

Value Analysis and FAST Diagramming

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Thomas Prentiss
Manager of Xerox Value Analysis and Value Engineering
Xerox Corporation
(585) 422-5961
Thomas.Prentiss@usa.xerox.com

What is Value Analysis?



We are all in the business of solving problems.

We sell products and services to help others solve their problems or satisfy their needs and desires.

We solve our own problems in producing these goods and services in a more effective and efficient manner.

What is Value Analysis?

- Some problem solving methods:
 - Cut and Try
 - Engineering
 - Re-engineering
 - Cost Reduction
 - Cost Down
 - QFD
 - Six Sigma
 - Lean Manufacturing
 - Lean Six Sigma
 - Balanced Scorecard
 - Feynman problem solving algorithm
 - JIT
 - A Delta T
 - Xerox (or fill in your own name) Problem Solving Process
 - Quality Improvement Process
 - Design for Assembly
 - Design for Manufacturing
 - Brainstorming
 - Design for Six Sigma
 - ...

What is Value Analysis?



- Each is a process intended to HELP to arrive at a better solution, more efficiently.
- Most can be mapped to one another and most are just variations on the Scientific Method.
- Each brings with it some common and some unique tools, techniques, ... and consultants.

What is Value Analysis?



Value Analysis is a problem solving methodology which utilizes its own set of specialized tools and techniques to help a team generate optimum solutions to their system's problems.

What is Value Analysis?



- Value Analysis is different because it emphasizes **Function**.
- Value Analysis seeks to maximize the **Value** of a system.

What is Value?



$$\text{Value} = \text{Function} / \text{Cost}$$

where **Function** is WHAT a system does and

Cost is the total cost to implement the function.

Where is Value Analysis applied?

- Value Analysis improves the **VALUE** of any system:
 - **Hardware** - Architecture, total machine, module, subsystem or part
 - **Process** or **Procedure** - Engineering, manufacturing, service, business, ...
 - **Organization** - Any size, any stage
 - **Software** - Concept, design

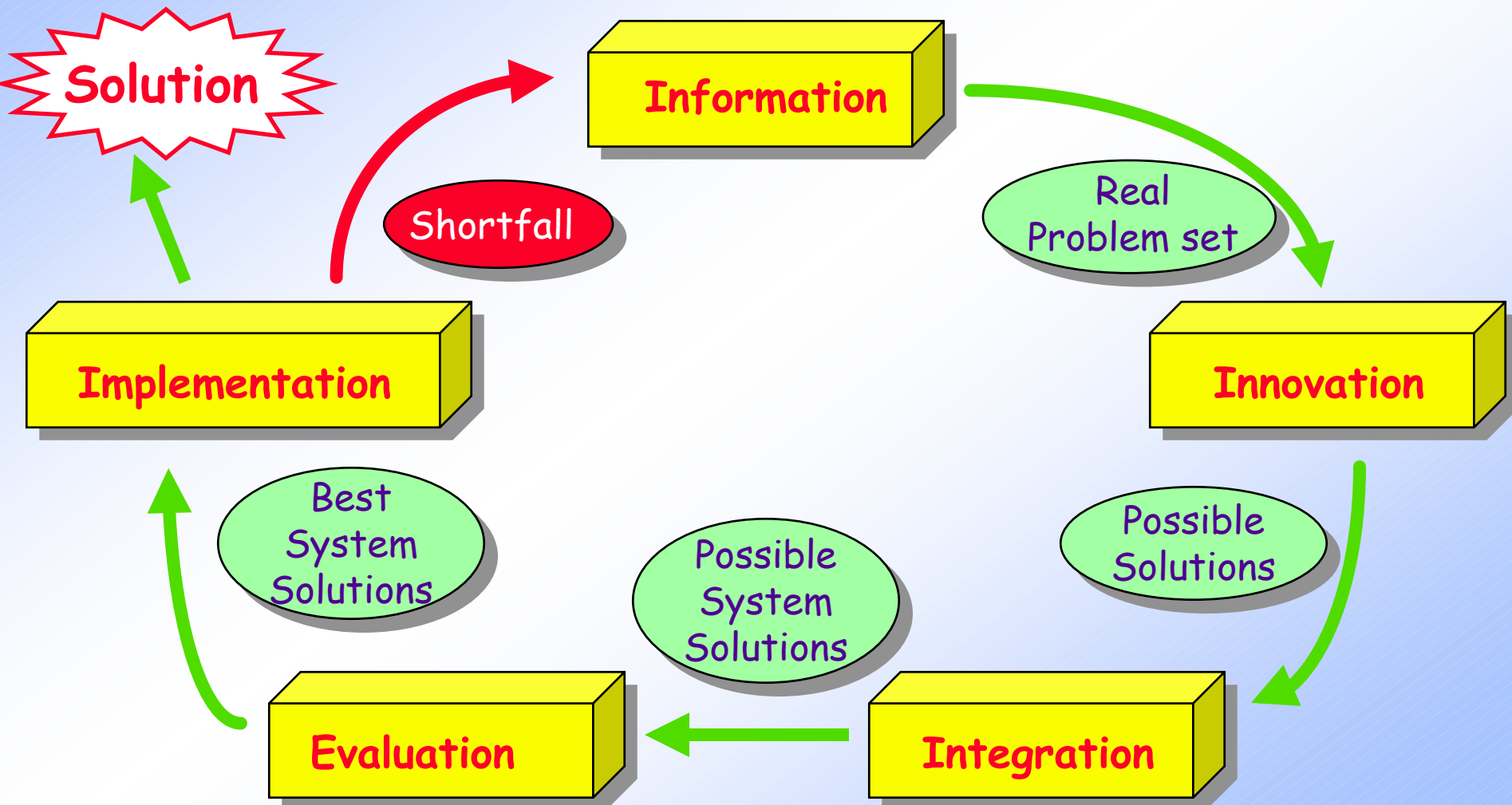
How is Value Analysis applied?



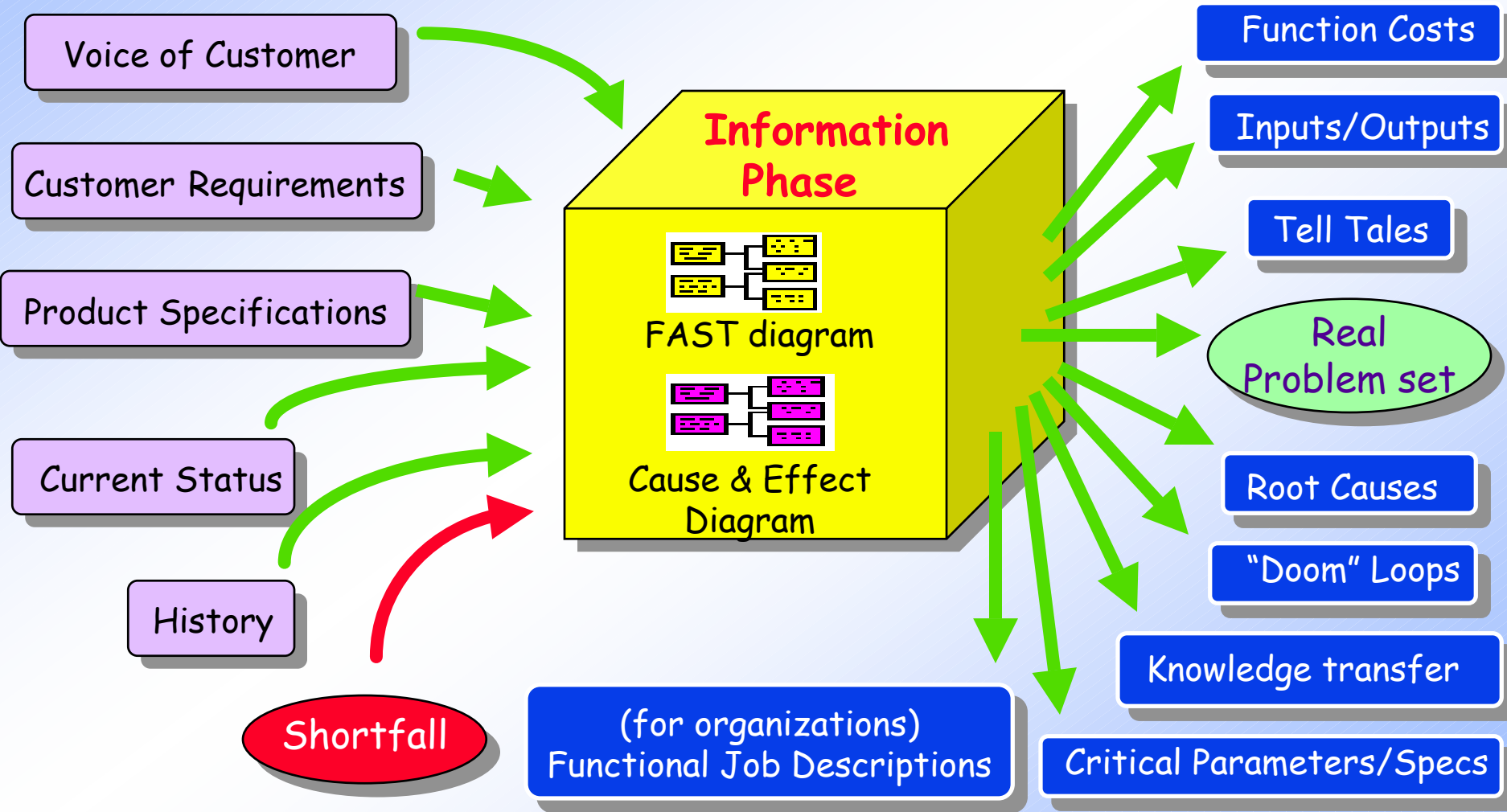
It is not an incremental task, but it is a better way to work

- It provides structure and discipline to normal work functions
- It provides tools/techniques to optimize the team's efforts
- It provides documentation of the team's process and results

The Five Phases of Value Analysis



Information Phase



FAST Diagram



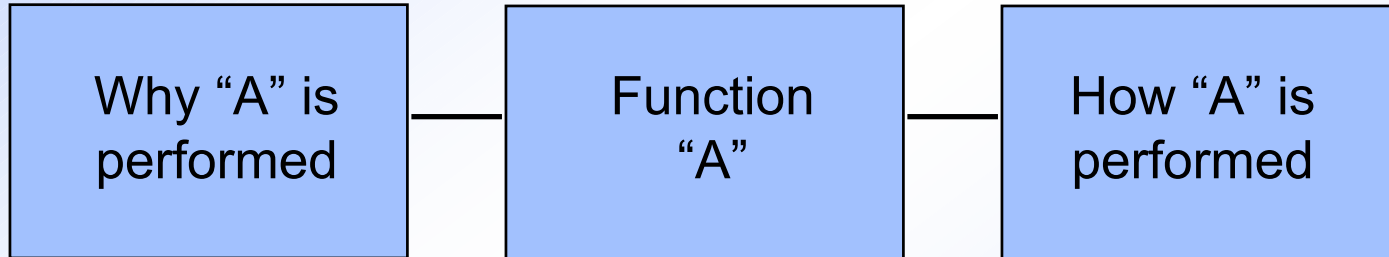
- Developed by Charles W. Bytheway at Sperry Rand Corp in 1964; presented in a paper to the Society of American Value Engineers (SAVE) in 1965.
- Functional Logic diagram
- Shows functional hierarchy, interactions and interdependencies
- Determines functional costs
- Used at Xerox for over 30 years

FAST Diagram



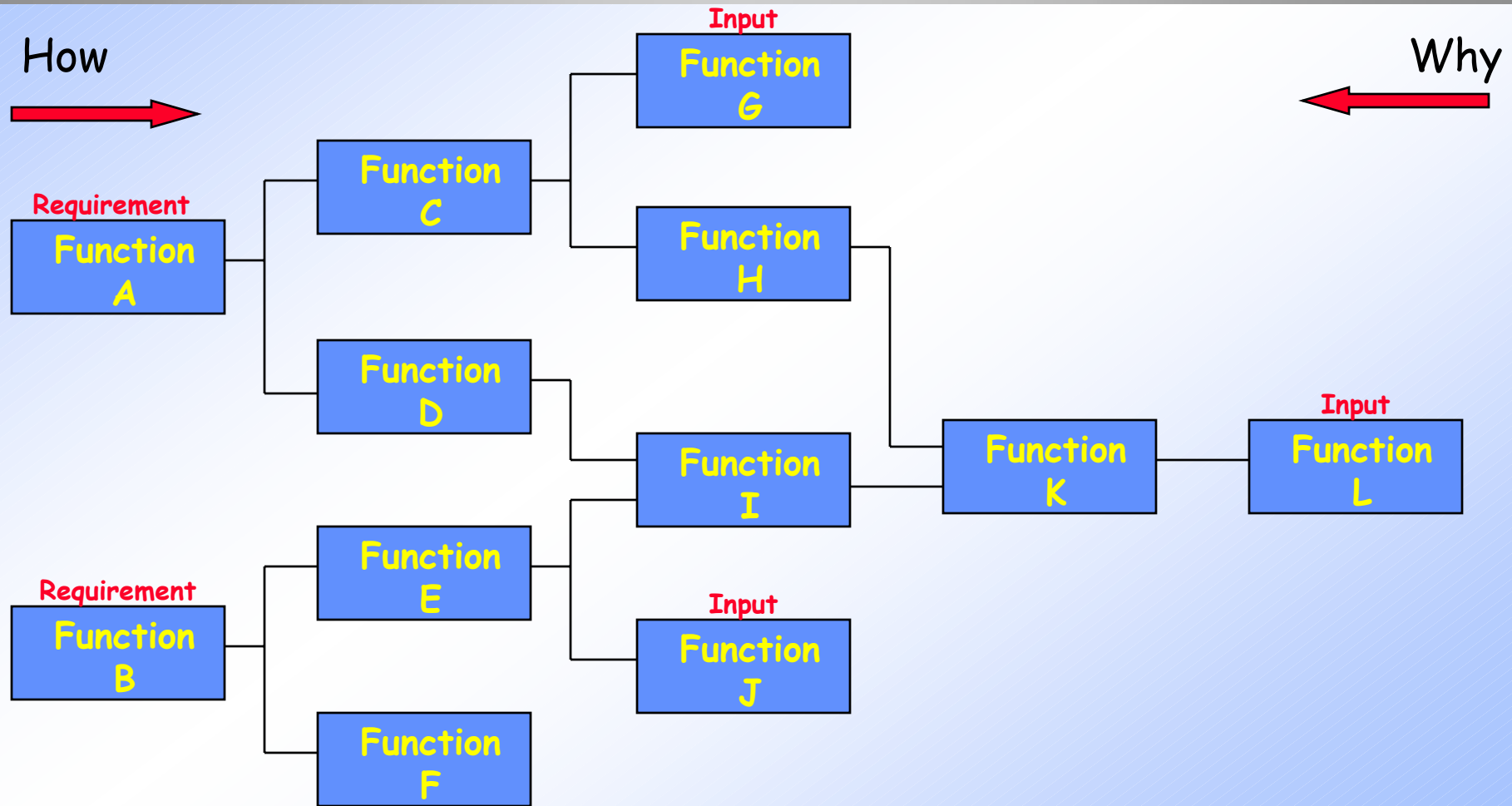
How →

← Why



- Each Box contains a Function Name
 - Action Verb
 - Measurable Noun
- How functions are connected to the right.
- Why functions are connected to the left.

FAST Diagram



FAST Diagram

- High Level Functions
 - Requirements
 - Outputs
 - Identification of interfaces
- Low Level Functions
 - Inputs
 - Identification of interfaces
 - Level of detail
- Matching of expected outputs and inputs with interfaces

Example - Cheap Pen

Steel Retaining Tip



Example - Cheap Pen Assembly Function List



PART/ASSEMBLY

FUNCTION

End Cap

Mount/locate ink cartridge
Enhance aesthetics
Mount/Locate main body
Enable disassembly

Main Body

Identify company
Identify model
Mount/locate retaining tip
Mount/locate clip cap
Mount/locate ink cartridge
Enhance aesthetics
Enhance grip

Example - Cheap Pen Assembly Function List



PART/ASSEMBLY

FUNCTION

Clip Cap

Cover writing point
Retain pen in pocket
Enhance aesthetics
Reduce rolling

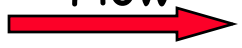
Steel Retaining Tip

Mount/locate ink cartridge
Enhance aesthetics
Enhance life of pen
Enhance perception of quality
Improve balance

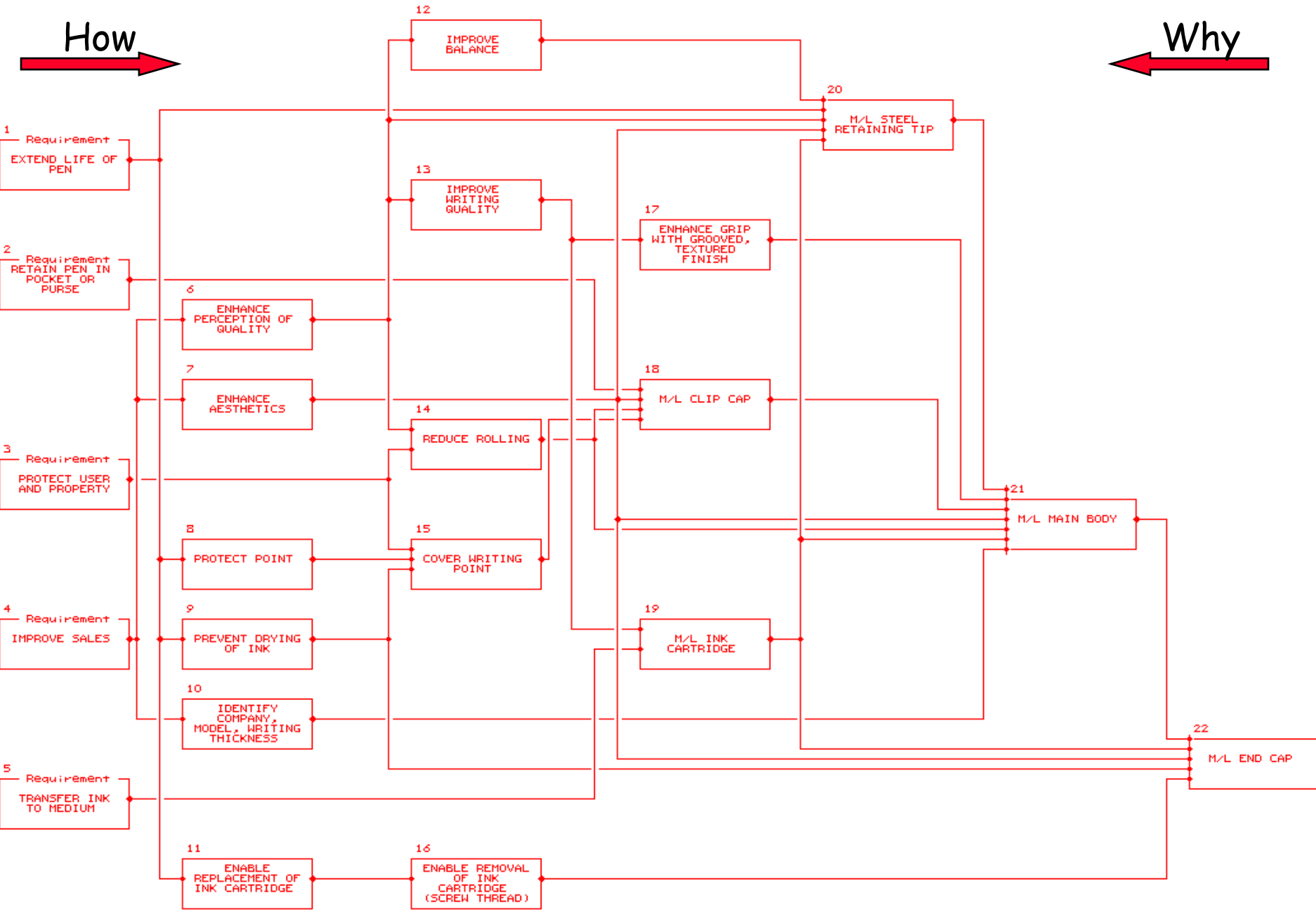
Ink Cartridge

Transfer ink to medium

How



Why



Example - Cheap Pen Function Cost List



Function Cost Allocation List

CHEAP PEN

D:\Program Files\FASTaCE\Cheap Pen.fas Last updated: 9/8/03

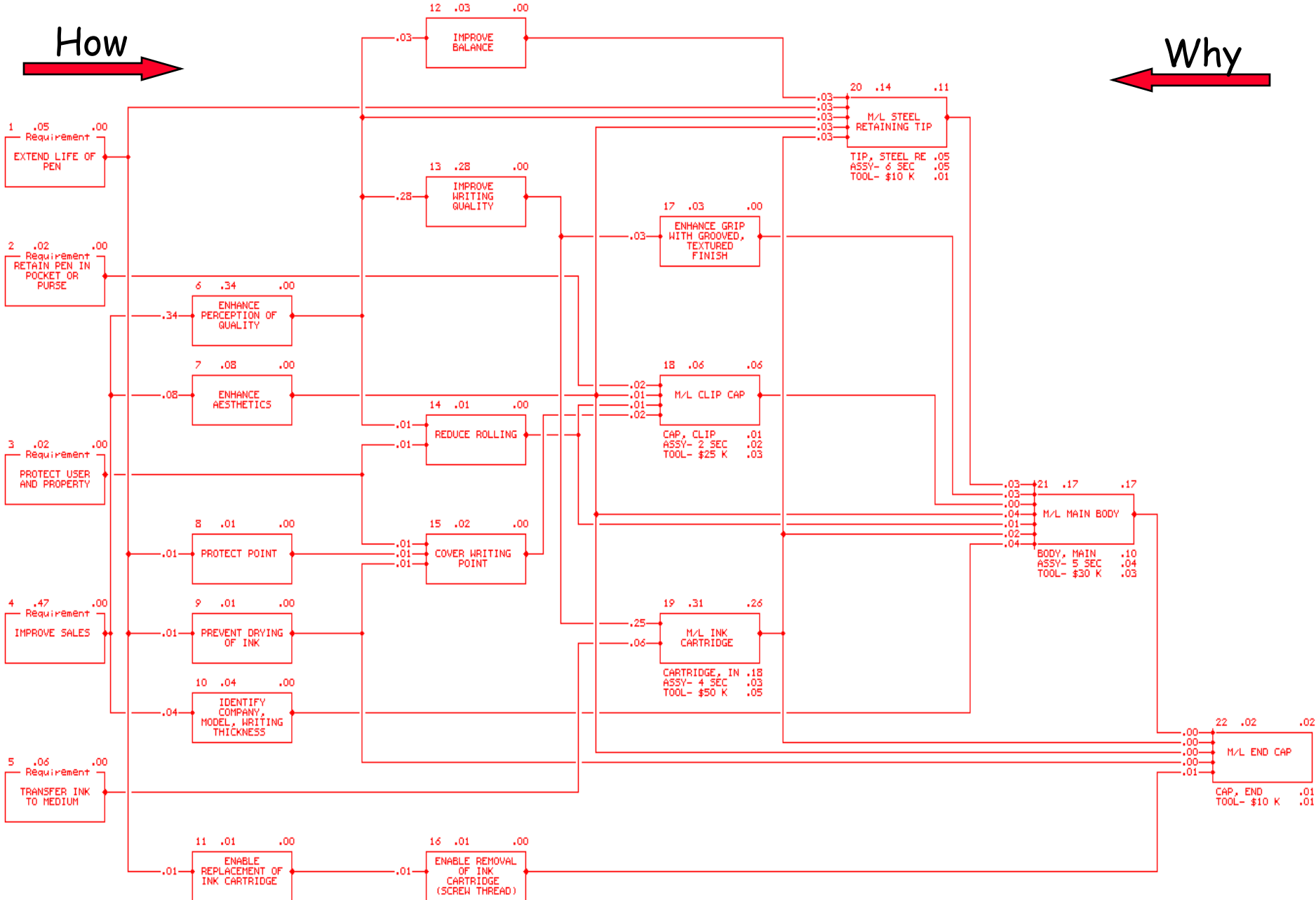
September 9, 2003

Item				Function		
#	Part name	Part Number	Cost	Allocation	#	Name
1	CARTRIDGE, INK		0.18	0.18	19	M/L INK CARTRIDGE
2	ASSY- 4 SEC		0.03	0.03	19	M/L INK CARTRIDGE
3	TOOL- \$50 K		0.05	0.05	19	M/L INK CARTRIDGE
4	TIP, STEEL RETAINING		0.05	0.05	20	M/L STEEL RETAINING TIP
5	ASSY- 6 SEC		0.05	0.05	20	M/L STEEL RETAINING TIP
6	TOOL- \$10 K		0.01	0.01	20	M/L STEEL RETAINING TIP
7	CAP, CLIP		0.01	0.01	18	M/L CLIP CAP
8	ASSY- 2 SEC		0.02	0.02	18	M/L CLIP CAP
9	TOOL- \$25 K		0.03	0.03	18	M/L CLIP CAP
10	BODY, MAIN		0.10	0.10	21	M/L MAIN BODY
11	ASSY- 5 SEC		0.04	0.04	21	M/L MAIN BODY
12	TOOL- \$30 K		0.03	0.03	21	M/L MAIN BODY
13	CAP, END		0.01	0.01	22	M/L END CAP
14	TOOL- \$10 K		0.01	0.01	22	M/L END CAP

	***** TOTAL COST *****		0.62			

How

Why



FAST Diagram



- Uses
 - Identifying functions to brainstorm.
 - Documenting team's understanding of their system
 - Bring new people up to speed - transfer/share knowledge of system
 - Functional cost analysis
 - Benchmarking
 - Organizational responsibility flow
 - Functional Job descriptions
 - Training needs analysis

Value Analysis and FAST Diagrams



Questions?

