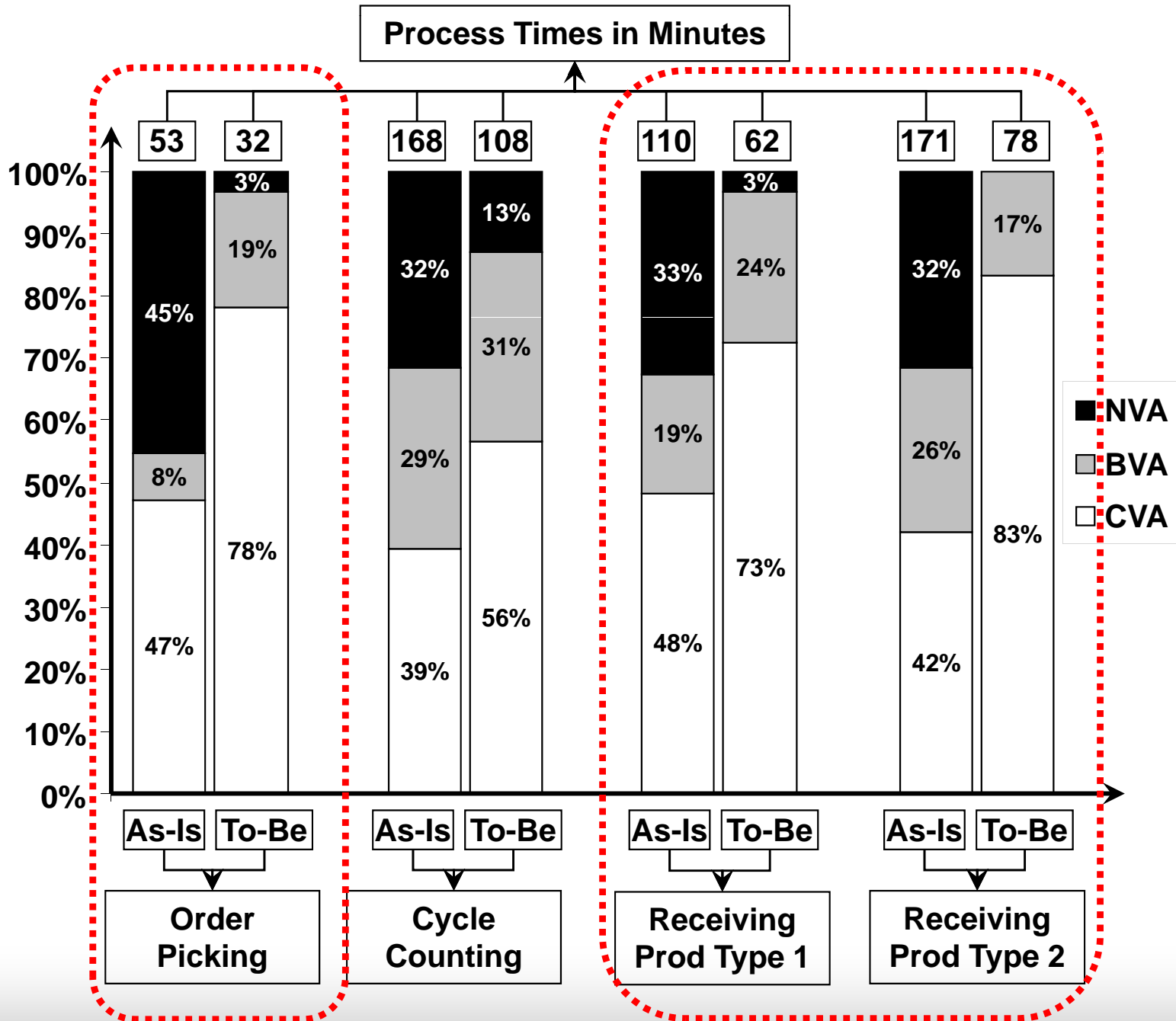
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Performance Metric	Impact
Cycle Count Accuracy	✓
On Time Delivery	✓
Over Stock	✓
Stock Out	✓
Customer Wait Time	✓
Gross Margin Return on Inventory Investment	✓
Earnings Before Interest and Tax	✓
Cycle Count Time	✓

## Cycle Counting – Process Improvement Results

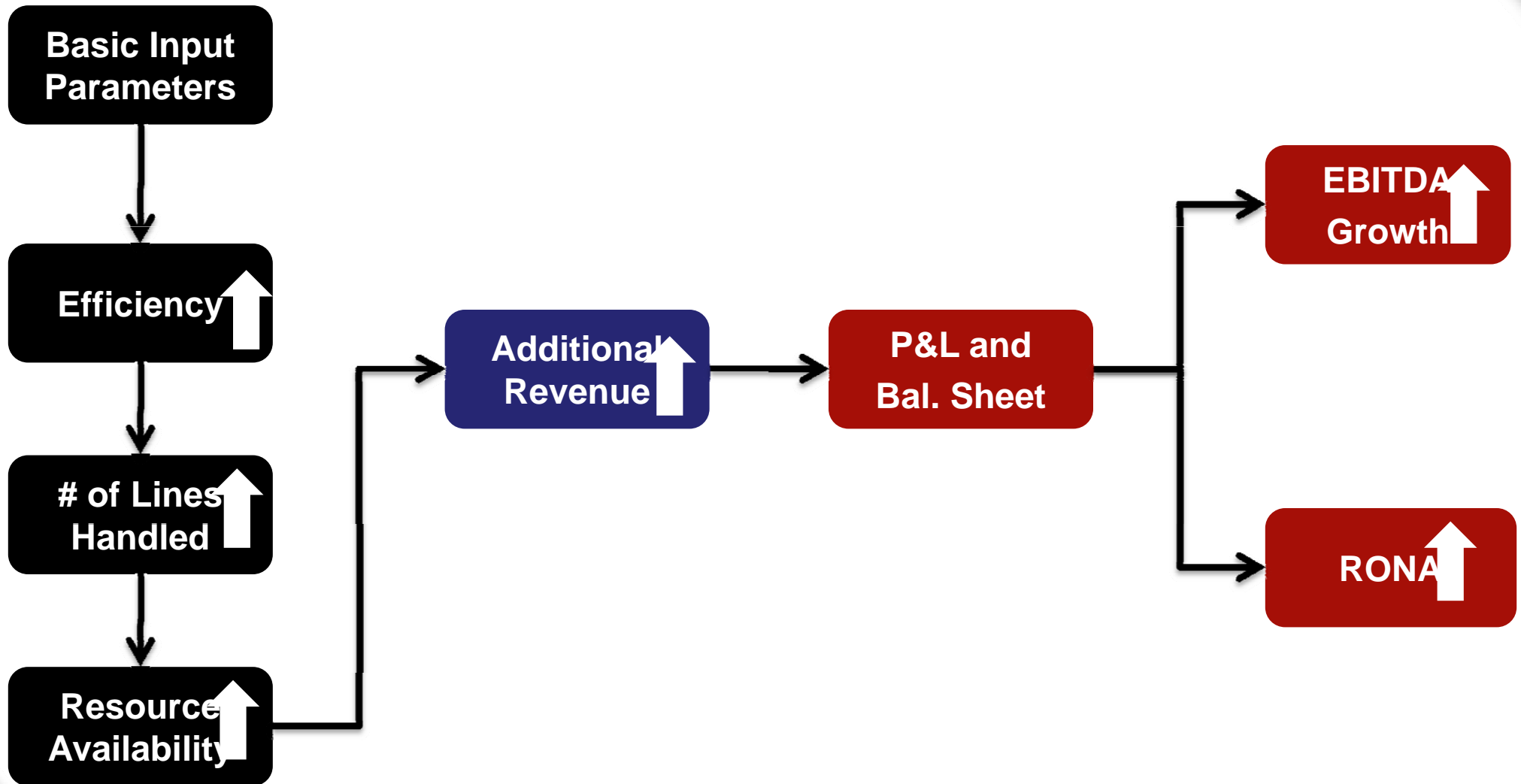
Category	As-Is Process	To-Be Process	% Change
Cycle Count Process Time	168 Min	108 Min	-36%
CVA	66 Min	61 Min	-8%
BVA	49 Min	33 Min	-33%
NVA	53 Min	14 Min	-74%
Total # of tasks	21	11	-48%
# of tasks - Inv Ctrl Mgr	13	2	-85%
# of tasks - WH Operator	3	7	133%
# of tasks - Ops Mgr	4	1	-75%
# of tasks - Branch Mgr	1	1	0%
# of Bar Code Scanners	0	4	
Employee Productivity Metric	No	Yes	

# Lean 10-step Implementation Summary





# Warehouse Efficiency (Order Picking & Receiving)



## Financial Statements – Typical Distributor

Financial Statements		Current		
Income Statement			Fixed	Variable
Net Sales	\$ 148,265,879	100%		
Cost of Goods Sold	\$ 110,902,877	74.8%	0%	100%
<b>Gross Margin</b>	<b>\$ 37,363,002</b>	<b>25.2%</b>		
Employee Compensation - Outside S	\$ 9,059,045	6.11%	25%	75%
Employee Compensation - Others	\$ 9,385,230	6.3%	90%	10%
Warehouse Expenses	\$ 4,477,630	3.0%	50%	50%
Delivery Expenses	\$ 4,536,936	3.1%	20%	80%
Other Operating Expenses (G&A)	\$ 2,194,335	1.5%	25%	75%
<i>Total Operating Expenses</i>	<i>\$ 29,653,176</i>	<i>20.0%</i>		
<b>Operating Margin</b>	<b>\$ 7,709,826</b>	<b>5.2%</b>		
Other Income	\$ -	0.0%		
Other Expenses	\$ -	0.0%		
<b>EBITDA</b>	<b>\$ 7,709,826</b>	<b>5.2%</b>		

Financial Statements		Current	
Balance Sheet			
<u>Assets</u>		<u>By Total Assets</u>	
Inventory	\$ 17,470,663	37.6%	
Accounts Receivables	\$ 18,829,767	40.6%	
Cash & Marketable Securities	\$ 1,990,029	4.3%	
Other Current Assets	\$ 1,978,468	4.3%	
<i>Total Current Assets</i>	<i>\$ 40,268,926</i>	<i>86.7%</i>	
Fixed & Non-current Assets	\$ 6,153,034	13.3%	
<b>Total Assets</b>	<b>\$ 46,421,960</b>	<b>100.0%</b>	
<u>Liabilities &amp; Net Worth</u>		<u>By Total Liabilities &amp; Net Worth</u>	
Accounts Payables	\$ 9,884,392	21.3%	
Notes Payable (Short-term Debt)	\$ 1,427,456	3.1%	
Other Current Liabilities	\$ 2,404,335	5.2%	
<i>Total Current Liabilities</i>	<i>\$ 13,716,183</i>	<i>29.5%</i>	
Long-term Liabilities	\$ 4,991,618	10.8%	
Net Worth Or Owner's Equity	\$ 27,714,159	59.7%	
<b>Total Liabilities &amp; Net Worth</b>	<b>\$ 46,421,960</b>	<b>100.0%</b>	

## Financial KPIs – Typical Distributor

<b>Financial KPIs</b>	<b>Current</b>
<b><u>CASH FLOW</u></b>	
DSO	46.4
DPO	32.5
DOI	57.50
Cash Conversion Cycle	71.3
Working Capital as a % of rev	17.9%
<b><u>PROFITABILITY</u></b>	
Gross Margin %	25.2%
EBITDA Margin %	5.2%
Personnel Productivity Ratio (PPR)	0.49
GMROI %	214%
% change in EBITDA \$	
<b><u>GROWTH</u></b>	
Revenue Growth %	5.3%
<b><u>ASSET EFFICIENCY</u></b>	
Asset Turnover	3.19
Receivables Turnover	7.9
Inventory Turnover	6.35
<b><u>RONA (EBITDA/Net Assets)</u></b>	<b>23.57%</b>

# Impact on Income Statement



## Profitability Analysis - Income Statement

Income Statement	Current Scenario	By Sales %	Fixed	Variable	To-Be Scenario	Formulae
Column	A	B	C	D	E	
Net Sales	\$ 148,265,879	100%			\$ 153,009,795	New Net Sales
Cost of Goods Sold (COGS)	\$ 110,902,877	74.8%	0%	100%	\$ 114,451,327	(A * C) + (New Net Sales * B * D)
<b>Gross Margin</b>	<b>\$ 37,363,002</b>	<b>25.2%</b>			<b>\$ 38,558,468</b>	<b>(New Net Sales - COGS)</b>
Employee Compensation - Outside Sales	\$ 9,059,045	6.11%	25%	75%	\$ 9,276,435	(A * C) + (New Net Sales * B * D)
Employee Compensation - Others	\$ 9,385,230	6.3%	90%	10%	\$ 9,415,259	(A * C) + (New Net Sales * B * D)
Warehouse Expenses	\$ 4,477,630	3.0%	50%	50%	\$ 4,549,263	(A * C) + (New Net Sales * B * D)
Delivery Expenses	\$ 4,536,936	3.1%	20%	80%	\$ 4,653,067	(A * C) + (New Net Sales * B * D)
Other Operating Expenses (G&A)	\$ 2,194,335	1.5%	25%	75%	\$ 2,246,992	(A * C) + (New Net Sales * B * D)
<i>Total Operating Expenses</i>	<i>\$ 29,653,176</i>	<i>20.0%</i>			<i>\$ 30,141,016</i>	
<b>Operating Margin</b>	<b>\$ 7,709,826</b>	<b>5.2%</b>			<b>\$ 8,417,452</b>	<b>Gross Margin - Total Operating Expenses</b>
Other Income	\$ -	0.0%			\$ -	
Other Expenses	\$ -	0.0%			\$ 141,682	Interest expense for additional accounts receivables and inventory @ 12%
<b>EBITDA</b>	<b>\$ 7,709,826</b>	<b>5.2%</b>			<b>\$ 8,275,770</b>	

# Impact on Balance Sheet



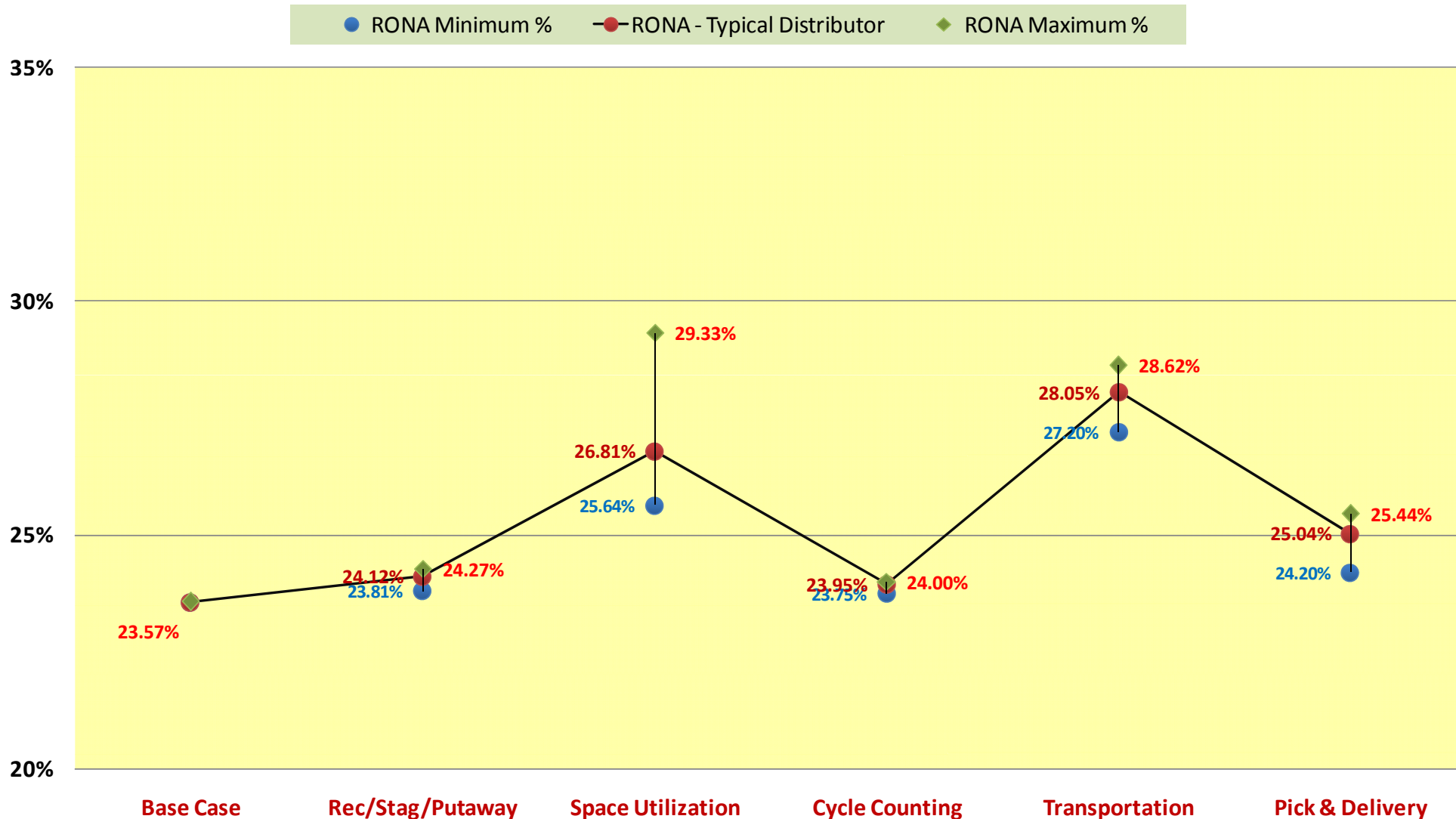
## Profitability Analysis - Balance Sheet

Balance Sheet	Current Scenario		To-Be Scenario	Formulae
<b>Assets</b>	<b>By Total Assets</b>			
Inventory	\$ 17,470,663	37.6%	\$ 18,030,004	Days Inventory Outstanding * (New COGS / 365)
Accounts Receivables	\$ 18,829,767	40.6%	\$ 19,451,108	Days Sales Outstanding * (New Net Sales / 365)
Cash & Marketable Securities	\$ 1,990,029	4.3%	\$ 1,990,029	
Other Current Assets	\$ 1,978,468	4.3%	\$ 1,978,468	
<b>Total Current Assets</b>	<b>\$ 40,268,926</b>	<b>86.7%</b>	<b>\$ 41,449,609</b>	
Fixed & Non-current Assets	\$ 6,153,034	13.3%	\$ 6,153,034	
<b>Total Assets</b>	<b>\$ 46,421,960</b>	<b>100.0%</b>	<b>\$ 47,602,643</b>	
<b>Liabilities &amp; Net Worth</b>	<b>By Total Liabilities &amp; Net Worth</b>			
Accounts Payables	\$ 9,884,392	21.3%	\$ 10,190,872	Days Payable Outstanding * (New COGS / 365)
Notes Payable (Short-term Debt)	\$ 1,427,456	3.1%	\$ 1,427,456	
Other Current Liabilities	\$ 2,404,335	5.2%	\$ 2,404,335	
<b>Total Current Liabilities</b>	<b>\$ 13,716,183</b>	<b>29.5%</b>	<b>\$ 14,022,663</b>	
Long-term Liabilities	\$ 4,991,618	10.8%	\$ 4,991,618	
Net Worth Or Owner's Equity	\$ 27,714,159	59.7%	\$ 28,588,362	
<b>Total Liabilities &amp; Net Worth</b>	<b>\$ 46,421,960</b>	<b>100.0%</b>	<b>\$ 47,602,643</b>	

Key Metrics	Current	Potential
Revenue Growth (Growth)	5.3%	8.3%
RONA (Asset Efficiency)	23.6%	24.6%
EBITDA (Profitability)	5.2%	5.4%

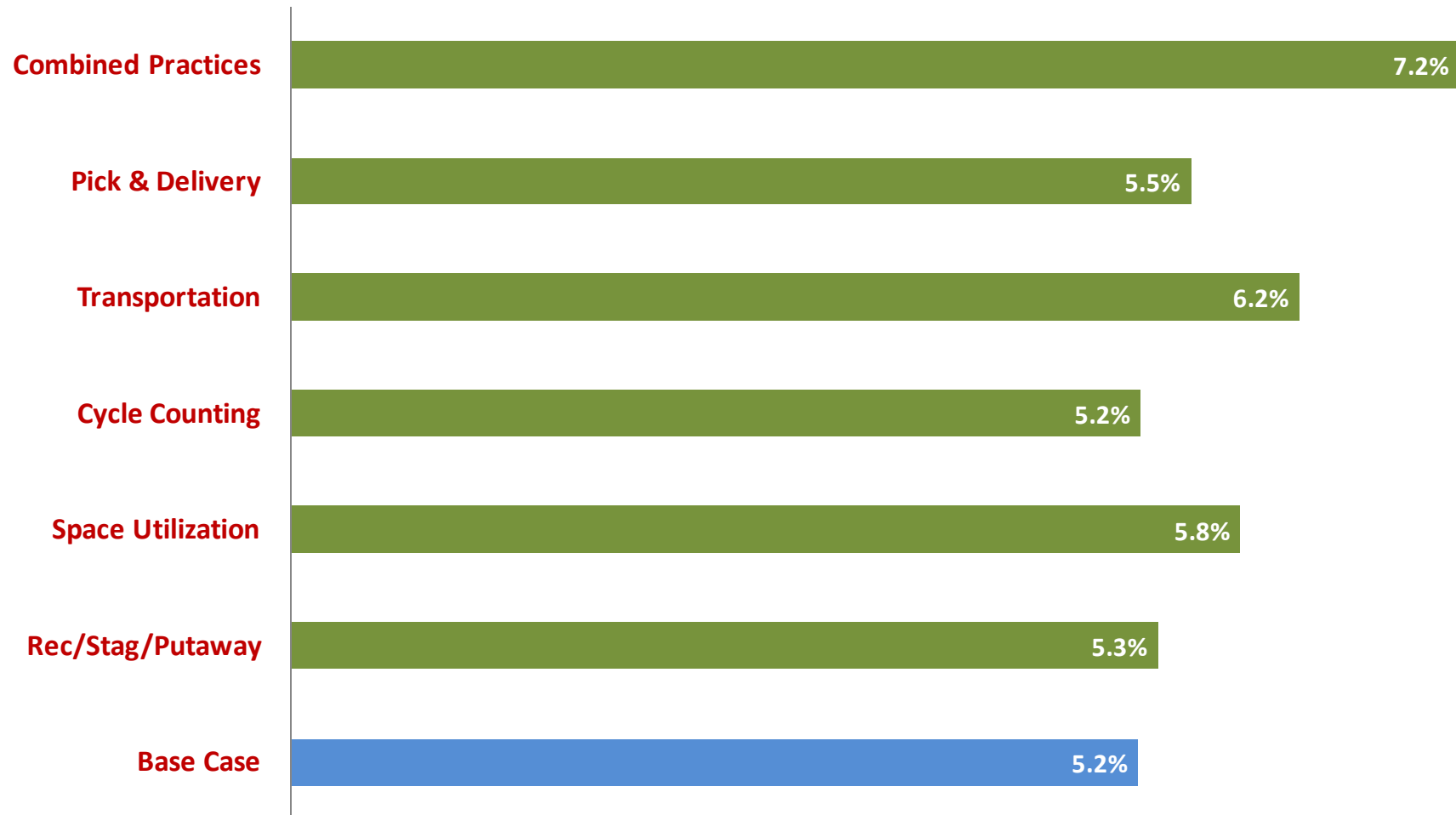
# Potential Profitability – Typical Distributor

## Potential Profitability Curve - STORE & SHIP



## Potential Profitability – Typical Distributor

### Impact of best practices on EBITDA % - Typical Distributor Return On Net Assets (RONA) - Typical Distributor





## Action Plan

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- Step 1: Form a process improvement team
- Step 2: Apply 10-step lean implementation framework.
- Step 3: Document the cost savings.
- Step 4: Determine impact on shareholder value
- Step 5: Share best practices.

## Summary

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- To be completed

## Thank You For Attending

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- Keynote – Gaining Competitive Advantage Through Lean Distribution
- F. Barry Lawrence, Ph.D.
- Please submit the Session Feedback Form
  - To receive NASBA credits, please be sure to complete the Session Feedback Form and sign the class roster in the back of the room



“Total Solutions For Industrial Distributors and Manufacturers”

# Thank You!

For more info please visit:

<http://supplychain.tamu.edu>