Training for European Logistician - Managerial level (ESLog) LEVEL 6

MODULE C :

PROCESS MANAGEMENT

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Managing Director Logistics Way
President of Cold Storage & Logistics Association

1

1

ESlog – LEVEL 6

PROCESS MANAGEMENT

Contents :

2

2

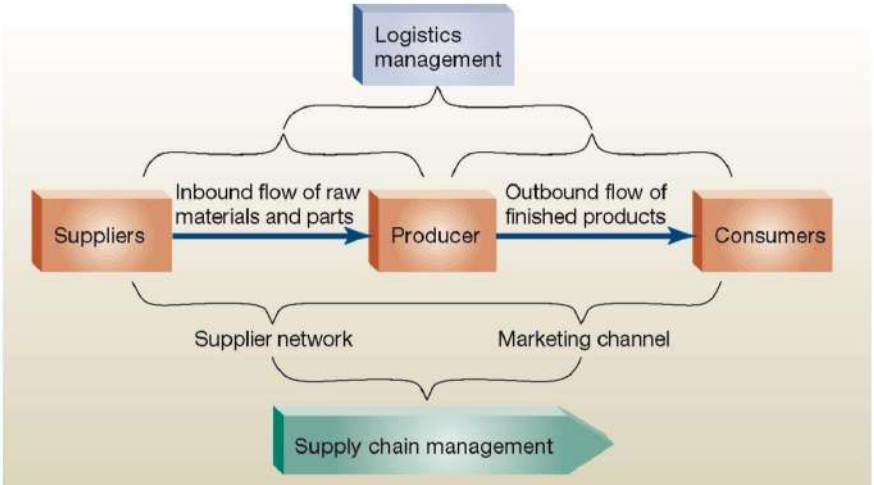
A thought of the moment!!!

What is Logistics = *Logical thinking + Statistics*

3

3

Marketing channels connect, Logistics management and supply chain management



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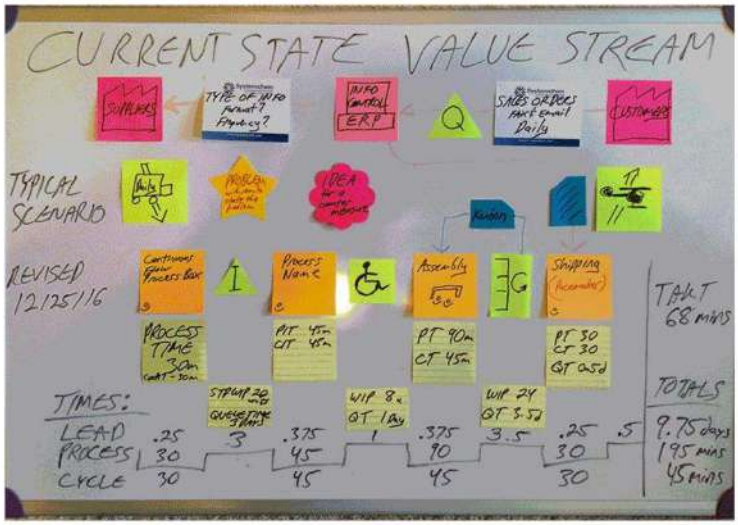
6.2.03.1 *Analyses the supply chain by using value stream mapping*



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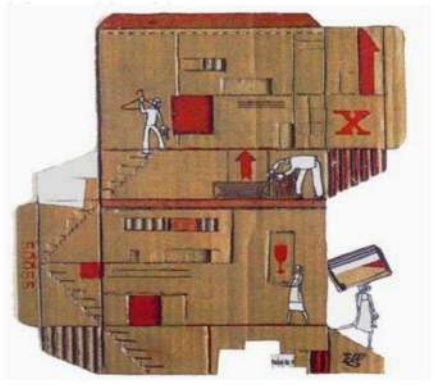
6.2.03.01 Analysis of the supply chain, mapping using the flow value.

A. *The flowchart technique*



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Use of Methods in System Development

- What are the three phases of a system development project?

1 Systems analysis

2 Systems design

3 Systems implementation

7

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Systems Techniques

- What is flowchart?
- A flowchart is a symbolic diagram that shows the flow of data and the sequence of functions in a system.
- Flowcharts are probably the most common system technique.

8

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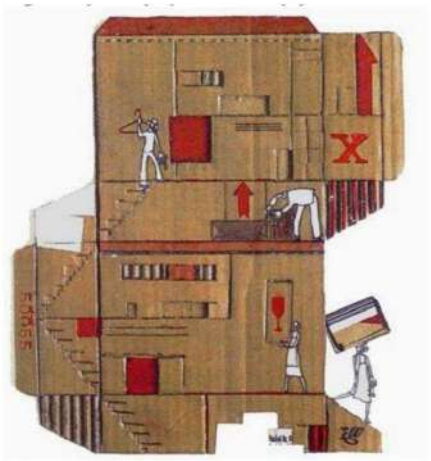
6.2.03.01 Analysis of the supply chain, mapping using the flow value.

B. *Using specific symbols*



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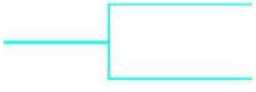
Key Symbols

Input/Output

Process

Flow Bar

Comment



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Specialized Input / Output Symbols

Perforated Card 

Perforated Tape 

On-Line Save 

Magnetic Tape 

Magnetic Disk 

11

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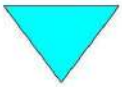
Specialized Input / Output Symbols

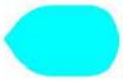
Document 

Communication 

Link

Manual Input 

Off-Line Storage 

Display 

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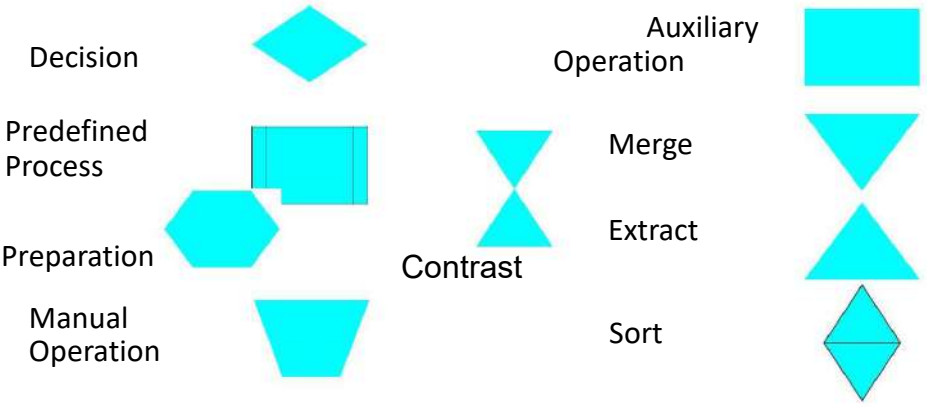
Specialized Process Symbols



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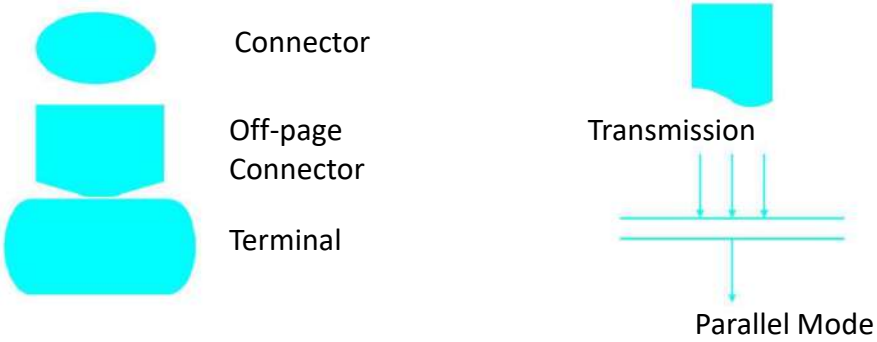
Supplementary Symbols



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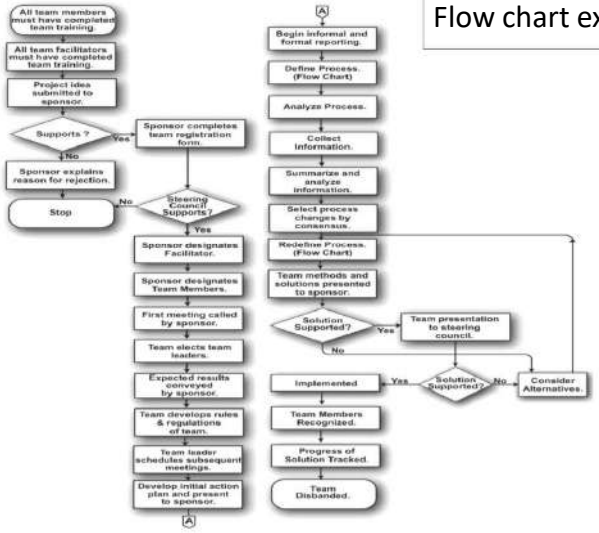
Flow chart example



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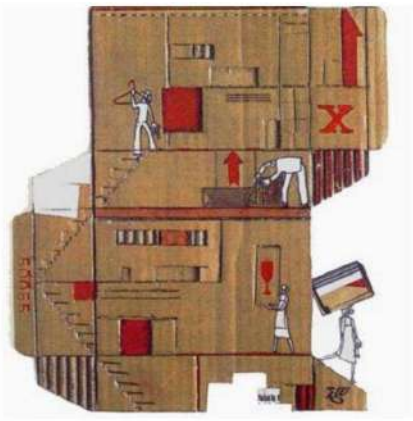
6.2.03.01 Analysis of the supply chain, mapping using the flow value.

Γ. *Imagine a product/workflows through the processing steps*



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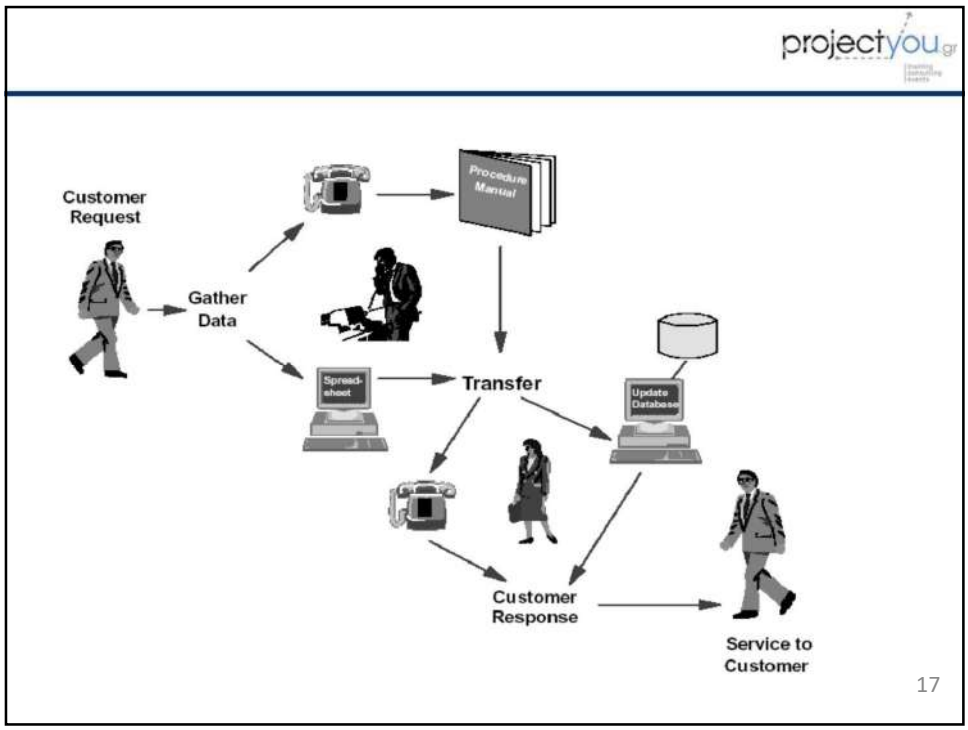
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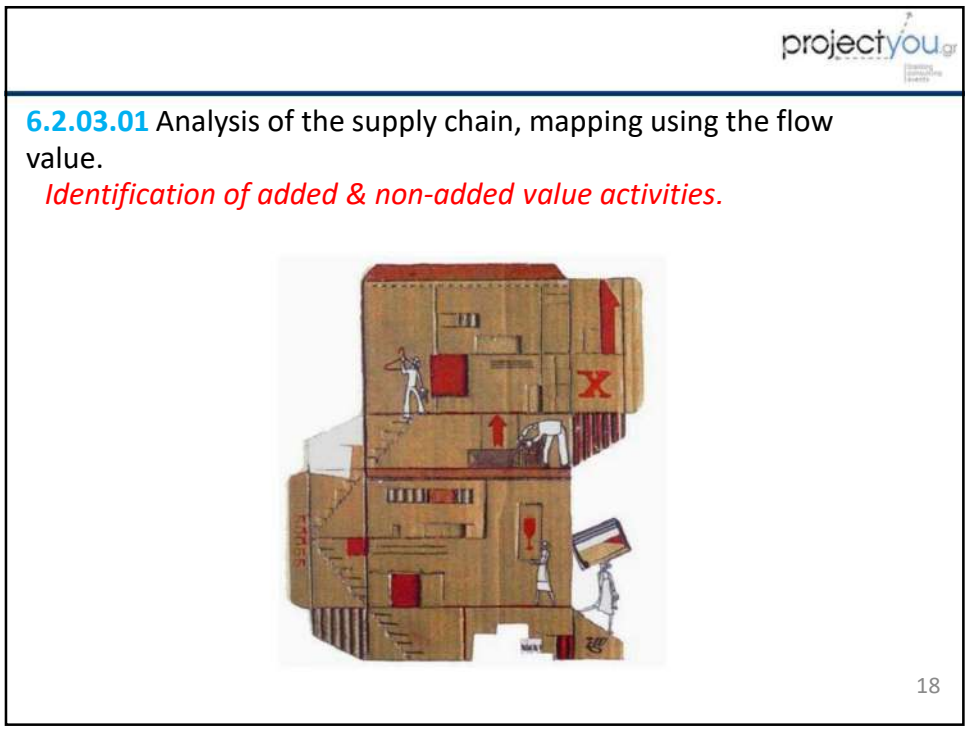
Customer Request
Gather Data
Procedure Manual
Spread-sheet
Transfer
Update Database
Customer Response
Service to Customer
17

17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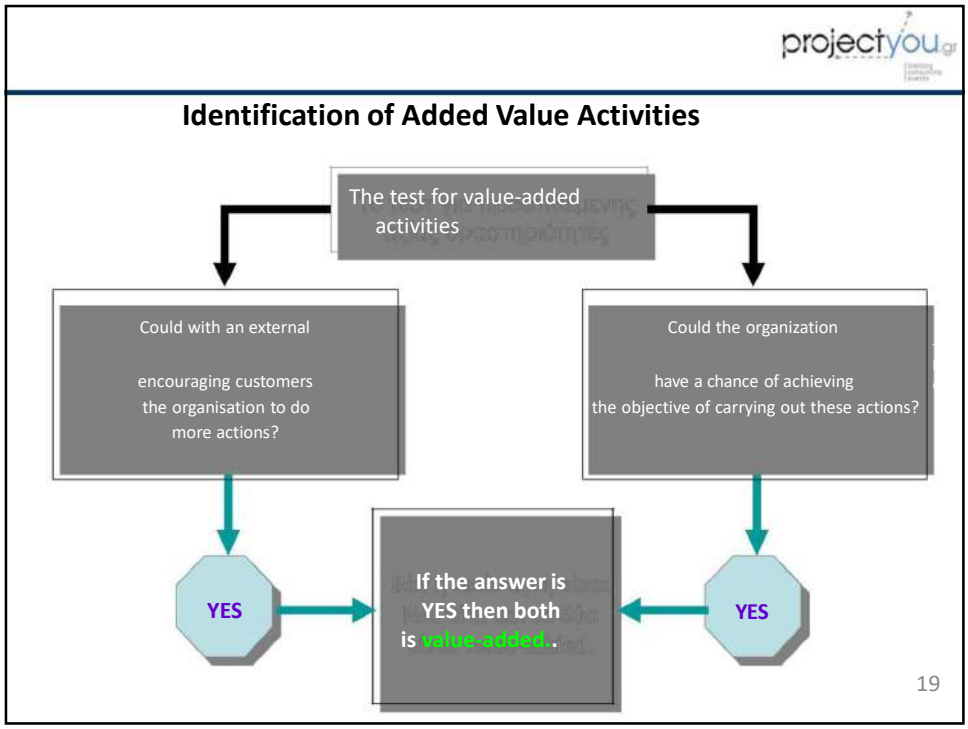
6.2.03.01 Analysis of the supply chain, mapping using the flow value.
Identification of added & non-added value activities.
X
18

18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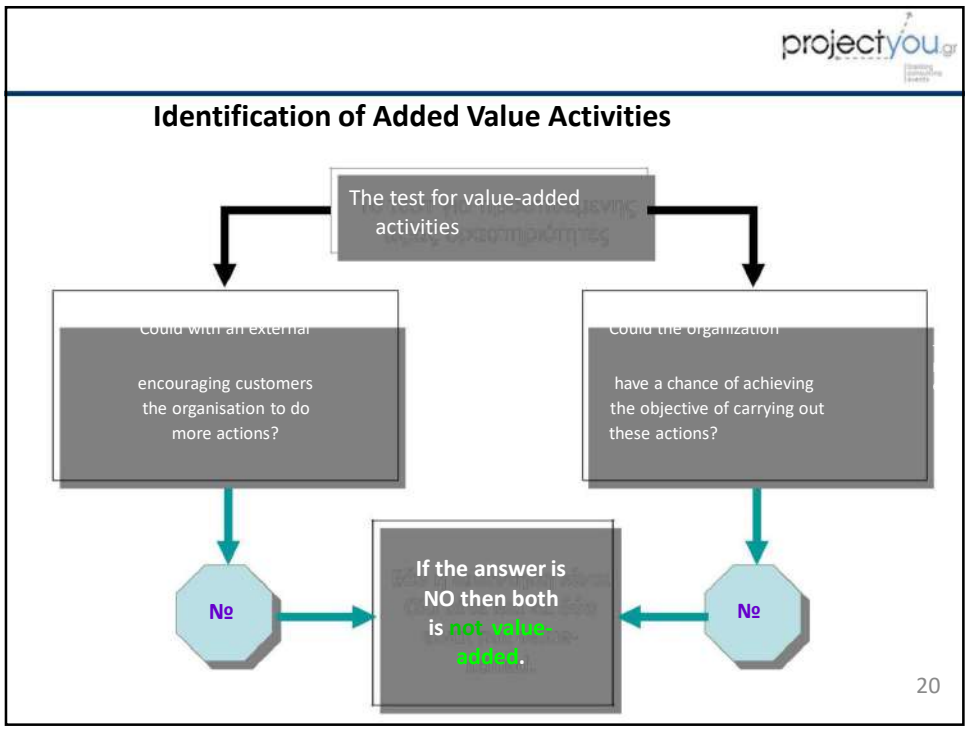
Identification of Added Value Activities
The test for value-added activities
Could with an external
encouraging customers the organisation to do more actions?
Could the organization
have a chance of achieving the objective of carrying out these actions?
YES
YES
If the answer is YES then both is value-added.
19

19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Identification of Added Value Activities
The test for value-added activities
encouraging customers the organisation to do more actions?
have a chance of achieving the objective of carrying out these actions?
№
№
If the answer is NO then both is not value-added.
20

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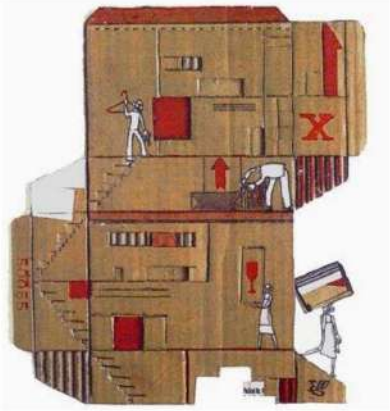
6.2.03.01 Analysis of the supply chain, mapping using the flow value.

E. Identifying opportunities for improvement (Kaizen Burst)

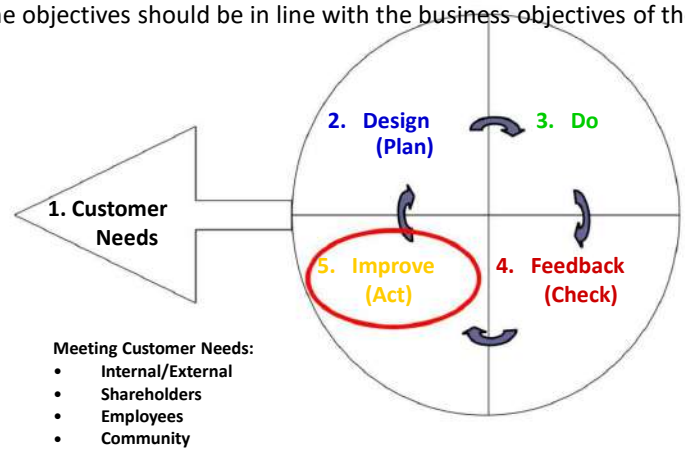


21

21

What is Kaizen?

Kaizen
- is a tool for rapidly improving work as part of the cycle.
- is a tool for applying Rule 4 of Rules-In-Use
- the objectives should be in line with the business objectives of the

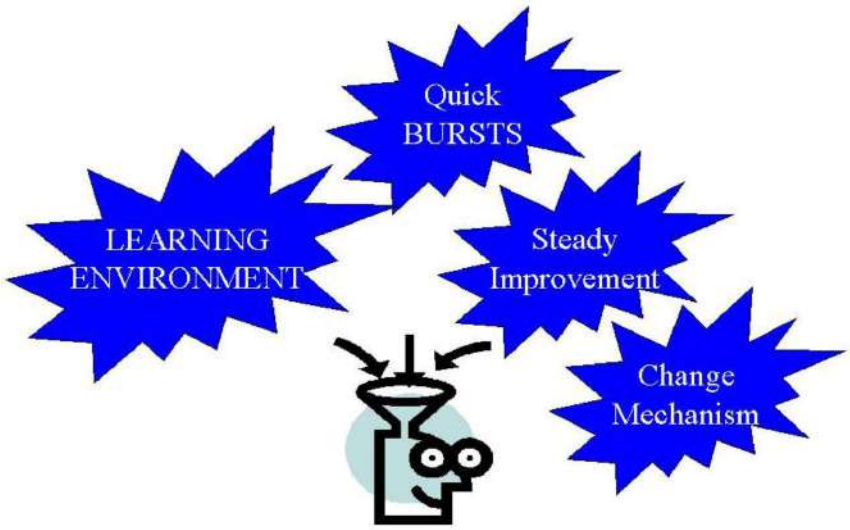


Meeting Customer Needs:
- **Internal/External**
- **Shareholders**
- **Employees**
- **Community**

22

22

Why Kaizen?



23

23

Design & Preparation

There are 5 basic steps:

1. Specifies the business case.
2. Setting targets.
3. Choosing the team.
4. Collecting the data.
5. Plans to support The Kaizen activity.

24

24

The stages of Kaizen

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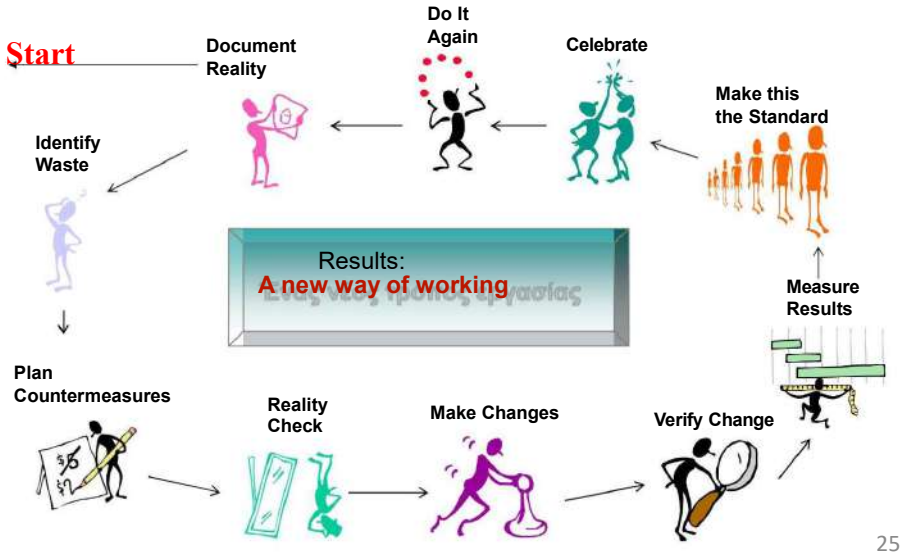
Kaizen's Standard Elements are :



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6.2.03.02 Understanding what is needed to implement a Lean and a flexible supply chain

A. *Focus on customer needs*

26

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Example : Suppose you develop an incubator for babies in third world countries .

List how many stakeholders may be identified.

27

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The book sets out a six-stage process for collecting the needs of interested parties.

1. Specify the scope
2. Raw Data Gathering
3. Interpret Raw Data
4. Organize needs
5. Establishing importance
6. Reflection in the Process

28

28

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Examples:

29

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Actual Example : Book Bag Design

30

30

6.2.03.02 Understanding what is needed to implement a Lean and a flexible supply chain

B. *Keep inventory undifferentiated for as long as possible*

31

31

The steps to build Lean Supply Chains

1. Develop the system perspective
2. Understand customer requirements
3. Mapping the supply chain
4. Best practices
5. Product Design & Procedures to Address Demand
6. Create flows in the supply chain
7. Development of supply chain metrics

32

32

Development of systems with prospects!!

For whatever decision we make we must take into account the following.

- Does it help you sell more products?
- Contributes to the reduction of investment resources?
- Contribute to reducing costs;

33

33

Manage Variance of Demand

- As far as possible, avoid the use of stocks as a regulatory agent

Lean supply chain principle

We manage demand fluctuation with capacity and not with inventories

34

34

6.2.03.02 Understanding what is needed to implement a Lean and a flexible supply chain

Manage Variance of Demand : As far as possible, avoid the use of stocks as a regulatory agent

Lean supply chain principle

We manage demand fluctuation with capacity and not with inventories

35

35

Buffer Inventory

Inventory Buffer is the amount of buffer that must be created to cover random fluctuations in demand or usage, based on the required level of service.

- Accuracy in prediction
- The goal of the service level
- The frequency of refueling
- Time Tolerance
- Seasonality

36

36

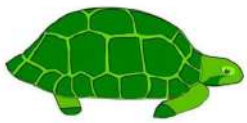
Control of slow-moving items

Features : -

1. Periods with zero demand
2. Average demand per period is relatively low

Problems: -

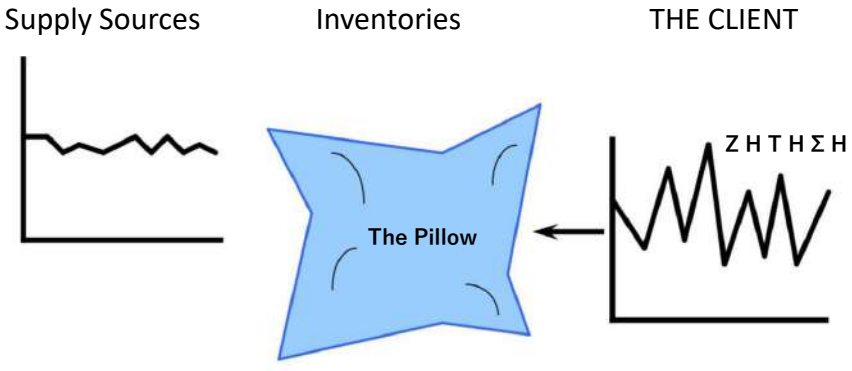
1. Sales or demand model cannot be accessed with a "normal probability distribution", the calculation of security stocks cannot be based on standard deviation!
2. Sufficient data to predict from exponential smoothing or moving average of technical



37

37

THE ROLE OF STOCKS IN TRANSFER



We disconnect stocks from successive operations in the supply chain and reduce acceleration

38

38

Order Management

Key *cost*

- Order Cost
- The Cost of Set-up
- The Cost of Maintaining Stocks
- The Cost of Stockout

39

39

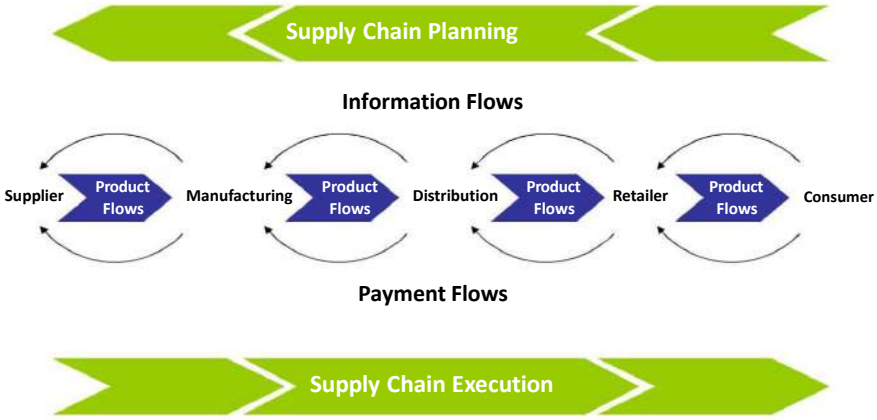
6.2.03.02 Understanding what is needed to implement a Lean and a flexible supply chain

C. Use the predictions in your plan, press to enforce.

40

40

A view of the Supply Chain process



SCM is the coordination of materials, information and financial flows, between all participating undertakings

41

41

Pull vs. Push models in the Supply Chain

1. Consumer needs combined with the business model impose the fundamental shift from a traditional push build-to-stock model to pull a build-to-order model
   - The pull concept is both simple and exciting
   - The customer is the force that drives us!!
     - The Pull model has the following advantages:
       1. Supports increased volatility (products – variants thereof)
       2. Reduced delivery times
       3. Improves quality and lowers unit costs
       4. Functional excellence
       5. Taking comprehensive performance measures and control mechanisms

42

42

6.2.03.02 Understanding what is needed to implement a Lean and a flexible supply chain

D. Create partnerships and alliances with supply chain members.

43

43

Choosing the right relationships

- *Key Topics*

1 What kind of relationships can you observe in the Supply Chain?

2 How can each type of relationship be adapted to different types product?

44

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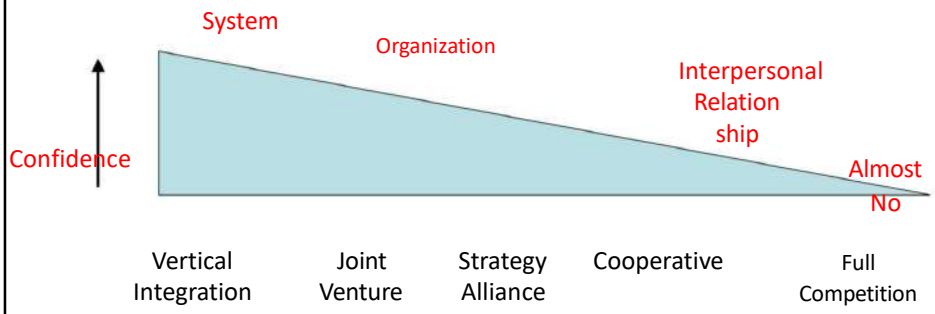
Choosing the right relationship



Relationship forms

45

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Implementation of partnerships

- **Obstacles to building partnerships**

– Power
– Personal interest
– Focusing on the negative impact of partnerships
– Opportunist
– Focusing on price

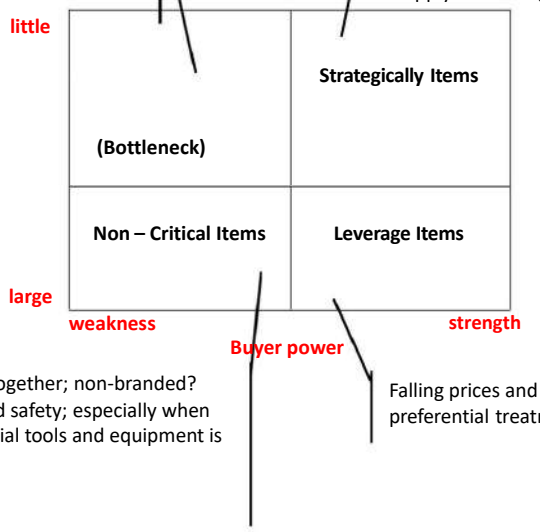
46

46

Choosing the right relationship

Reducing dependence on these elements through diversification of suppliers and substitutes

Using power carefully, to design with suppliers a relationship that ensures supply in the long run



It was not developed together; non-branded? affect performance and safety; especially when low investment in special tools and equipment is required.

Falling prices and pressure for preferential treatment

47

47

6.2.03.02 Understanding what is needed to implement a Lean and a flexible supply chain

E. Capture performance measurement to support process orientation.

48

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Performance Measurement

Regular and systematic collection, analysis and reporting of data monitoring the resources used for the project produced, and whether concrete results have been achieved.

Note: Measurements only make sense to the extent that they form the basis for strategic and operational decision-making

49

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Performance measurement

The performance measurement shall:

1. Based on the objectives of the program and the objectives linking the mission of the program or purpose.
2. Measuring the results
3. Provide comparative data on resource allocation over time
4. Measuring efficiency and effectiveness for continuous improvement
5. They are verifiable, understandable, and valid

50

50

6.2.03.02 Understanding what is needed to implement a Lean and a flexible supply chain

F. *Focus on obstacles.*

51

51

Bottlenecks

1. Add resources to the bottleneck of the operation.
2. Always have a framework for bottleneck processing.
3. Make sure congestion only works on parts of the quality.
4. Review your production schedule
5. Increase the operating time of Operation.
6. Minimize downtime.
7. Perform the process improvement at the bottleneck.
8. Reset some of the congestion work

52

52

6.2.03.02 Understanding what is needed to implement a Lean and a flexible supply chain

G. *Focus on Flow synchronization.*

53

53

Synchronization Specifications, main categories

The Interval based on:

- Time horizon in the relationships between the presentation of objects

The axis based on:

– Presentation of objects that coincide with the axes

Flow control based on:

– Control synchronized flows at specific points

Fact based on:

– Events that trigger actions

54

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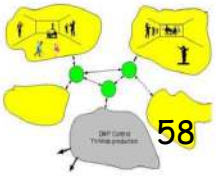
Sync in a distributed environment

- More complex than a classic environment
  - Distributed storage resources
  - Distributed synchronization information storage
  - Delay of communication and variation of delay
  - Communication standards



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6.2.03.02 Understanding what is needed to implement a Lean and a flexible supply chain

H.*Decrease in system variance.*

56

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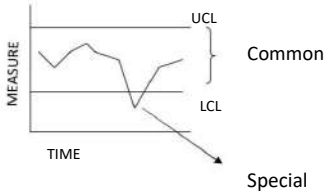
Understanding Variance

"If I had to reduce my message for management to just a few words, I'd say it all had to do with reducing variation."

W. Edwards Deming

Common Causes - Causes of variance that are inherent in the process hour by hour, day by day, and affect every occurrence of the process.

Special Causes - Causes that do not occur or do not affect continuity but arise due to special circumstances.



Tampering - Reacting to an isolated incident.

57

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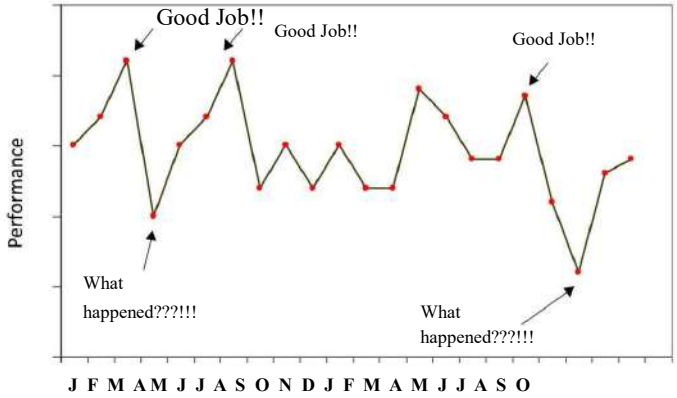
Variance Management Reactions



58

58

6.2.03.03 Applied problem-solving techniques

A. *Process.*

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59

59

A. Steps to solve a problem

Systematic approach

Six steps

1. Define the problem
2. Analyze the problem
3. Create possible solutions
4. Choose the best possible solution
5. Design the application of the
6. Apply and evaluate the solution

60

60

1. Step One : Define The Problem

- Identify the problem
- Develop an accurate problem statement:

Too general or misleading:

- - Too broad. . . "Reduce the quality problems in our area".
- - Implies a cause or suggests a solution . . . "There are not enough forklifts to service the assembly line".

Accurate and Appropriate:

"Reduce the downtime of the assembly line due to parts problems caused by inadequate restocking".

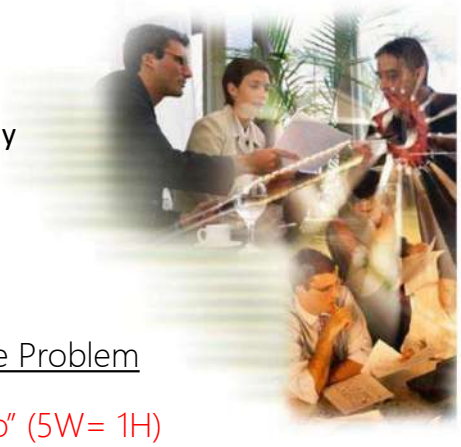
61

61

2.Step Two : Analyze The Problem

2. Don't rush to a wrong solution.
3. Highly critical step.
4. Common mistake to immediately begin generating solutions.

- Must identify and eliminate root causes of problem.



Getting to the Root Cause of the Problem

Five "Whys" equal one "How-To" (5W= 1H)

62

62

3. Step Three : Generate Alternative Solutions

How to Develop Alternatives:

- **Look at the data. What does it tell you?**
  - - Data will lead to some ideas
  - - Data may not lead to best idea
- **Question each aspect of situation.**
  - - What is the job to be done?
  - - Why is the job to be done?
  - - Who should do the job?
  - - Where should the job be done?
  - - When should the job be done?
  - - How should the job be done?
- **Use all idea sources available.**
  - - The worker involved.
  -- In-house experts
  -- Written material
  - - Outside experts

63

63

4. Step Four : Select A Solution

- **Refer back to original problem statement. Consider:**
  - **Safety**
  - **Cost**
  - **Product performance**
  - **Better management information**
  - **Improved Technology**
  - **Time**
  - **Quality**
  - **Appearance**

64

64

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5. Step Five : Plan and Implement Solution

- **Steps to ensure successful implementation:**

- - Work the most powerful forces

- - Prepare an action plan:

... What will be done?

... How will it be done?

... Where will it be done?

... Who will do it?

... When will it be done? - - Develop a tracking system:

65

... Identify milestones or events

... Assign completion dates

... Identify reporting systems

- - Design evaluation procedures

- - Implement the procedures

66

66

6. Step Six : Evaluate The Solution

- Measure results using procedures established during implementation
- Use data gathering:
  - - check sheets
  - - control charts
  - - time studies
  - - Pareto analysis

67

67

6.2.03.03 Applied problem-solving techniques

B. *Tools & Techniques.*

68

68

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1. Flow Diagrams

- **What is a "Flow Diagram"?**
  - **- A graphic representation of a process: May be...**
    - **a physical product**
    - **a service**
    - **information**
    - **or combination of the three.**
- **A Flow Diagram examines the logic or lack of logic in a sequence of steps.**
- **A Flow Diagram gives team members a better understanding of the process.**

69

69

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2. Brainstorming

1. Voting and Ranking Techniques

Brainstorming and Cause/Effect analysis generate a large number of problem, ideas and alternatives.

Techniques are needed to rank them in order of priority.

2. 5-3-1 Ranking Method

- **Each item assigned a value of 5, 3, 1, or 0 by each team member.**
- **Sum of values assigned by team members represents team ranking of that item.**

70

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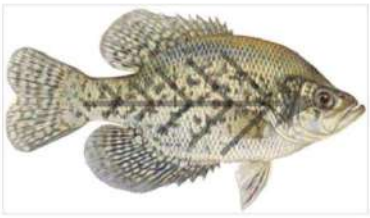
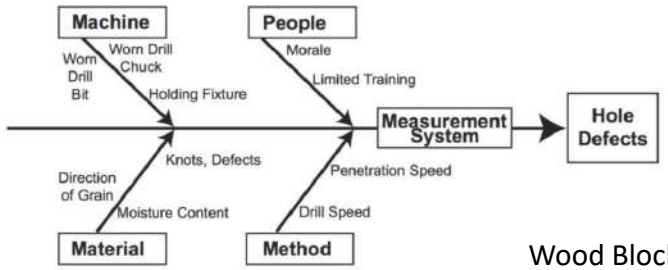
3. Fishbone Diagram





Wood Blocks

71

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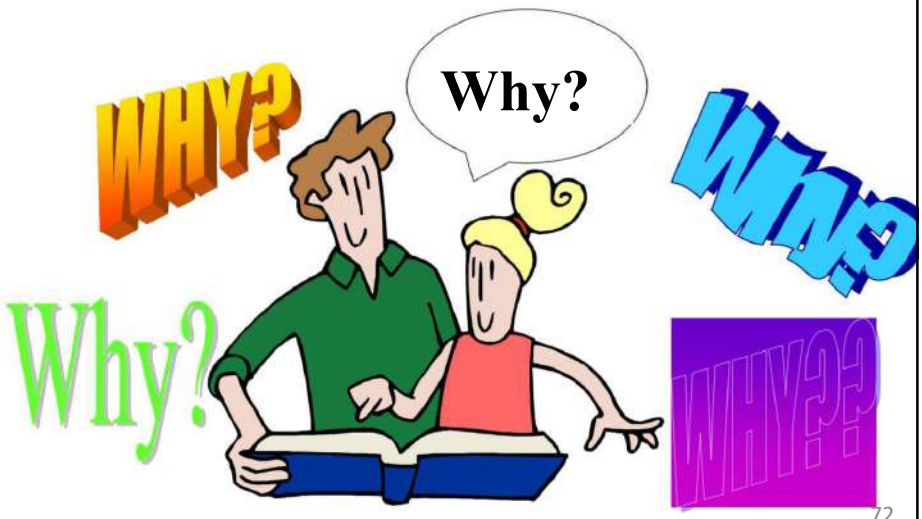
4. 5 Whys: Relentless Root Cause



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Example Problem: Flat tire in garage

1. ***Why?*** Nails on garage floor
2. ***Why?*** Box on shelf split
3. ***Why?*** Box got wet
4. ***Why?*** Rain through hole in garage roof
5. ***Why?*** Rain happens *

***can't control so go back to previous why and fix it**

73

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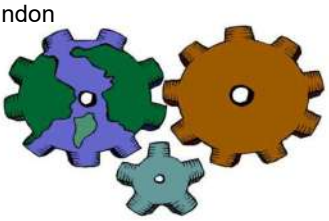
5. Plan-Do-Check-Act Cycle.

Four Phases of PDCA Cycle

- **Plan** a change aimed at improvement
- **Do** – Carry out the change
- **Check**/Study the results
- **Act** - Adopt, adapt, or abandon



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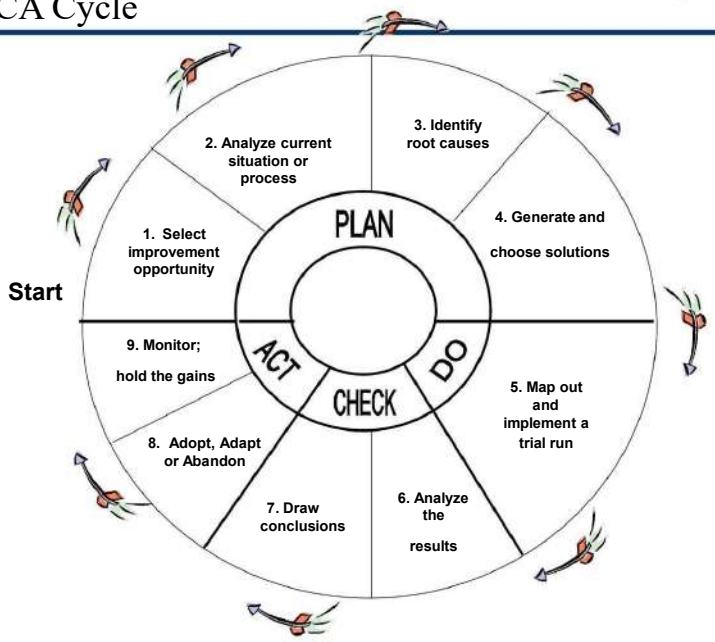
PDCA Cycle



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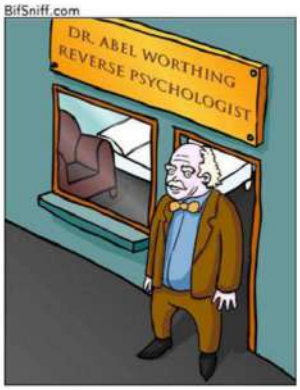
6.2.03.04 Implementation of the Reverse Logistics

A. *Operational Procedures*



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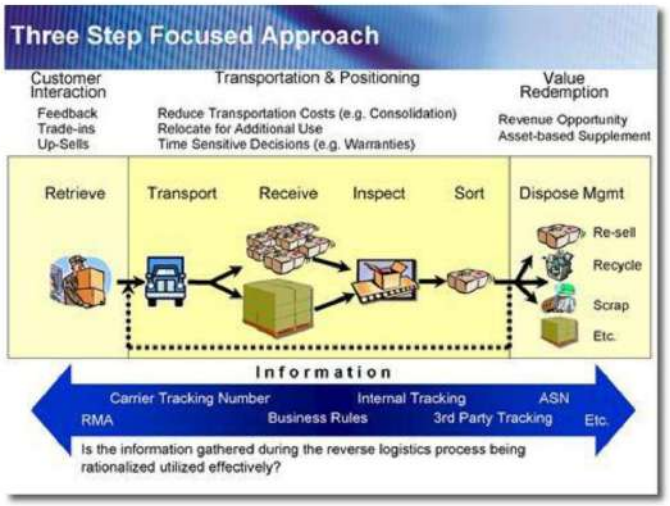
The Reverse Logistics Process



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Strategic exploitation of Reverse Logistics

1. Reverse Logistics a Strategic Weapon

– Many companies have not yet decided to emphasize reverse logistics as a strategic variable.

– Tackling reverse logistics is a strategic possibility.

Reverse logistics strategically used to:

- Reducing the risk of buying products that are not "hot selling".
- Managing the cost of changing suppliers.

Strategic Role of Returns

Role	Percentage
Competitive Reasons	65.2%
Clean Channel	33.4%
Legal Disposal Issues	28.9%
Recapture Value	27.5%
Recover Assets	26.5%
Protect Margin	18.4%

Source: Rogers and Tibben-Lembke, Going Backwards: Reverse Logistics Trends and Practices, 1998

78

78

Return collection process

Collect returns from customer
- give customer return options
- ensure right packaging
- provide transportation labels
- organise transport at the right time

In case from own organisation
- organise transport
- decide on destination return and arrange further transport

79

79

Recovery options

- *Direct reuse* after inspection, cleaning
  e.g. packaging, commercial returns, unused spare parts
- *Remanufacturing:*
  disassembly into parts, which are used in manufacturing of the same or different products or are used as spare parts
- *Recycling*
  for old products in order to recapture material value
- *Disposal* as waste

Decision made on residual value of return (quality and demand)

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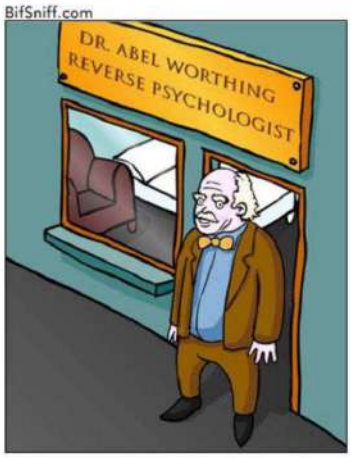
6.2.03.04 Application of Reverse Logistics

B. *Product types.*



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Why return management?

Returns are characterised by
- much uncertainty in timing when they come back,
- much uncertainty in product status, quality
- much uncertainty on administrative aspects (refunds, VAT)
- large variety in handling

However, most management is occupied with optimising the standard forward logistics. Hence they have little time for managing the returns!

As a result millions are lost (Gus Pagonis, Exec VP Sears)

82

82

REASONS FOR RETURNING USED PRODUCTS

- ***End- of-Life Returns.*** These are returns that are taken back from the market to avoid environmental or commercial damage. These used products are often returned as a result of take back laws.
- ***End-of-Use Returns***. These are used products or components that have been returned after customer use. These used products are normally traded on an aftermarket or being remanufactured.
- ***Commercial Returns*****.** These returns are linked to the sales process. Other reasons for the returns include problems with products under warranty, damage during transport or Product recalls.
- ***Re-Usable Components***. These returns are related to consumption, use or distribution of the main product. The common characteristic is that they are not part of the product itself, but contain and/or carry the actual product; an example for this kind of return is remanufactured toner cartridges [14].[83]

83

6.2.03.05 Understand the elements of a cost model:

Cost- To - Serve

84

84

Factors that Affect Cost to Serve

Cost To Serve Concepts

Cost To Serve is: Understanding the total cost of servicing our customers ….at a customer and product level ….so that the business can provide appropriate ….levels of service to its customers ….to achieve business goals

Cost To Serve is NOT: –Activity Based Costing

85

85

Cost to Serve outcomes

Typical Cost to Serve outcomes include:

– *Identification of low margin customers*
– *Identification of low margin products*
– *Identification of high cost processes*

Ultimately…..making all customers profitable, or more profitable!

86

86

What are direct and indirect costs?

- **Direct costs** are costs that can easily be traced to a specific project or activity.
- **Indirect costs** are costs that can *not* be easily traced to a specific project or activity.

87

87

Let's practice!

Determine if the following are direct or indirect costs:

1. Assembly line worker — Direct
2. Manager of a paper company — Indirect
3. Electricity — Indirect
4. Alarm sales rep — Direct
5. Chef for a gourmet dinner — Indirect
6. Office space — Indirect
7. Microscope for a chemist — Direct
8. Postage for a FedEx package — Direct

88

88

6.2.03.06 Identify and implement Key Performance Indicators (KPIs) in the Supply Chain.

89

GET CLARITY – KNOW WHAT YOU WANT

Use KPI To Create

1. Accountability
2. Establish Action Plans
3. Measure Progress

90

What are Key Performance Indicators (KPIs)?

Price	Delivery	Quality
Total product cost	Performance to schedule	Product reliability and consistency

KPIs are measurements of a supplier or service provider's performance in key activity areas

91

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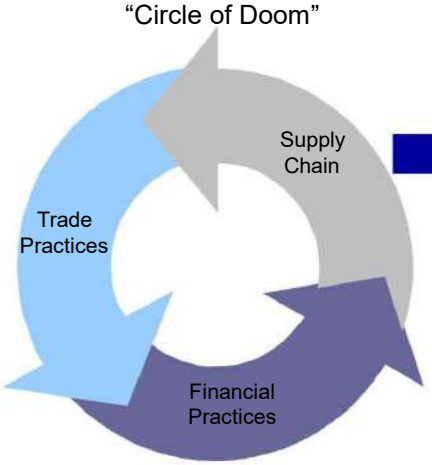
History of KPIs

Jim Kilts'
"Circle of Doom"



Centralize procurement

Implement Strategic Sourcing (SSI)

KPIs sustain strategic sourcing savings

92

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SCM Performance Measures

- Process-based measures- SCOR model
- Functional- based measures- activities/departments assessed
- QCDF measures- performance across boundaries of suppliers and customers
- Total chain measures- or 'supply chain barometer' assessing performance of complete SC and across organizational boundaries
- All these above are not mutually exclusive but different from the way they are viewed

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1. Process-based Measures

- Forecasting & Demand Management- forecasting accuracy, planning efficiency, standardization index
- Procurement & Supplier Management- vendor ratings, RM inventory turns, WIP, material stock-outs
- Order Processing- shipment accuracy, order processing time, invoice documentation completion/accuracy
- Distribution Management- space utilization index, logistics assets turnover, container utilization, warehouse picking time

94

94

2. QCDF measures

QUALITY	COST
-Raw material quality	-Material cost
-Product quality	-Labor cost
-Order entry accuracy	-Overhead costs
-Warehouse picking accuracy	-Storage costs -Logistics costs
DELIVERY	**FLEXIBILITY**
-Order processing time	-RM inventory days
-Manufacturing lead time	-FG inventory days
-Procurement lead time	-GIT inventory days
-Shipment time	-Distributors inventory days
-Warehousing picking time	

95

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Total SCM Measures

- Total SCM costs- cost of all SCM functions as % of gross sales covering managing of material, information and fund flows(cost focus)
- Delivery performance to customer request-% orders fulfilled on or before required (customer focus)
- Cash to cash cycle time- number of days between paying for raws and receiving from customer(inventory/working capital focus)
- Value added productivity per employee- =(sales –cost of goods sold)/ number of employees(management efficiency focus)
- Upside production flexibility- days required to meet + 20% unplanned demand on sustained basis(SC flexibility focus)

96

96

6.2.03.07 The application of Lean techniques to identify opportunities to improve the process.

97

97

Six Sigma Concept

- http://www.youtube.com/watch?v=LNtEW4DVRkE&feature=related
- Introduced by Motorola in the mid-1980's
- Purpose: to improve the performance process to where defects rate was 3.4 per million or less.
- Designed for high volume production settings.

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Six Sigma: The Name

- From the concept of standard deviation signified by lowercase Greek letter sigma: σ
- Processes and outputs typically measure in their standard deviations from the mean (ideal point).

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Six Sigma and Total Quality

- Six Sigma is an extension of Total Quality.
- Six Sigma is a total quality strategy, like all others, to achieve: superior performance, that is continually improved, forever.
- Six Sigma is achieved by improving process performance.

100

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Lean Operations

- Lean=Lean Manufacturing=Lean Operations
- Lean: originally a manufacturing concept thus lean manufacturing.
- Lean Operations: because it is found to produce good results in both manufacturing **AND** service sectors.

101

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Lean Focuses on Waste

- Overproduction Waste
- Inventory Waste
- Motion Waste
- Transportation Waste
- Over-processing Waste
- Defects Waste
- Waiting Waste
- Underutilization Waste

102

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DMAIC Roadmap

- The Nucleus of Six Sigma: Define, Measure, Analyze, Improve, and Control.
- Five Phases are constant
- Steps, tools and outputs of each phase may vary somewhat.

103

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Define

- 1. initiate the project
- 2. Define the process
- 3. Determine Customer requirements
- 4. define key process output variables

- Possible tools: value stream maps, affinity diagrams, brainstorming, surveys

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Measure

- 1. Understand the process
- 2. Evaluate risks on process inputs
- 3. Develop and evaluate measurements systems
- 4. measure current performance
- Results: Knowing your starting point, verification of measurement systems, current capabilities

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Analyze

- 1. Analyze data to prioritize key input variables
- 2. Identify waste
- Results: root causes reduced. Prioritize potential key inputs, and list specific wastes.
- Tools: Five-S (sort, store, shine, standardize, & sustain)

106

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Improve

- 1. verify critical outputs
- 2. Design Improvements
- 3. Pilot the new process
- Results: an action plan for improvement, future state process maps, control maps, new process design/documentation

107

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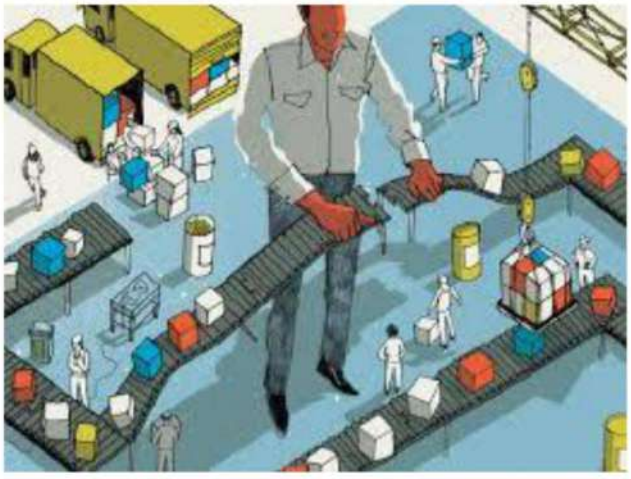
6.2.03.08 Developing models to investigate the impact of options on the supply chain.



108

108

Introduction

- There is a current emphasis of comprehensive assessment of cost for development, procurement and sustainment.
- This requires the balancing of four separate aspects of total system "value".
  - Performance (Coverage)
  - Operational Availability (Ao)/Logistics
  - Reliability (MTBF)
  - Life Cycle Cost (LCC)
- Objectives set in the value equation include
  - Maximize Performance (Coverage)
  - Maximize Operational Availability
    - Optimize the logistics support strategy
  - Minimize Life Cycle Cost
  - Maximize Reliability (MTBF)

109

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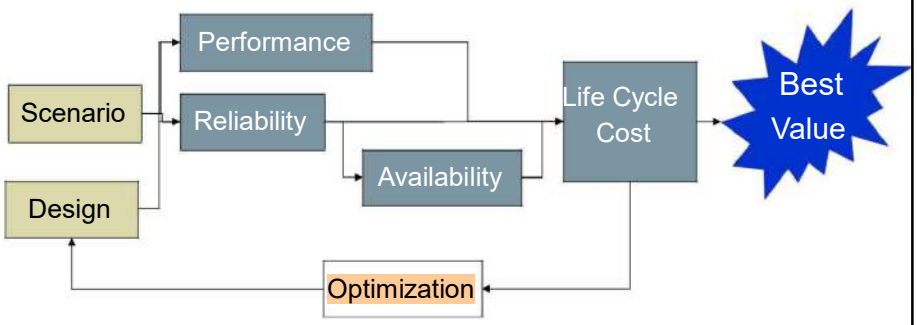
Modeling Approach /Analysis Flow



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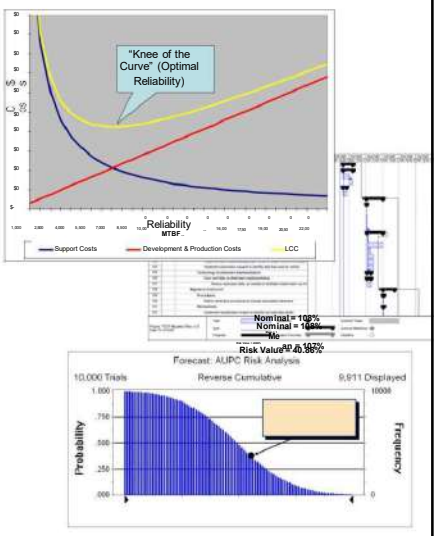
Cost Modeling Uses CAIV

- **Cost As an Independent Variable** (CAIV) balances, cost, schedule, performance, and risk
  - Treats cost as a requirement
  - Early application critical
  - Answers the question: How much performance can I get for my money?
  - Trades performance or effectiveness for reductions in **life cycle cost**



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Forecasting Techniques

- ***Qualitative forecasting*** is based on opinion and intuition.
- ***Quantitative forecasting*** uses mathematical models and historical data to make forecasts.
- ***Time series*** models are the most frequently used among all the forecasting models.

112

112

Forecasting Techniques- Cont .

Components of Time Series- Data should be plotted to detect for the following components:

- **Trend variations:** either increasing or decreasing
- **Cyclical variations:** wavelike movements that are longer than a year
- **Seasonal variations:** show peaks and valleys that repeat over a consistent interval such as hours, days, weeks, months, years, or seasons
- **Random variations:** due to unexpected or unpredictable events

113

113

Logistics Modeling & Analysis

- Logistic support analysis
  - Reliability-centered maintenance (RCM)
  - Failure modes effects (criticality) analysis (FMECA)
  - Reliability and maintainability (R&M) studies
  - Safety analysis
  - Life cycle cost (LCC) analysis
  - Maintenance task analysis (MTA)
  - Level of repair analysis (LORA)
  - Logistics Support Analysis Record (LSAR
- Existing LOGSA Tools are the current focus of DoD Logistics Activities

114

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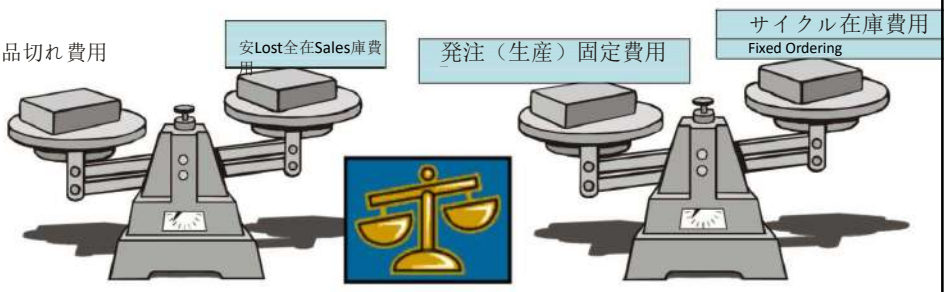
Inventory Policy Optimization

- Decision support in operational/tactical level
- Determine various parameters for inventory control policies



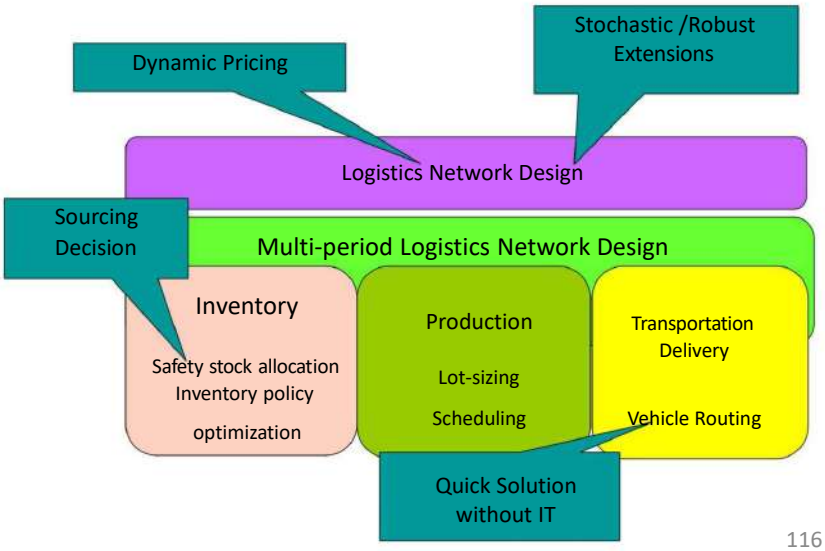
Classical Newsboy Model

Classical Economic Ordering Quantity Model

115

115

Optimization Models for SCRM



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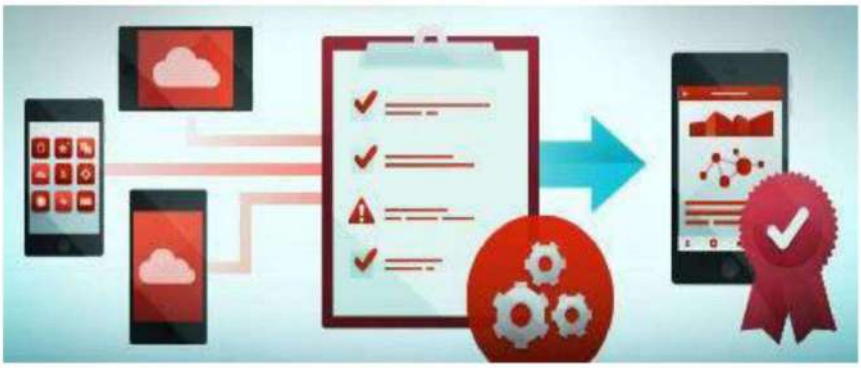
6.2.03.09 Conduct software functionality tests



117

117

Functional Testing

- Testing the functionality according to the specified requirements
- Earlier functional testing can display the sofware maturity level and enable early bug fixing activities
- Functional testing can be done in any software testing level

118

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Maintenance Testing

- Software maintenance is the modification of a software product after delivery to correct faults, to improve performance or other attributes, or to adapt the product to a modified environment. (IEEE 1219)
- The software product undergoes modification to code and associated documentation due to a problem or the need for improvement. The objective is to modify the existing software product while preserving its integrity. ISO/IEC [ISO95]

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Stress Testing

- Testing the system or entity as a perspective of excessive operational capacity
- Determine acceptable system behaviour under heavy load
- Detecting memory leaks, thread deadlocks, unresponsive software entities, data corruption, process anomalies, runtime errors, etc.
- Develop corrective action models in order to mitigate the risks

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Security Testing

- Adopt routine security procedures to be performed for each release/build
- Probe vulnerabilities of the system by using security tools
- Automatic test genaration to simulate specific network attacks

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Usability Testing

- Evaluating product or service by considering the end-user point of view
- A part of system unit may function correctly however, may not provide ease of use
- Focus on the intended groups and increase overall user satisfaction

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Localization Testing

- Testing the customized software product according to targeted software market
- Discovering cultural or grammatical potential failure points
- Ensuring compatibility and functional consistency across all localized software versions
- Determining adaptation level of a software unit for multiple configurations on different locales

123

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Testing Types – Sample Question

Which of these is a functional test?

a) Measuring response time on an airline reservation system
b) Checking the effect of high volumes of traffic in a CRM software
c) Checking the on-line bookings screen information and the database contents against the customer bill information
d) Checking how easy the system is to use

124

124

125

125