

KEPNER-FOURIE ROOT CAUSE ANALYSIS

Presented by Thinking Dimensions LLC.



Virginia Manufacturers Association Forum

AGENDA

1 Root Cause Analysis... An Overworked Tool

2 Overview of the Kepner-Fourie Root Cause Analysis (RCA)

3 Demonstration of the RCA Process

3.1 Problem Statement

3.2 Interrogative Questions

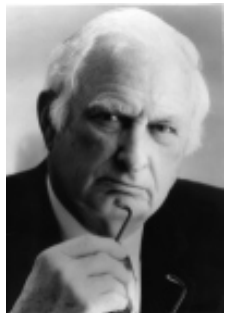
3.3 Danger of the 5 Whys

4 A Customer Experience- Eric Jolly, Philip Morris USA

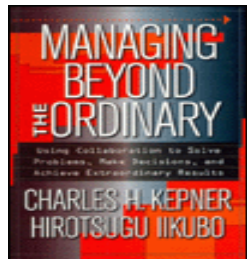
5 Summary and Questions

INTELLECTUAL FOUNDATION

Dr. Chuck Kepner

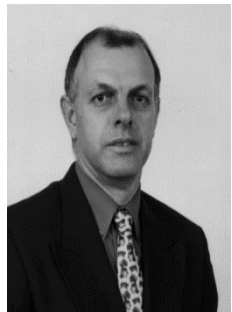


Developed by Dr. Chuck Kepner and Dr. Matthys Fourie



Need for Innovation in the processes

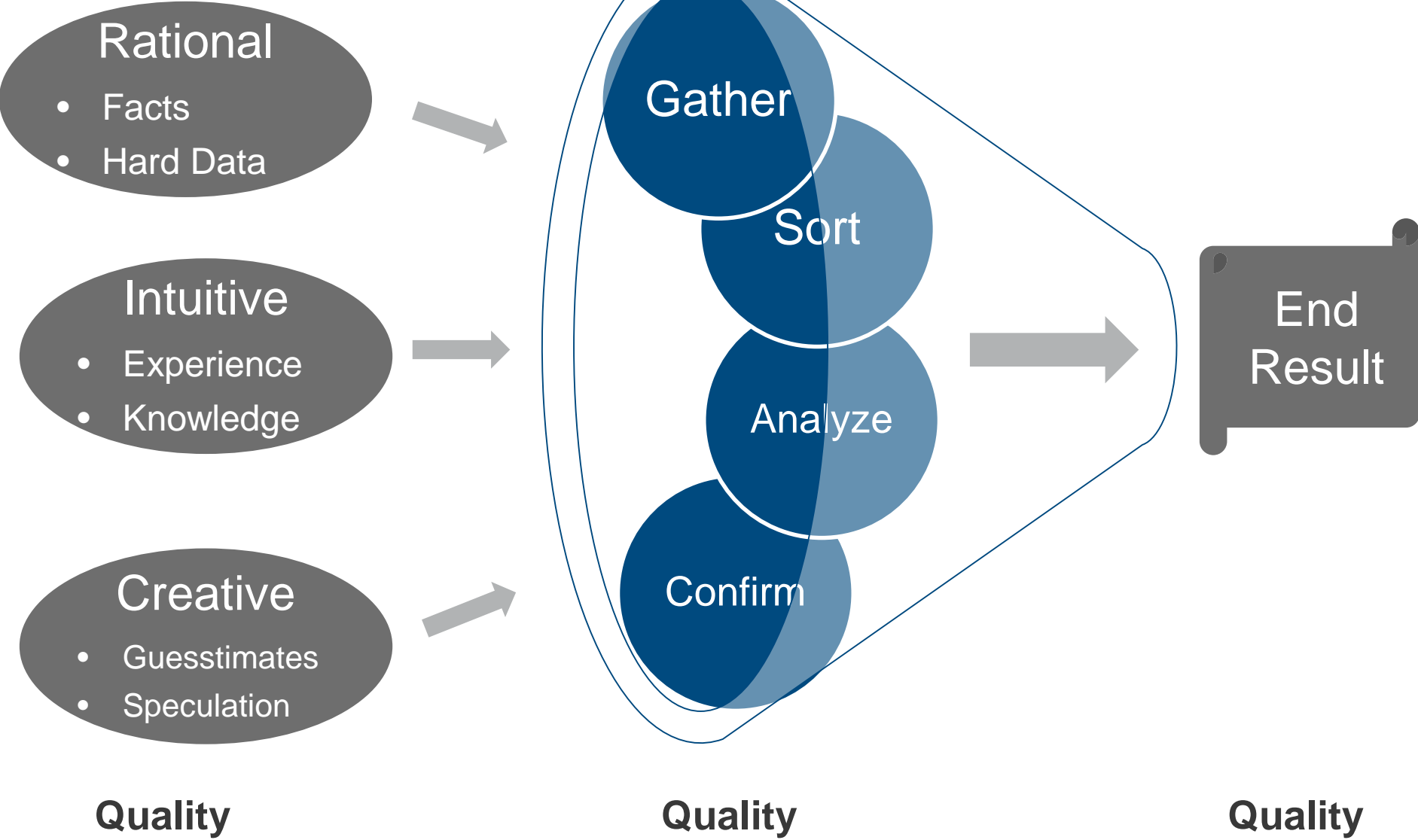
Dr. Matthys Fourie

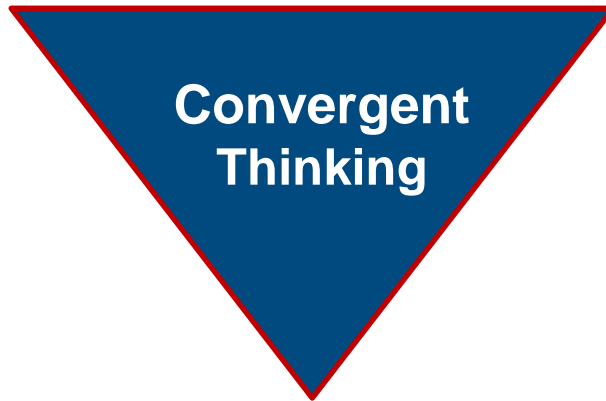
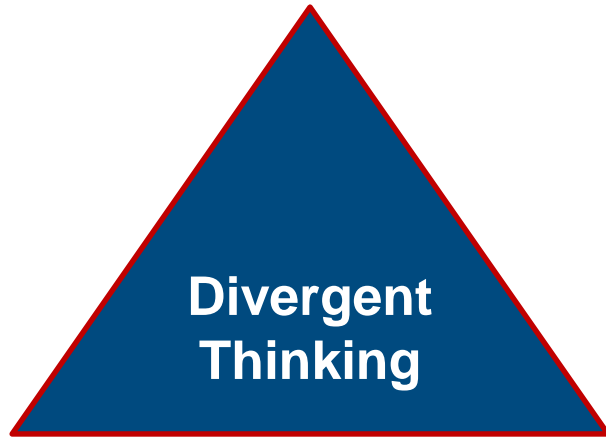


Ability to recognize & integrate the intuitive & creative aspects of problem solving with the traditional, rational processes

Scalable approaches to handle different tiers of problems and complexity levels

THINKING ABOUT THINKING AS A PROCESS





Procedure for Addressing a Problem

1. State the Problem
2. Gather Information
3. Evaluate for Causes
4. Confirm True Cause
 - a) Testing and Verifying
 - b) Determine Root Cause

Factual Information

Intuitive Analysis

Tier 1 Typical Problem with typical causes
> “TOYF” Approach/Check List

Tier 2 Atypical problem with expert analyses... but
no proof as to which one is the ‘True Cause’
> Intuitive Approach to verify True Cause

Tier 3 Atypical problem. No Ideas... Houston, we have a
problem
> Investigative Approach (deep dive with metrics)

K • E • P • N • E • R

K
and
F

F • O • U • R • I • E

ThinkingWise

PURPOSE: To determine the correct focus of complex/vague problems

CauseWise

PURPOSE: To find the true cause(s) of a deviation

PriorityWise

PURPOSE: To prioritize problems

RiskWise

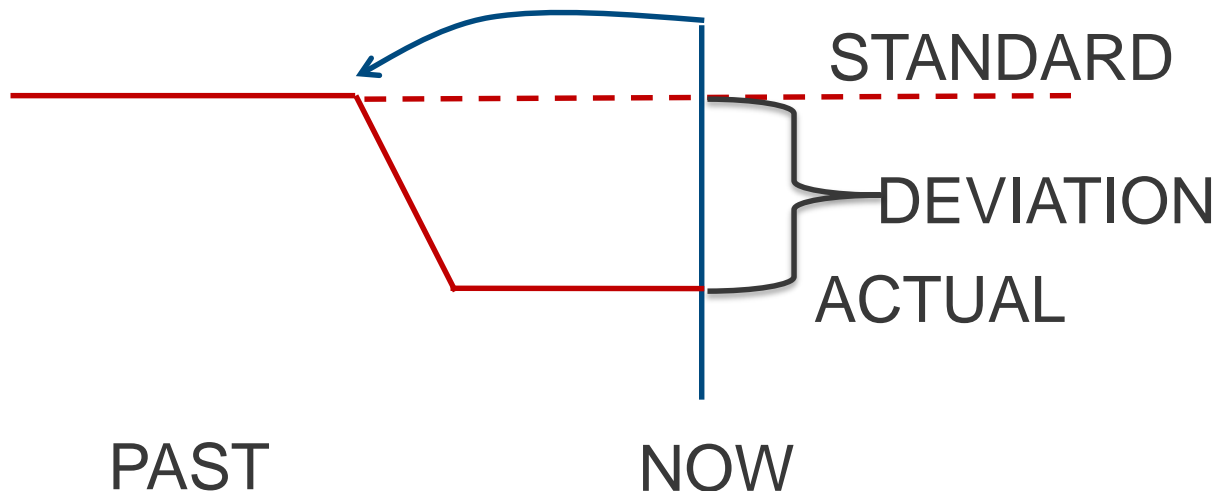
PURPOSE: To avoid future problems

SolutionWise

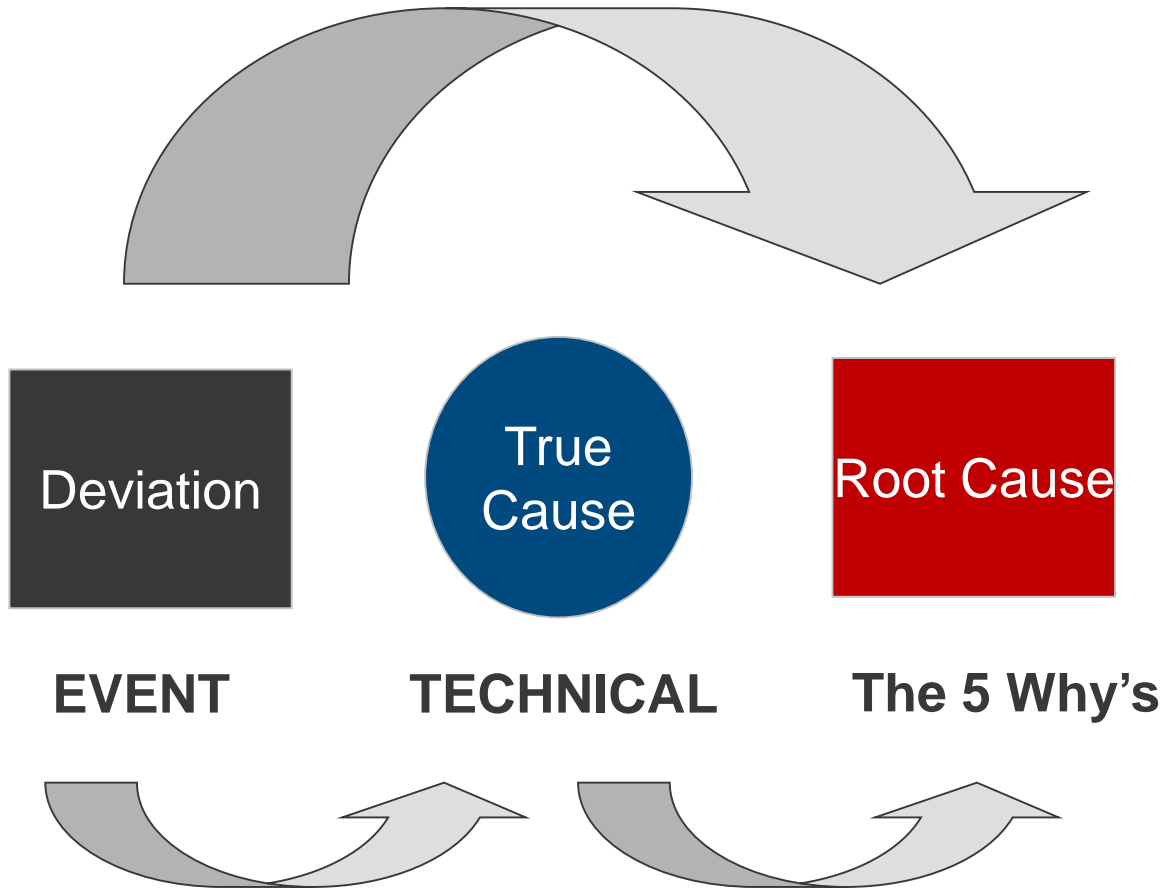
PURPOSE: To find the best solution for a given situation

Conditions for a RCA

- > Deviation of actual from standard – technical in nature
- > Cause unknown or unproven
- > Need to find cause & preventative actions



PITFALLS IN RCA



- Pitfall is looking for the Root Cause first
- First look for the Technical reason – True Cause
- Once verified, then look for the Root Cause – people, process, policy

STEPS IN CAUSEWISE

1. Determine Problem Statement

2. Clarify Problem Detail

Is/But Not

Why/(Not)

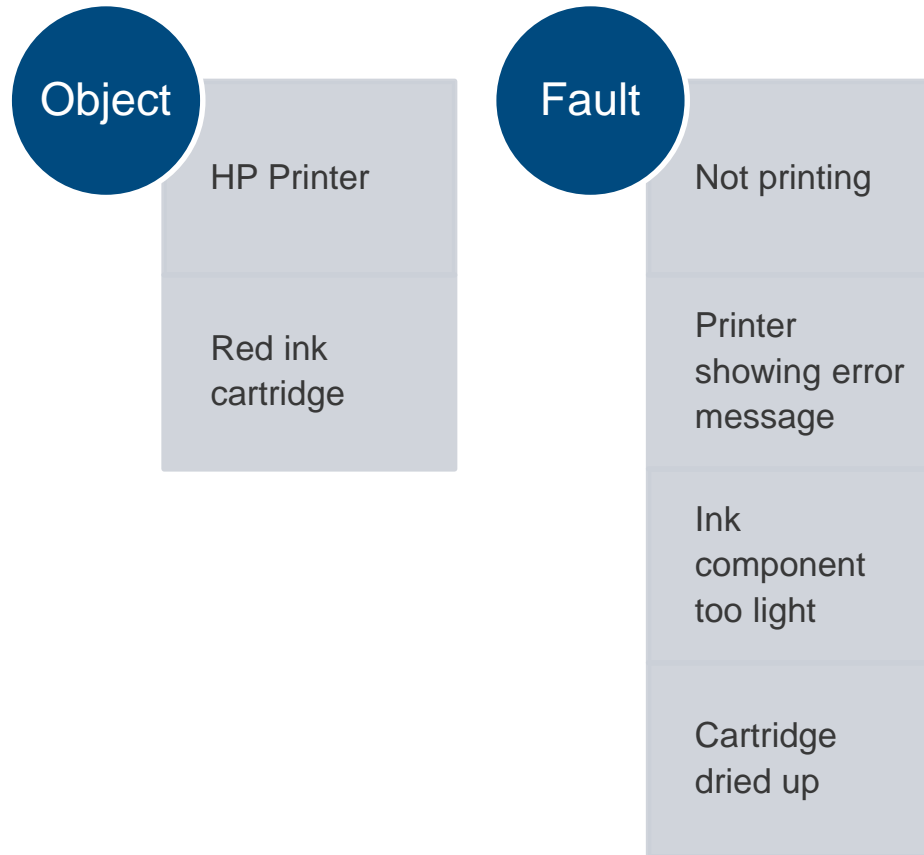
3. Generate Causes

4. Confirm True Cause

Testing

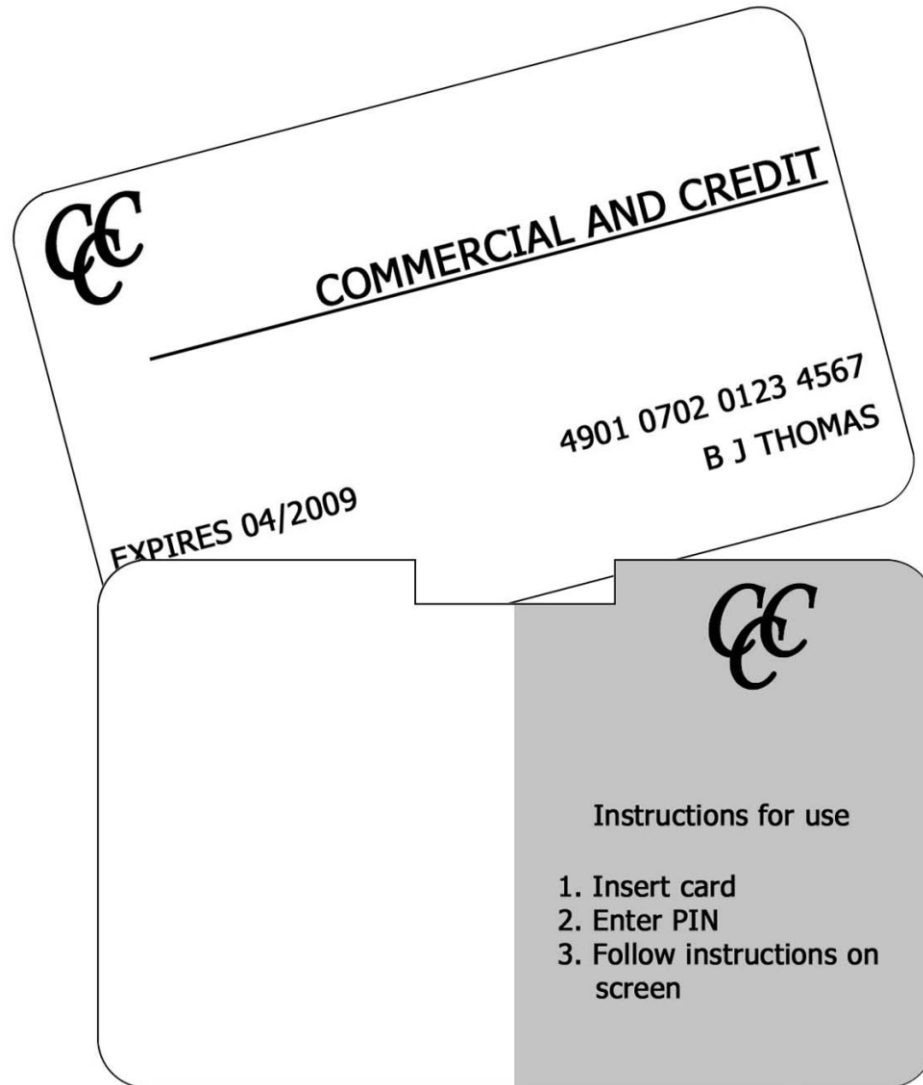
Verification

PROBLEM STATEMENT



> Be specific. One object, one fault

CASE STUDY – FAULTY CARDS



CAUSEWISE- FAULTY CARDS

Step 1: Problem Statement	
Credit Card Embossing	Flattened
Step 2: Problem Detail	

“IS”	“BUT NOT”	“WHY (NOT)”
OBJECT		
FAULT		
WHERE in the world		
WHERE on the object		
WHEN		
UNIQUE/UNUSUAL		

Step 3: Possible Causes and Testing

PROBLEM STATEMENT – FAULTY CARDS



CAUSEWISE- FAULTY CARDS

Step 1: Problem Statement Credit Card Embossing Flattened
Step 2: Problem Detail

Step 3: Possible Causes and Testing

“IS”	“BUT NOT”	“WHY (NOT)”
OBJECT: Credit Card Embossing		
FAULT Flattened		
WHERE in the world		
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CAUSEWISE- FAULTY CARDS

Step 1: Problem Statement Credit Card Embossing Flattened
Step 2: Problem Detail

Step 3: Possible Causes and Testing

“IS”	“BUT NOT”	“WHY (NOT)”
OBJECT: Credit Card Embossing	Savings Card Embossing	Different Supplier Frequency Of Use (More) Manual Processing
FAULT Flattened		
WHERE in the world		
WHERE on the object		
WHEN		
UNIQUE/UNUSUAL		

CAUSEWISE- FAULTY CARDS

Step 1: Problem Statement Credit Card Embossing Flattened
Step 2: Problem Detail

Step 3: Possible Causes and Testing

“IS”	“BUT NOT”	“WHY (NOT)”
OBJECT: Credit Card Embossing	Savings Card Embossing	Different Supplier Frequency Of Use (More) Manual Processing
FAULT Flattened	Too High, Wrong Place, Damaged, Incorrect Information	Excessive Heat, Chemical Reaction, Not Embossed At All, Excessive Rubbing
WHERE in the world		
WHERE on the object		
WHEN		
UNIQUE/UNUSUAL		

CAUSEWISE- FAULTY CARDS

Step 1: Problem Statement Credit Card Embossing Flattened
Step 2: Problem Detail

Step 3: Possible Causes and Testing

“IS”	“BUT NOT”	“WHY (NOT)”
OBJECT: Credit Card Embossing	Savings Card Embossing	Different Supplier Frequency Of Use (More) Manual Processing
FAULT Flattened	Too High, Wrong Place, Damaged, Incorrect Information	Excessive Heat, Chemical Reaction, Not Embossed At All, Excessive Rubbing
WHERE in the world Nationwide	Specific Areas	Something At Factory, Manual Machine
WHERE on the object		
WHEN		
UNIQUE/UNUSU		

CAUSEWISE- FAULTY CARDS

Step 1: Problem Statement Credit Card Embossing Flattened
Step 2: Problem Detail

“IS”	“BUT NOT”	“WHY (NOT)”
OBJECT: Credit Card Embossing	Savings Card Embossing	Different Supplier Frequency Of Use (More) Manual Processing
FAULT Flattened	Too High, Wrong Place, Damaged, Incorrect Information	Excessive Heat, Chemical Reaction, Not Embossed At All, Excessive Rubbing
WHERE in the world Nationwide	Specific Areas	Something At Factory, Manual Machine
WHERE on the object 80% RHS, 20% LHS Exactly ½ Card	Just One Side Whole Card	Orientation Of Card, Wallet Printing, Manufacturing Process
WHEN 10 days ago	Anytime Before That	Heat Wave, Card Re-issue

Step 3: Possible Causes and Testing

CAUSEWISE- FAULTY CARDS

Step 1: Problem Statement

Credit Card Embossing Flattened

Step 2: Problem Detail

“IS”	“BUT NOT”	“WHY (NOT)”
OBJECT: Credit Card Embossing	Savings Card Embossing	Different Supplier Frequency Of Use (More) Manual Processing
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WHEN 10 days ago	Anytime Before That	Heat Wave, Card Re-issue
UNIQUE/UNUSUAL		

Step 3: Possible Causes and Testing

Excessive heat causes plastic to go soft.

Inferior material cannot withstand pressure in ATM and manual machine rollers.

In some way the colors of the wallet are reacting with the plastic and making it soft.

Step 4: Verify Assumptions & True Cause

1. Excessive heat causes plastic to go soft:



2. Inferior material cannot withstand pressure in ATM and manual machine rollers:



3. In some way the colors of the wallet are reacting with the plastic and making it soft:



Now apply the 5 Whys to determine Root Cause:

Step 4: Verify Assumptions & True Cause

1. Excessive heat causes plastic to go soft:



2. Inferior material cannot withstand pressure in ATM and manual machine rollers:



3. In some way the colors of the wallet are reacting with the plastic and making it soft:



> Now apply the 5 Whys to determine Root Cause:

“Prior to our use of Kepner and Fourie CauseWise & SolutionWise, it took us from **2 weeks to several months** to “turn around” a plan of action to improve our processes and prevent re-occurrence. That time has been **reduced to less than one week** on complex issues.

On non-complex issues, the turn around time for “return to work” with the solution buy-in has been **reduced from >12 hours to 1.5 hours.”**

Quality Manager,
Norfolk Naval Shipyard

A CUSTOMER EXPERIENCE

ERIC JOLLY, CONTINUOUS IMPROVEMENT MANAGER, PHILIP
MORRIS USA



Philip Morris USA
an Altria Company

Takeaways

Problem Statement

- One Object, One Fault

True Cause vs Root Cause

- An Event in time vs A condition That Exists

Right Tool- Right Job

- Know What to Use When

CONTACT DETAILS

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