Inventory Management

What Am I Going to do with All this Stuff?

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LEVERAGING THE POWER OF PROCUREMENT
FORUM2014

Logistics

- lo·gis·tics lə'jistiks/, *noun*,

  the detailed coordination of a complex operation involving many people, facilities, or supplies.

  synonyms:organization, planning, plans, management, arrangement, administration, orchestration, coordination, execution, handling, running "the logistics of deploying forces in the field“

Department of Accounts (DOA) Guidance

- Topic No. 30505, Physical Inventory
- Topic No. 30515, Supplies and Materials Inventory

- The most important thing

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- Types of operations

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- Types of operations
- Inventory systems

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- Inventory processes

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- Inventory processes
- Performance measurements

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- Types of operations
- Inventory systems
- Inventory processes
- Performance measurements
- Obsolescence

THE MOST IMPORTANT THING

The Most Important Thing

Know Your Customers

Types of Operations

Warehouse

Distribution Center

Types of Operations

Warehouse

- Static storage

Distribution Center

- Focus on distributing items quickly

Types of Operations

Warehouse

- Static storage
- Slower turn around

Distribution Center

- Focus on distributing items quickly
- Faster turn around

Types of Operations

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Types of Operations

Warehouse

- Static storage
- Slower turn around
- Higher holding costs
- Tie up funds

Distribution Center

- Focus on distributing items quickly
- Faster turn around
- Lower holding costs
- Less funds tied up

Types of Operations

Warehouse

- Static storage
- Slower turn around
- Higher holding costs
- Tie up funds
- Inventory for emergency use

Distribution Center

- Focus on distributing items quickly
- Faster turn around
- Lower holding costs
- Less funds tied up

Type of Operation - Simple

Type of Operation - Complex

Physical Safety and Security

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- Protect employees and visitors from injury

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  - Personal protective equipment (PPE)

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  - Control access to storage areas
  - Security cameras
  - Guards

Inventory Systems

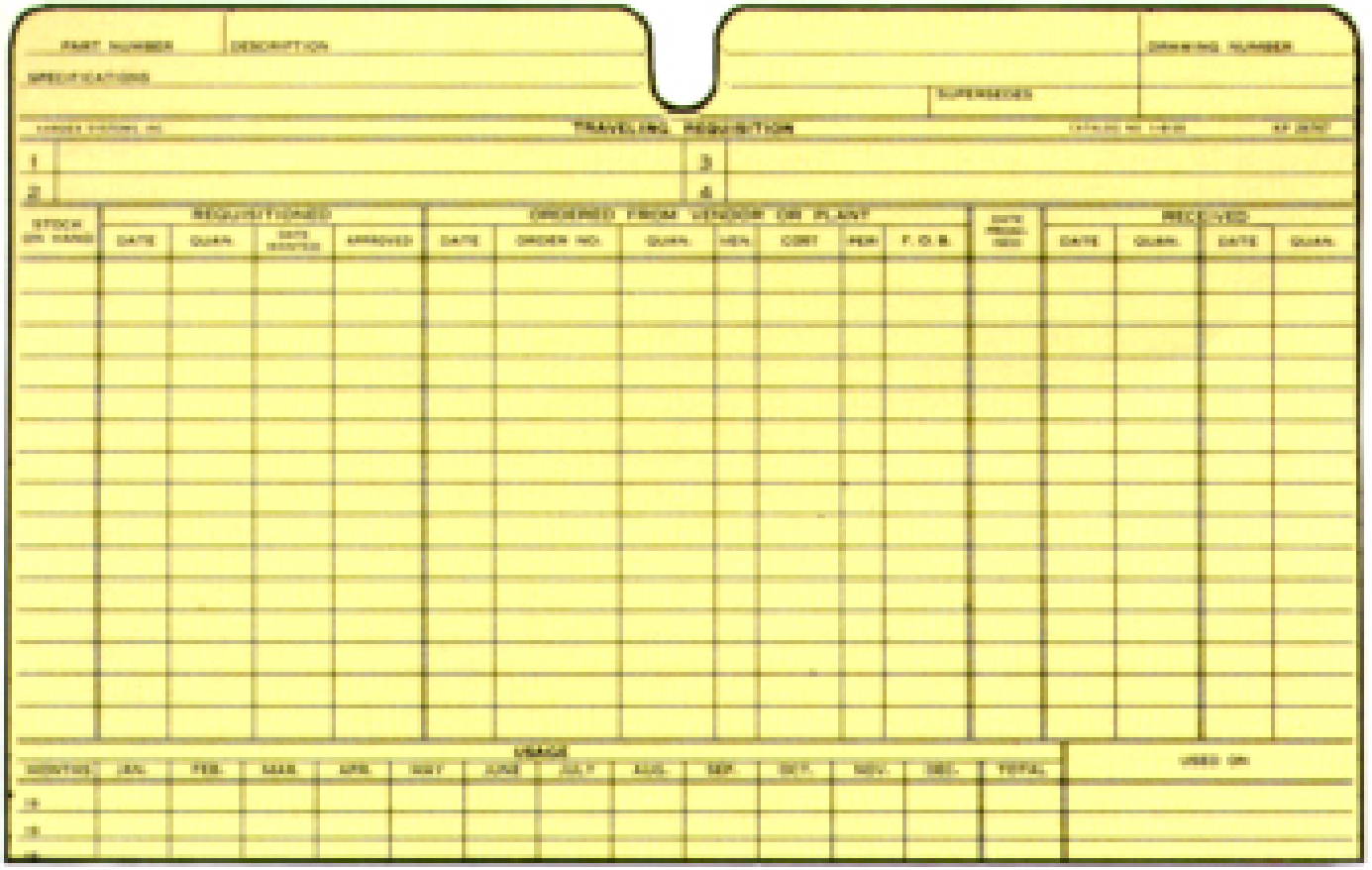
Inventory Systems

- Perpetual

Inventory Systems

- Perpetual
- Periodic

Inventory System – Paper Records



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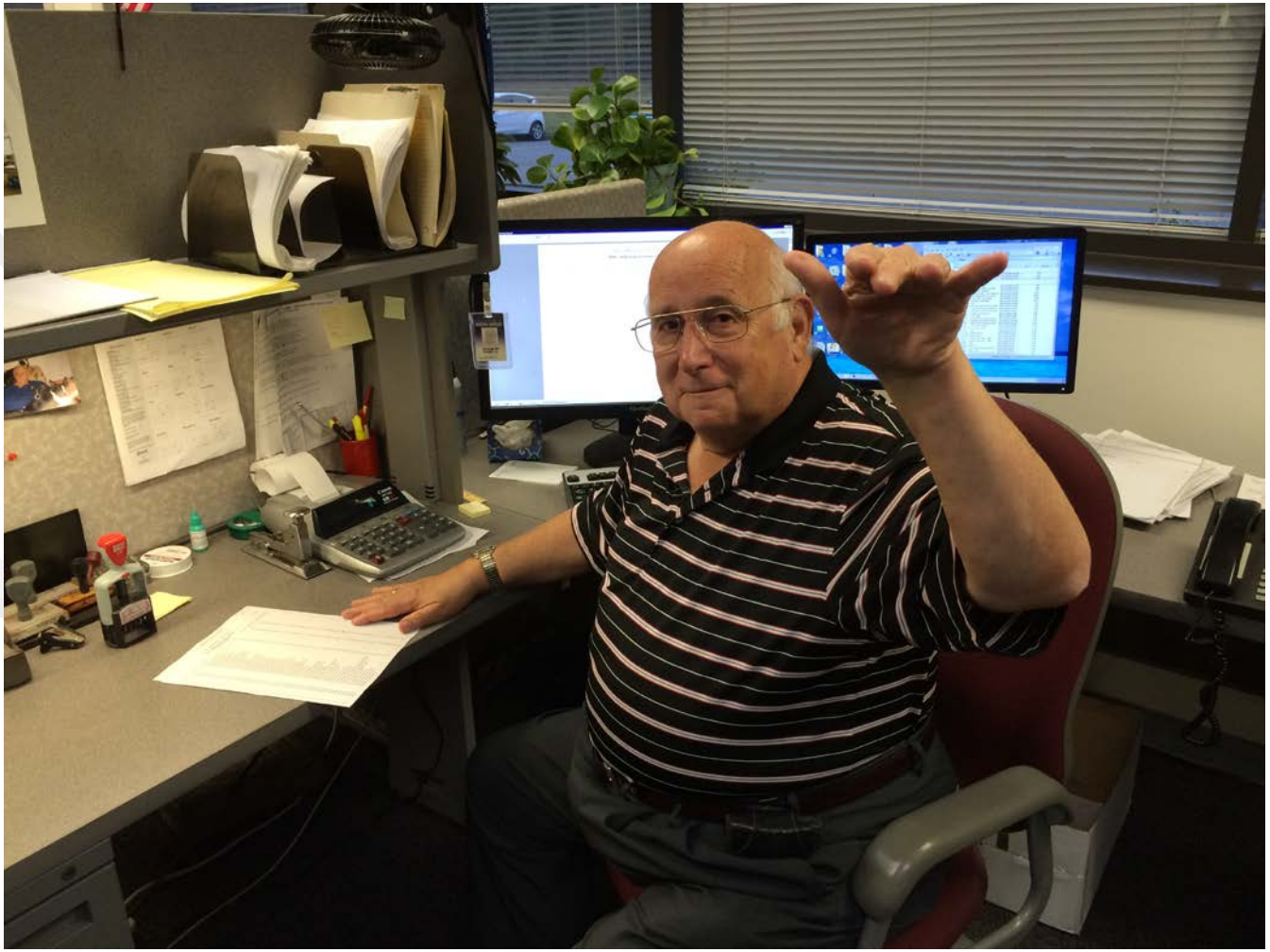
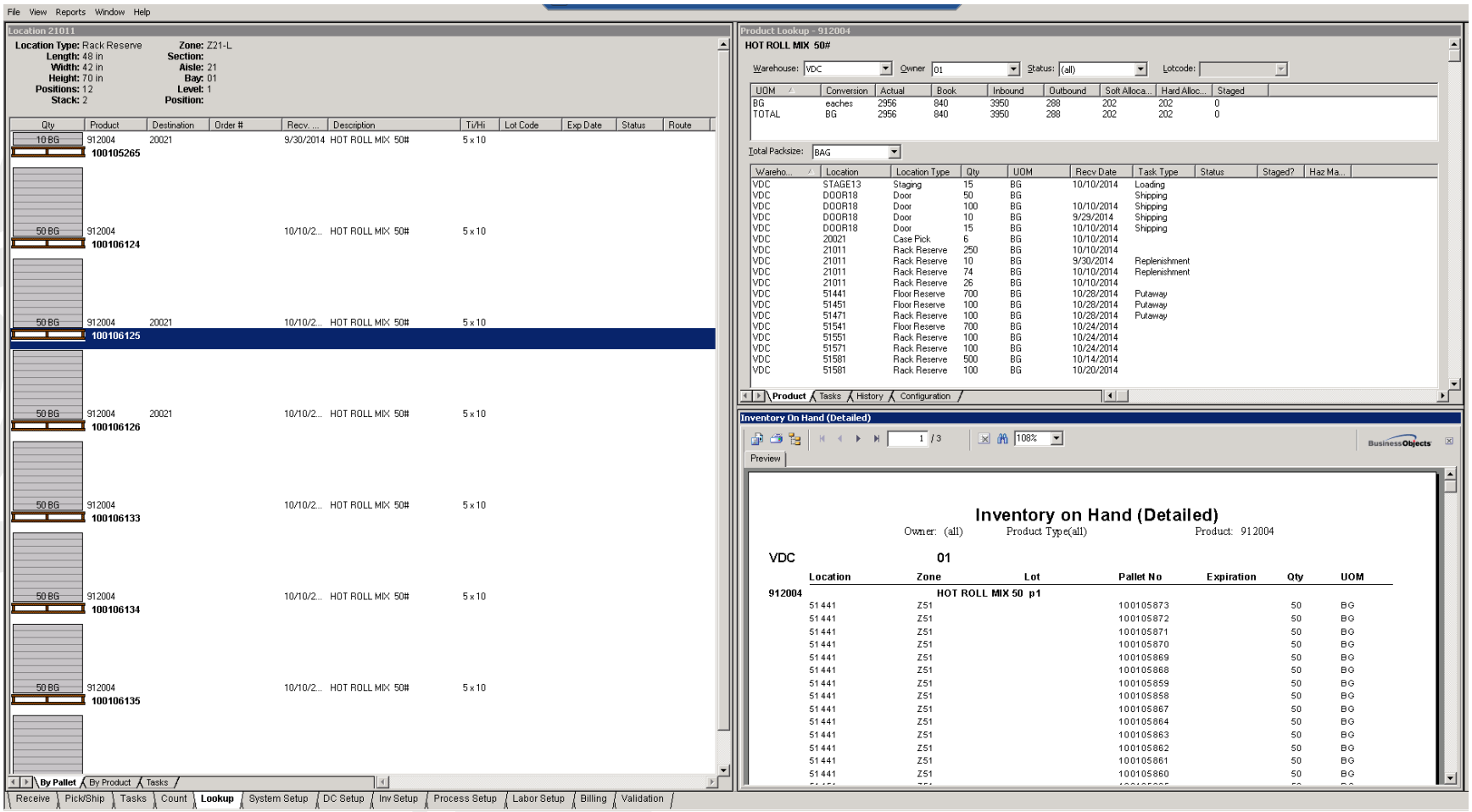


Inventory System – Excel Spreadsheet

	Widget	Thingamabob	Dodad	Whatchamajig
In Stock	**14**	**16**	**22**	**4**
Beginning Balance	10	15	20	25
Tom	-1		-3	
Dick		-4	-3	
Harry				-10
George				-8
Purchase	5	5	5	5
Sam (return)			3	
Pete				-8

Inventory System - COTS



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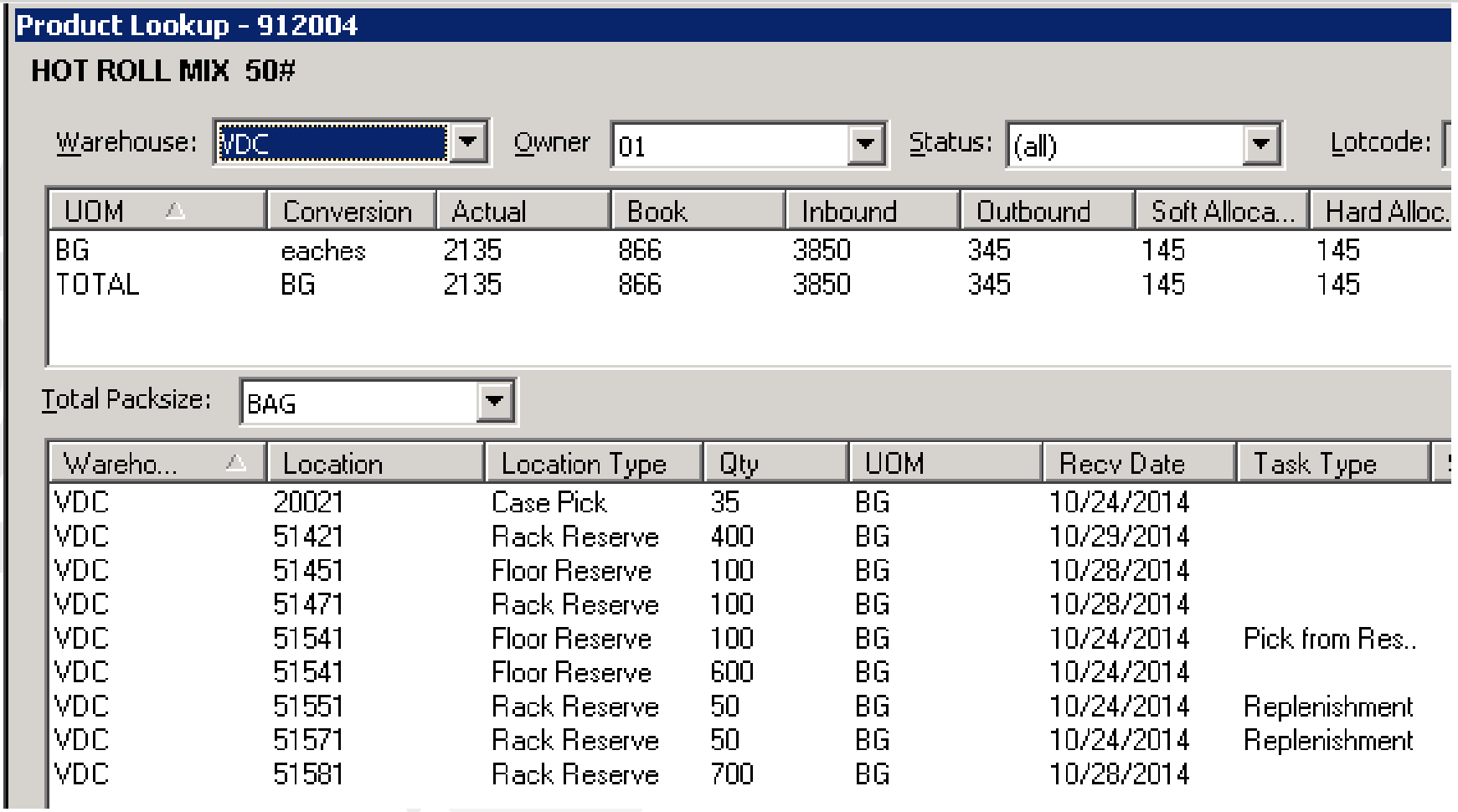

Product Lookup - 912004

HOT ROLL MIX 50#

Warehouse: VDC Owner: 01 Status: (all) Lotcode:

UOM	Conversion	Actual	Book	Inbound	Outbound	Soft Alloca...	Hard Alloc.
BG	eaches	2135	866	3850	345	145	145
TOTAL	BG	2135	866	3850	345	145	145

Total Packsize: BAG

Wareho...	Location	Location Type	Qty	UOM	Recv Date	Task Type
VDC	20021	Case Pick	35	BG	10/24/2014	
VDC	51421	Rack Reserve	400	BG	10/29/2014	
VDC	51451	Floor Reserve	100	BG	10/28/2014	
VDC	51471	Rack Reserve	100	BG	10/28/2014	
VDC	51541	Floor Reserve	100	BG	10/24/2014	Pick from Res..
VDC	51541	Floor Reserve	600	BG	10/24/2014	
VDC	51551	Rack Reserve	50	BG	10/24/2014	Replenishment
VDC	51571	Rack Reserve	50	BG	10/24/2014	Replenishment
VDC	51581	Rack Reserve	700	BG	10/28/2014	

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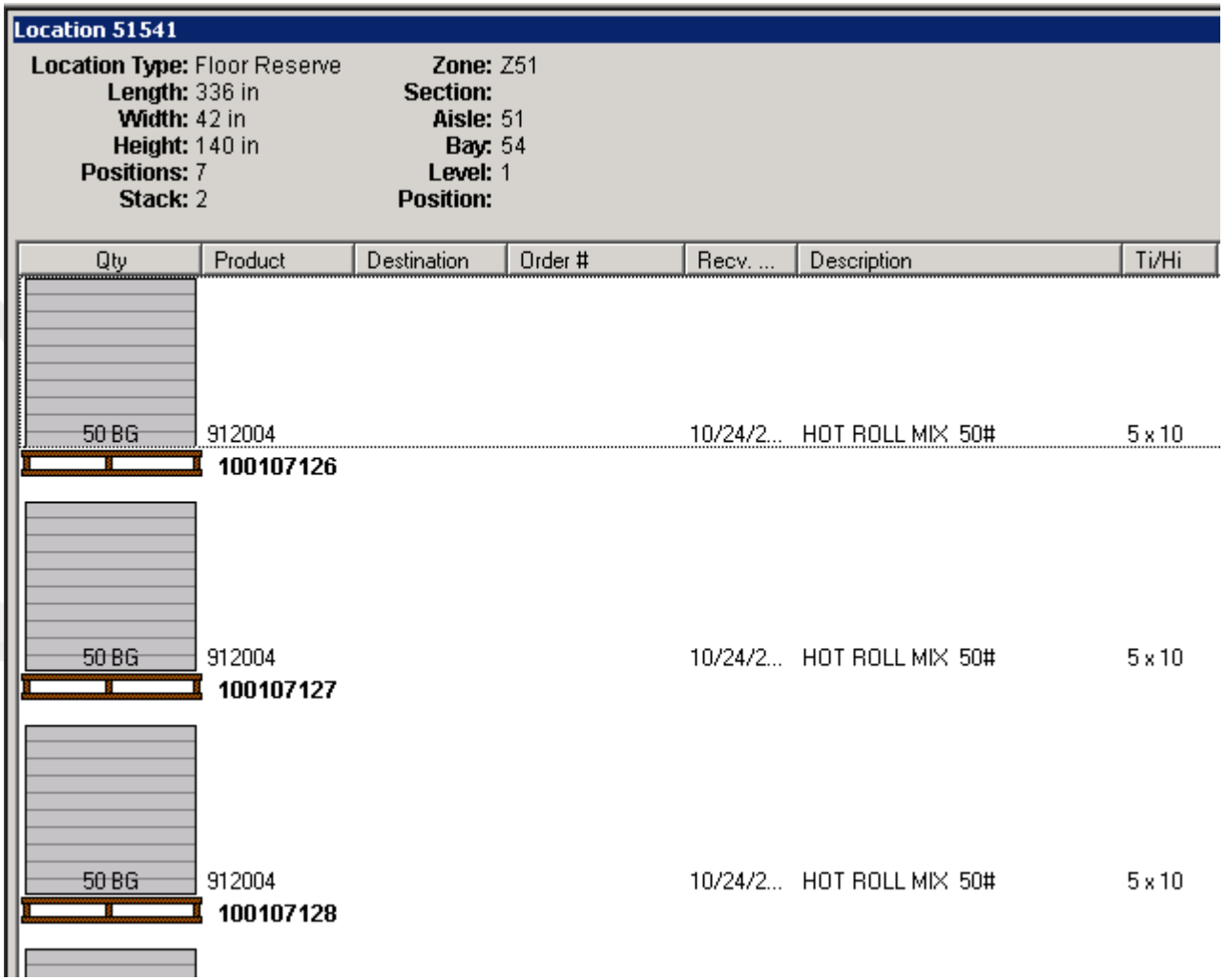

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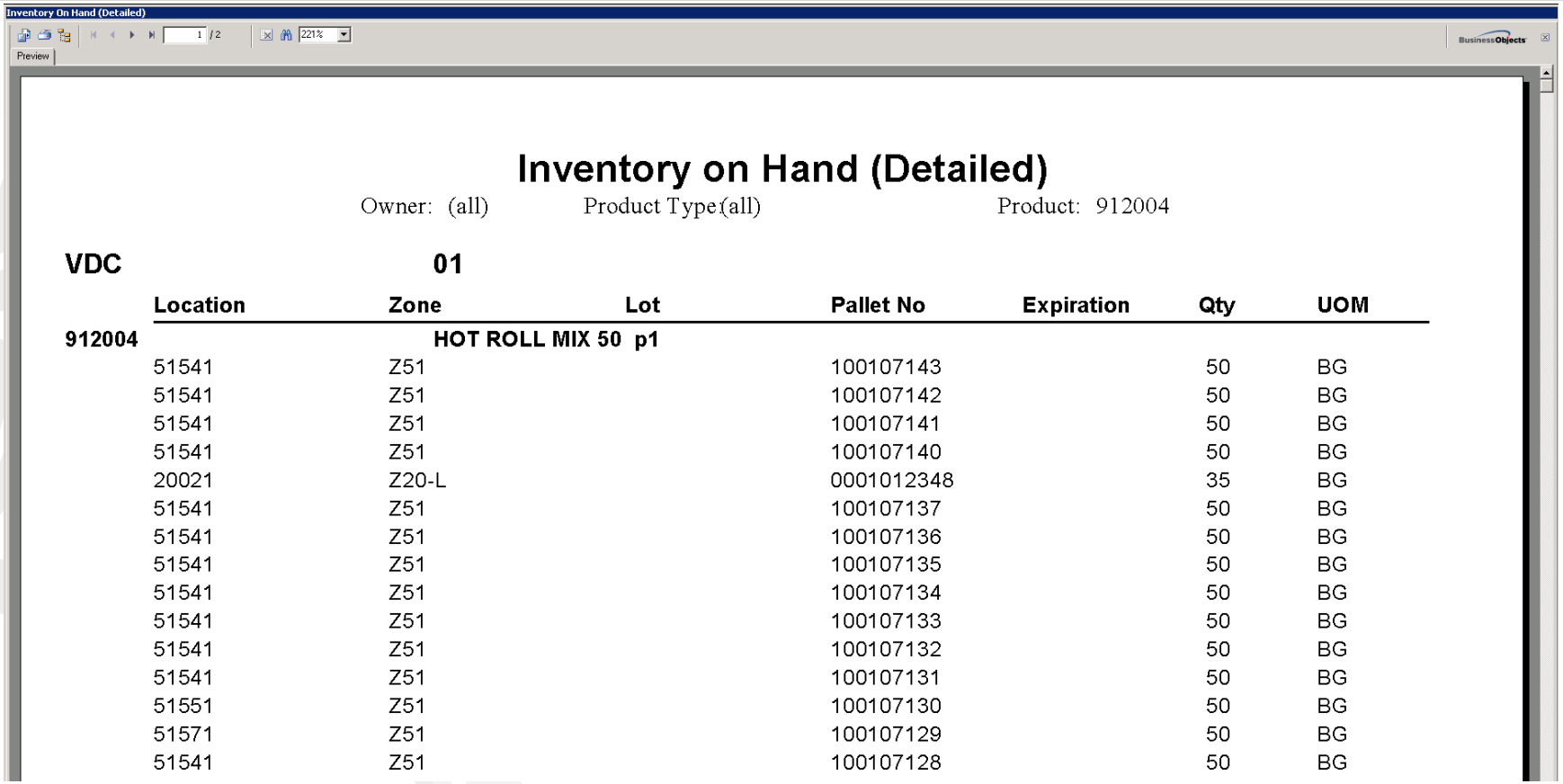

Inventory on Hand (Detailed)

Owner: (all) Product Type(all) Product: 912004

VDC **01**

	Location	Zone	Lot	Pallet No	Expiration	Qty	UOM
912004		**HOT ROLL MIX 50 p1**					
	51541	Z51		100107143		50	BG
	51541	Z51		100107142		50	BG
	51541	Z51		100107141		50	BG
	51541	Z51		100107140		50	BG
	20021	Z20-L		0001012348		35	BG
	51541	Z51		100107137		50	BG
	51541	Z51		100107136		50	BG
	51541	Z51		100107135		50	BG
	51541	Z51		100107134		50	BG
	51541	Z51		100107133		50	BG
	51541	Z51		100107132		50	BG
	51541	Z51		100107131		50	BG
	51551	Z51		100107130		50	BG
	51571	Z51		100107129		50	BG
	51541	Z51		100107128		50	BG

Inventory System - COTS

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Inventory Processes

Inventory Processes

- Receiving

Inventory Processes

- Receiving
- Quality Assurance

Inventory Processes

- Receiving
- Quality Assurance
- Storage (put away)

Inventory Processes

- Receiving
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- Stock Rotation

Inventory Processes

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- Order fulfillment

Inventory Processes

- Receiving
- Quality Assurance
- Storage (put away)
- Stock Rotation
- Order fulfillment
- Quality Control

Inventory Processes

- Receiving
- Quality Assurance
- Storage (put away)
- Stock Rotation
- Order fulfillment
- Quality Control
- Delivery

Inventory Processes

- Receiving

Inventory Processes

- Receiving
  - First line of defense

Inventory Processes

- Receiving
  - First line of defense
  - Unloading the goods

Inventory Processes

- Receiving
  - First line of defense
  - Unloading the goods
    - trained staff

Inventory Processes

- Receiving
  - First line of defense
  - Unloading the goods
    - trained staff
    - material handling equipment

Inventory Processes

- Receiving
  - First line of defense
  - Unloading the goods
    - trained staff
    - material handling equipment
  - The receiver should have a copy of the purchase order (PO)

Inventory Processes

- Receiving
  - First line of defense
  - Unloading the goods
    - trained staff
    - material handling equipment
  - The receiver should have a copy of the purchase order (PO)
  - Compare delivery documentation, such as the PO & Bill of Lading (BOL), to the actual goods received.

Inventory Processes

- Receiving (concluded)
  - Inspect the goods for quantity and damage.

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  - Document the quantity and quality on the vendor's paperwork and maintain a copy.

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  - Inspect the goods for quantity and damage.
  - Document the quantity and quality on the vendor's paperwork and maintain a copy.
  - If you sign a BOL without noting any deficiencies, especially quantity differences, the vendor will invoice for the full amount.
  - Ensure goods are entered in your inventory system before they are used.

Inventory Processes

- Quality Assurance

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Inventory Processes

- Storage (put away)

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  - FIFO

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- Order fulfillment

Inventory Processes

- Quality Control

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- Quality Control
  - Check accuracy

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Inventory Processes

- Quality Control
  - Check accuracy
  - Prepare for delivery

Inventory Processes

- Delivery

Inventory Processes

- Delivery
  - Proper handoffs

Inventory Processes

- Delivery
  - Proper handoffs
  - Proof of delivery

Inventory Counts

Inventory Counts

- Full Inventory Counts

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- Cycle Counts

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  - Randomized schedule

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  - ABC Methodology (Pareto's 80/20 Rule)

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Class	% of Items	% of $ Value
A	10%	70%
B	20%	20%
C	70%	10%

Discipline

Forecasting

Forecasting

- Communication with Customer

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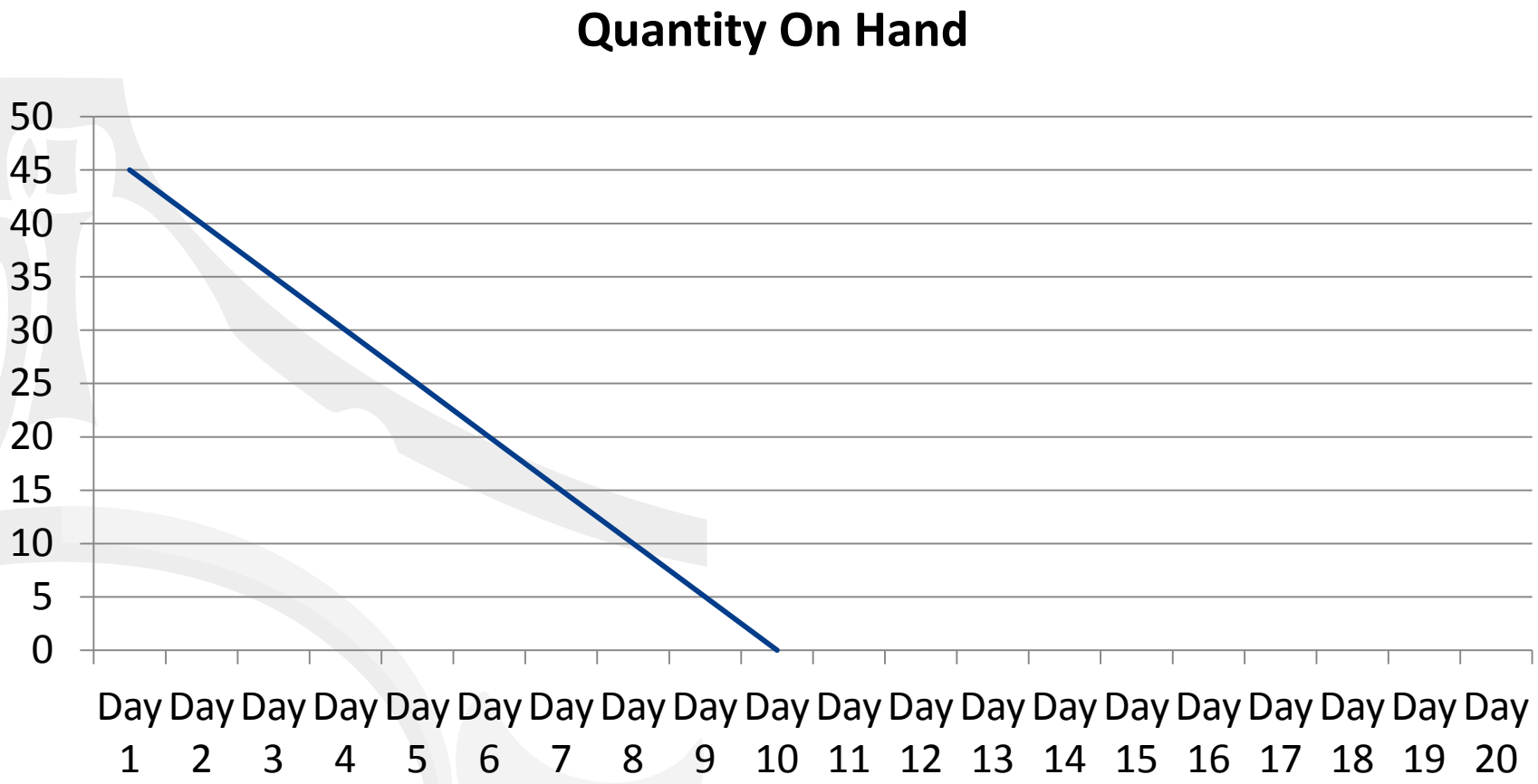
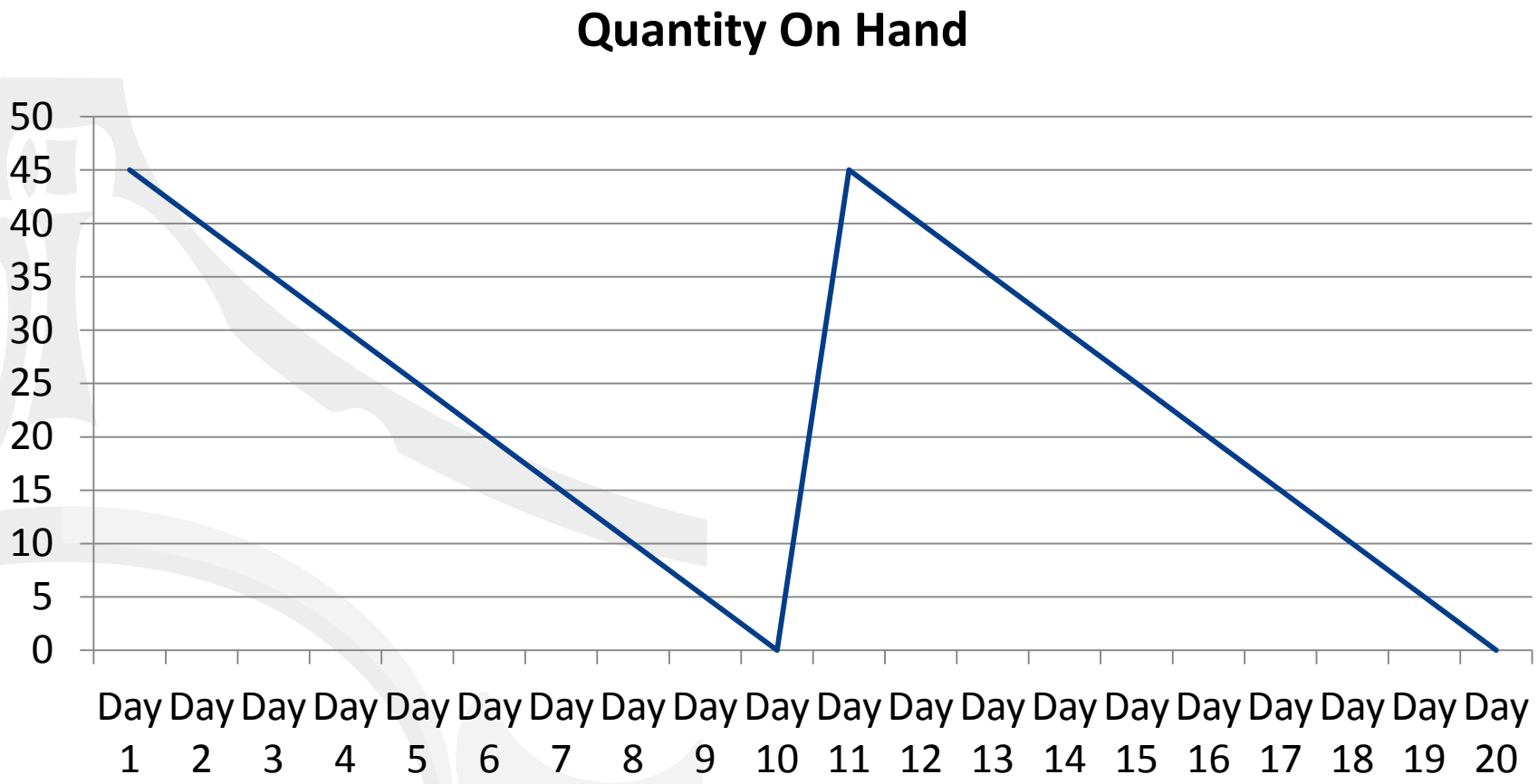
- Usage rates

Forecasting



Forecasting



Forecasting

- Communication with Customer
- Usage rates

Forecasting

- Communication with Customer
- Usage rates
- Lead time

Forecasting

- Communication with Customer
- Usage rates
- Lead time
  - Order processing time

Forecasting

- Communication with Customer
- Usage rates
- Lead time
  - Order processing time
  - Supplier lead time

Forecasting

- Communication with Customer
- Usage rates
- Lead time
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  - Supplier lead time
  - Transportation time

Forecasting

- Communication with Customer
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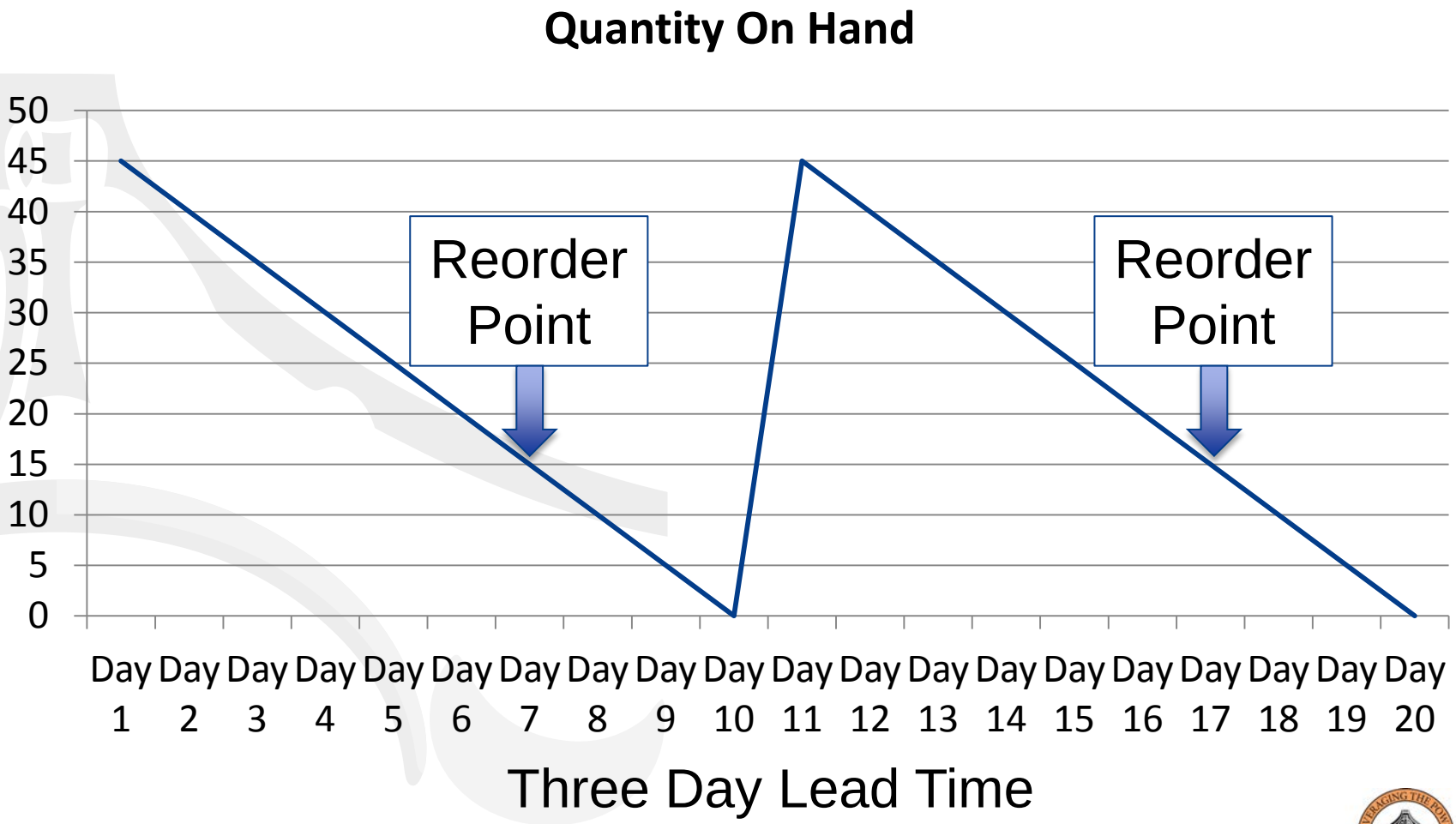
  - Receiving time

Forecasting

- Communication with Customer
- Usage rates
- Lead time
- Reorder point

Forecasting



Forecasting

- Communication with Customer
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Forecasting

- Communication with Customer
- Usage rates
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- Safety Stock

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Low safety stock levels	
•High confidence in on-time delivery •Low demand variance	

Forecasting

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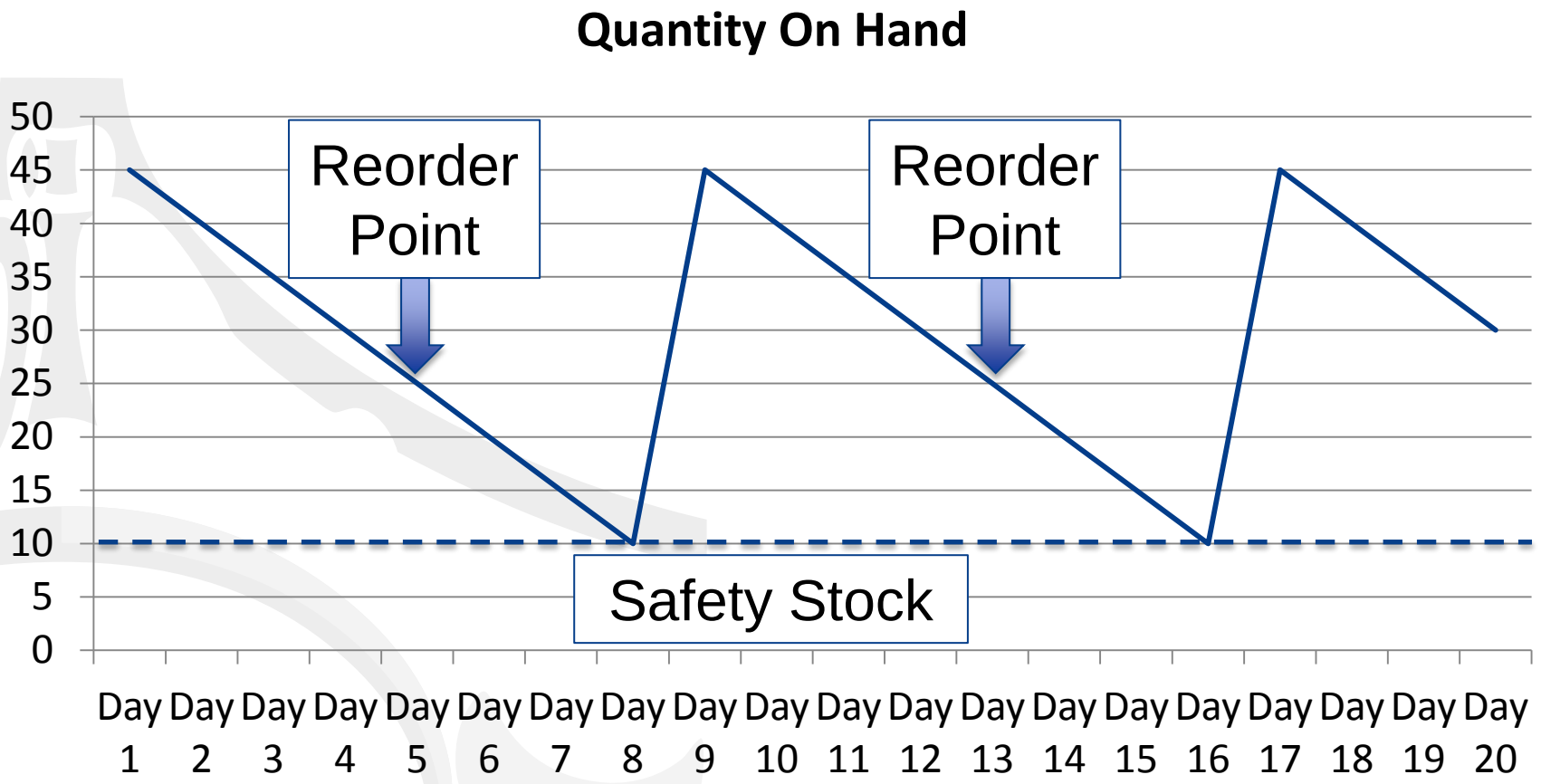
Forecasting



Three Day Lead Time
Safety Stock = 10 units

Forecasting

- Communication with Customer
- Usage rates
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Forecasting

- Communication with Customer
- Usage rates
- Lead time
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- Minimum Quantities

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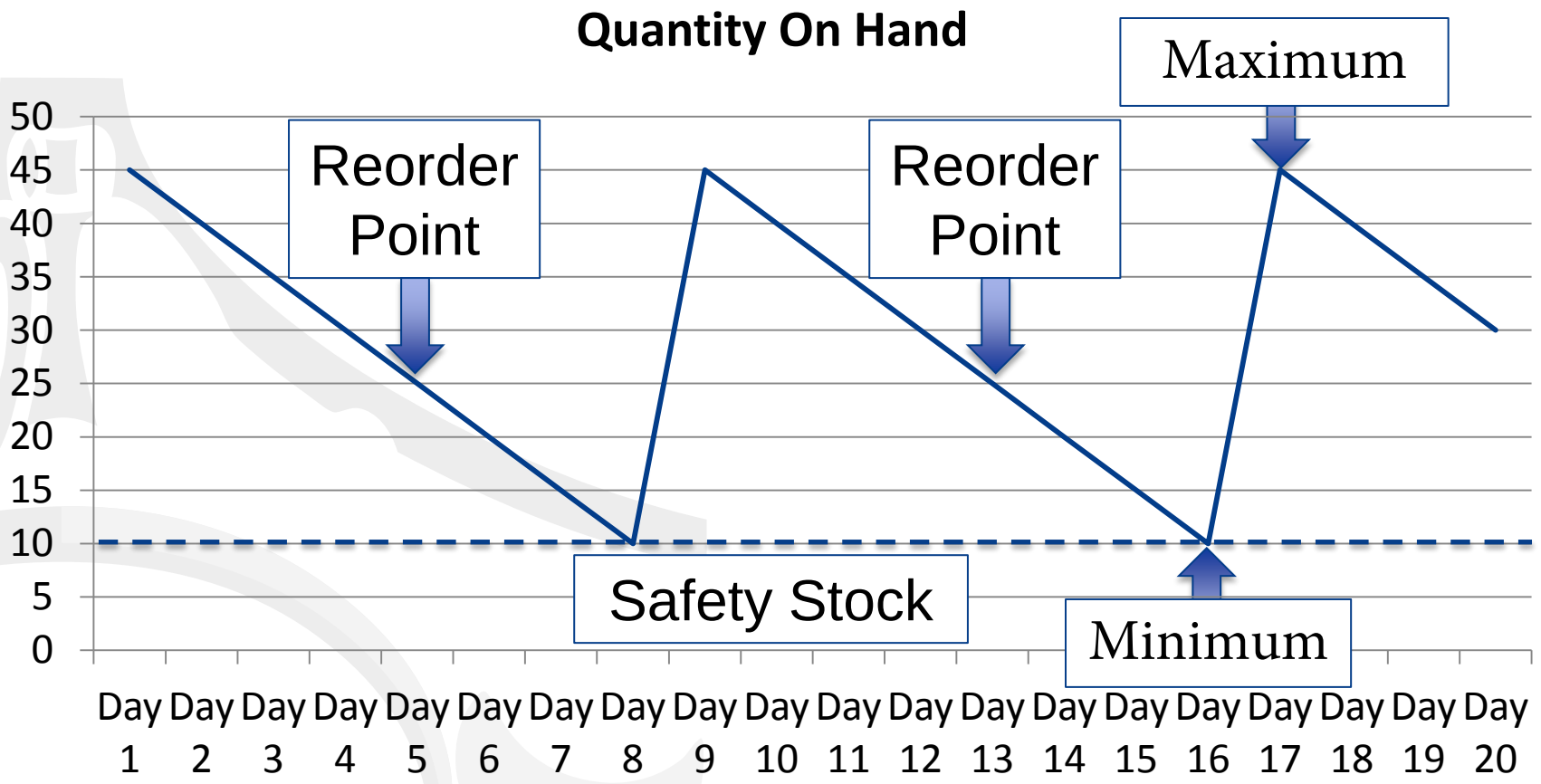
Forecasting



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Forecasting

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- Safety Stock
- Minimum Quantities
- Maximum Quantities

Forecasting

- Communication with Customer
- Usage rates
- Lead time
- Reorder point
- Safety Stock
- Minimum Quantities
- Maximum Quantities
- Seasonal Demand

Forecasting

- Communication with Customer
- Usage rates
- Lead time
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- Safety Stock
- Minimum Quantities
- Maximum Quantities
- Seasonal Demand
- Critical Path Method (CPM)

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- Less likely to be able to take advantage of bulk rates
- Not appropriate for organizations required to receive three or more bids.

Performance Measurement

Performance Measurement

$$\text{Number of days In Inventory} = \frac{365}{\text{inventory turnover ratio}}$$

$$\text{Total Asset Turnover} = \frac{\text{sales}}{\text{total assets}}$$

$$\text{Working Capital Turnover} = \frac{\text{net sales}}{\text{average working capital}}$$

Performance Measurement

Number of days In Inventory	=	$\frac{365}{\text{inventory turnover ratio}}$
Current Ratio	=	$\frac{\text{current assets}}{\text{current liablilities}}$
Total Asset Turnover	=	$\frac{\text{sales}}{\text{total assets}}$
Acid Test (or Quick Ratio)	=	$\frac{\text{cash+net rcvbls+mkt scrts}}{\text{current liabilities}}$
Working Capital Turnover	=	$\frac{\text{net sales}}{\text{average working capital}}$

Performance Measurement

Number of days Inventory	=	365 / Inventory Turnover Ratio
Inventory Turnover Ratio	=	Cost of Goods Sold / average inventory
Receivables Turnover Ratio	=	net credit sales / average accounts receivable
Number of Days of Receivables	=	365 / Receivables Turnover Ratio
Total Asset Turnover	=	net sales / average total assets
Acid Test (or Quick Ratio)	=	cash+net rcvbls+mkt scrts / current liabilities
Working Capital Turnover Ratio	=	net sales / average net working capital

Performance Measurement

Number of days = Cost of Goods Sold / 365

Debt-equity ratio = total liabilities / total assets

Current Ratio = current assets / current liabilities

Profit Margin = net income / net sales

Total Asset Turnover Ratio = net sales / total assets

Return on Assets = net income / total assets

Acid Test (or Quick Ratio) = cash+net rcvbls+mkt scrts / current liabilities

Working Capital Turnover Ratio = net sales / average working capital

Inventory Turnover Ratio = average inventory / cost of goods sold

Receivables Turnover Ratio = average accounts receivable / net sales

Total Asset Turnover Ratio = net sales / average total assets

Number of Days Sales Outstanding = 365 / receivables turnover ratio

Performance Measurement

Inventory Accuracy

Fill Rate

Inventory Turnover Ratio

Performance Measurement

$$\text{Inventory Accuracy} = \frac{\text{pre-count inventory} - \text{the sum of the variances*}}{\text{pre-count inventory}}$$

Note: the sum of the variances should be an absolute value

Performance Measurement

Fill Rate =

$$\frac{\text{number of units correctly filled}}{\text{number of units ordered}}$$

Performance Measurement

Inventory Turnover Ratio (Turn Rate) =

$$\frac{\text{Cost of Goods Sold}}{\text{average inventory}}$$

Performance Measurement

$$\text{Inventory Turnover Ratio (Turn Rate)} = \frac{\text{beg inv + purchases – returns – end inv}}{\left(\frac{\text{beg inv + end inv}}{2}\right)}$$

Performance Measurement

Fill Rate vs. Turn Rate

Performance Measurement

Customer Survey

Inventory Obsolescence

Inventory Obsolescence

- Minimize losses

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- Minimize losses
  - Communicate with customers

Inventory Obsolescence

- Minimize losses
  - Communicate with customers
  - Rotate inventory

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- Minimize losses
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  - Monitor expiration dates

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  - Need their permission to dispose of property

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  - Need their permission to dispose of property
  - They can help you get the salvage value of the item

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- Surplus Property Program
  - Previously owned items at great prices
  - Need their permission to dispose of property
  - They can help you get the salvage value of the item
  - GovDeals.com

- Types of operations
- Inventory systems
- Inventory processes
- Performance measurements
- Obsolescence
- Customers - The most important thing

Questions?

Audit

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- Inventory Observation

Audit

- Inventory Observation
- Management Assertions

Audit

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- Management Assertions
  - Existence or Occurrence

Audit

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  - Rights and Obligations

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  - Rights and Obligations
  - Valuation or Allocations

Audit

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  - Rights and Obligations
  - Valuation or Allocations
  - Presentation and Disclosure

Audit

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Audit

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Records Actual Goods

Audit

- Existence or Occurrence

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- High dollar items

Audit

- Existence or Occurrence

  Records Actual Goods

- Completeness

  Records Actual Goods

- High dollar items
- High volume items

Questions?

Resources

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