

# Kepner-Tregoe Methodology

(English version - částečně)

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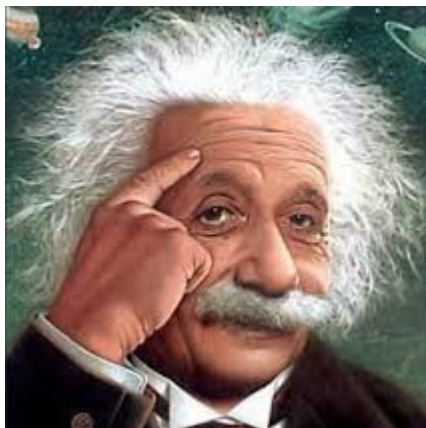
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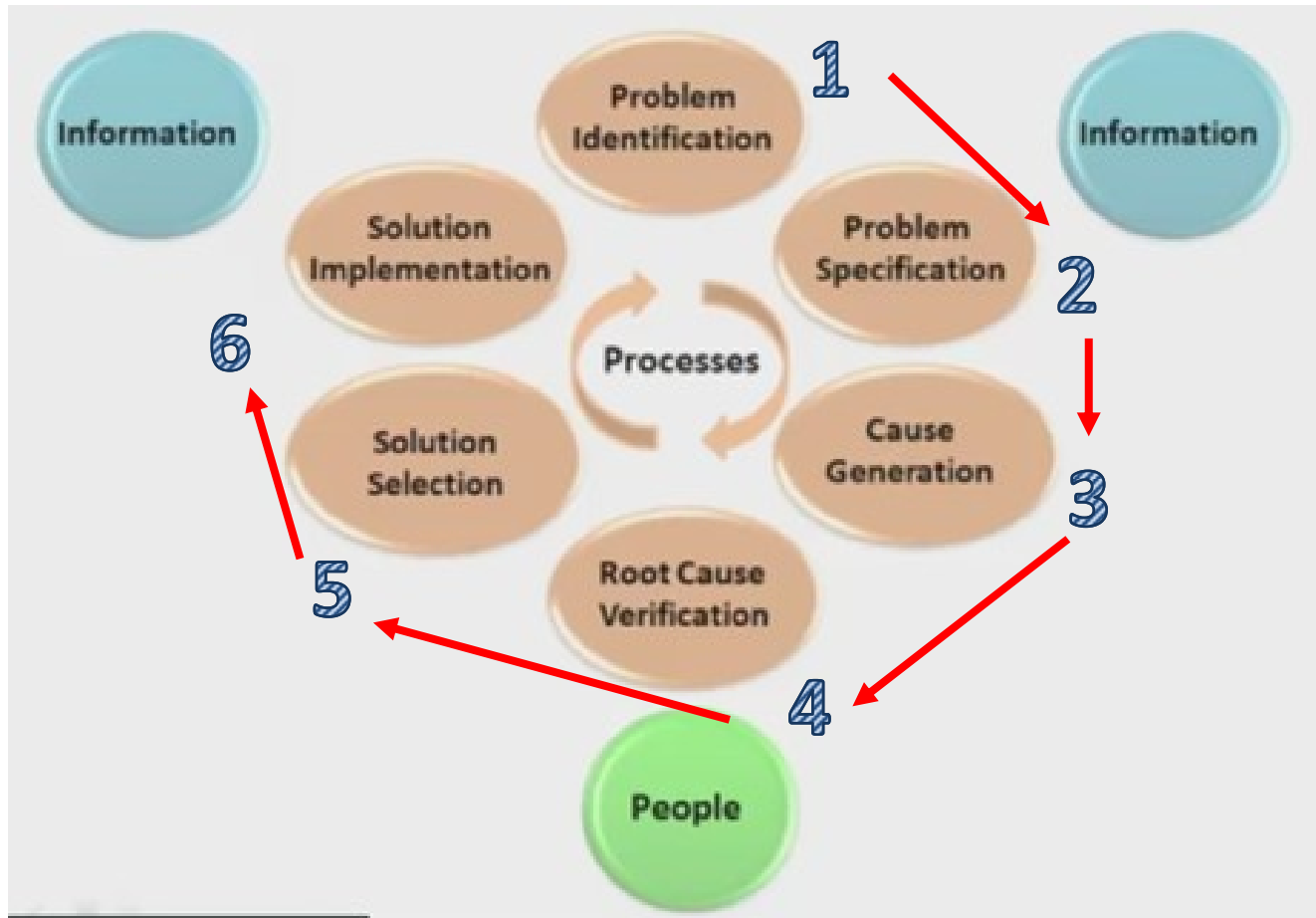
- **Albert Einstein**

*Formulace problému* je mnohem důležitější než jeho řešení,  
které může být pouze otázkou matematické nebo experimentální dovednosti.



# Related actions – na sebe navazující akce

(Formulace problému=identifikace a specifikace)



- 1 – nezvládnutí pandemické situace
- 2 – vysoké počty nakažených, vysoká smrtnost, ....
- 3 – odpírači, nedůvěra obyvatelstva v nařízení, každý hraje jenom na sebe,..
- 4 - neschopnost vlády
- 5 - změna ve vládě, nové metody obrany proti viru, očkovací centra, kampaň pro očkování ,
- 6 – zavedení a pravidla

Resource: taken from K&T videos

## Apollo 13 – Houston, Houston, do you read me ? We have a big problem....!

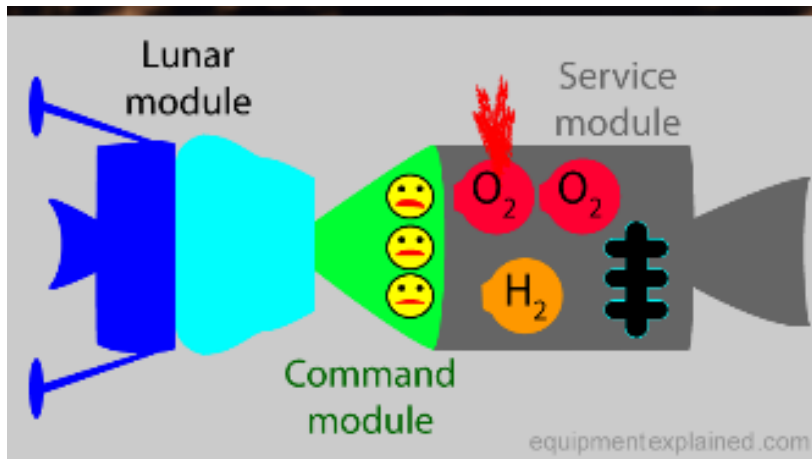


The Apollo 13 team is famous for bringing back the astronauts stranded in space by solving difficult and complex problems. The teams solving the problems has used the **Kepner-Tregoe (KT)** methodology !

# Apollo 13 – description

(problem and solution - home study)

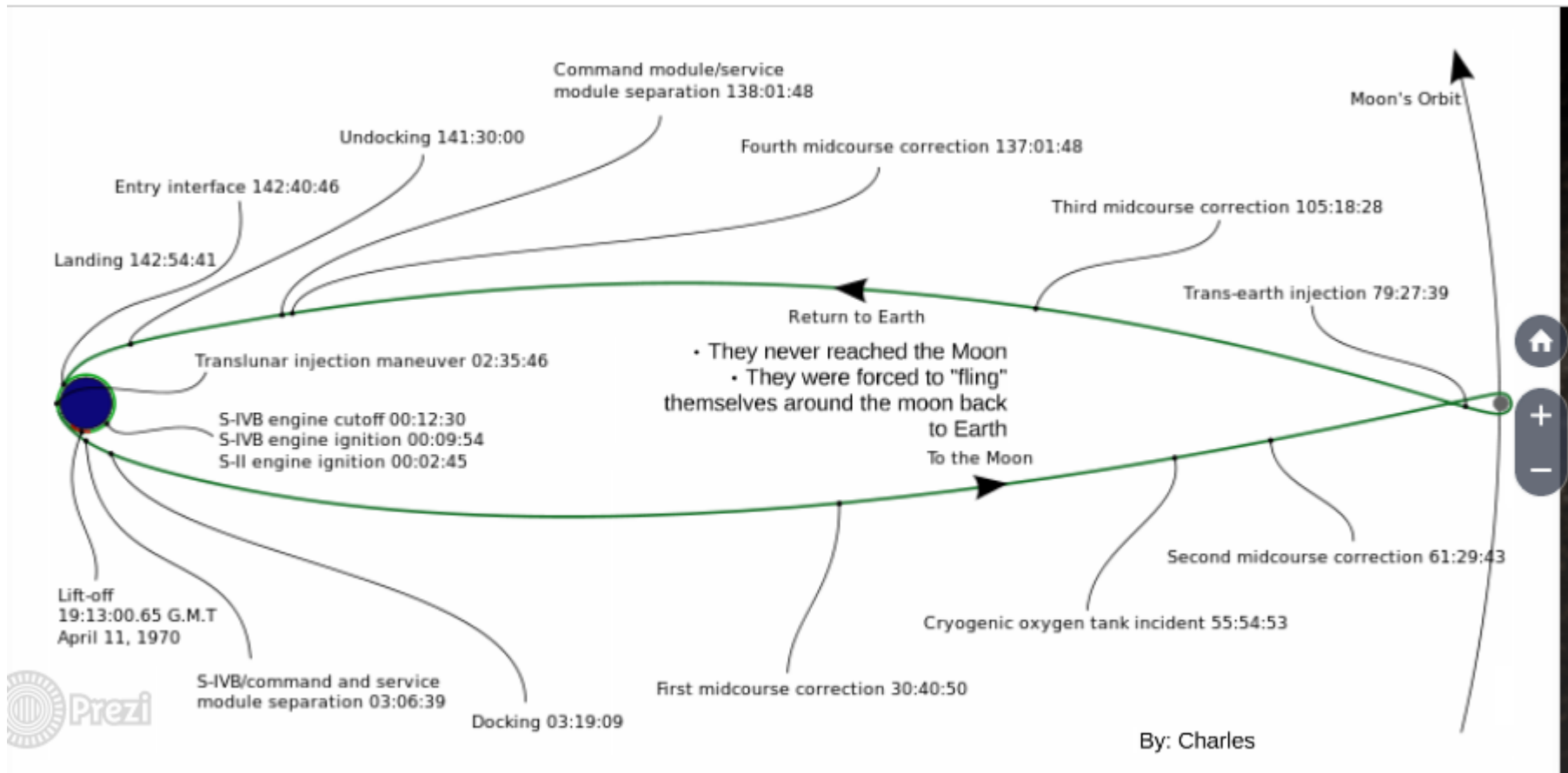
<https://spectrum.ieee.org/tech-history/space-age/apollo-13-we-have-a-solution>



<https://prezi.com/ohiqi4xzcxt/tier-v-problems-and-solutions-on-apollo-13/>

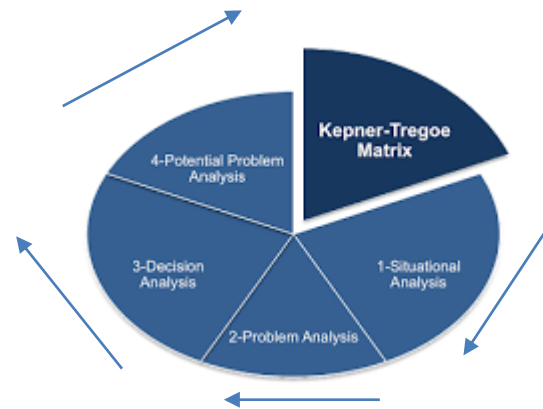
# Appolo 13 – problem description

(problem and solution)





Developed by Charles H. Kepner and Benjamin B. Tregoe in the 1960



**Kepner Tregoe is used for decision making (finding best possible choice) .**

**Nalezení nejlepšího možného rozhodnutí) ( text níže -> domácí studium)**

**It is** a structured methodology for **gathering information** and prioritizing and evaluating it.

**Strukturovaný přístup jak shromáždit informace a dát jim správnou prioritu**

**It is** very detailed and complex method applicable in many areas, which is much broader than just idea selection.

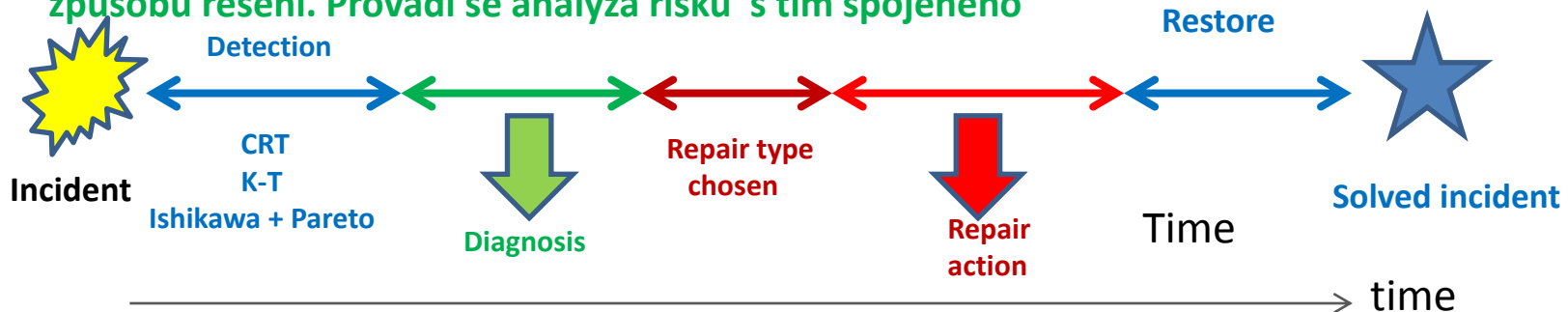
**Detailní a komplexní metoda, kterou je možné aplikovat v různých oblastech- není to pouze výběr plánu (postupu) respektive nápadu jak řešit problém**

**It is** called also a **root cause analysis** and decision-making method.

**Jde o analýzu klíčového problému – úzkého místa (TOC přístup, Ishikawa FBD přístup)**

**It is** a step-by-step approach for systematically solving problems, making decisions, and analyzing potential risks.

**Přístup, kde se postupuje krok po kroku, analyzuje se klíčový problém, rozhodne se o způsobu řešení. Provádí se analýza riziku s tím spojeného**





# K-T postup

Nemusíte být zrovna astronauti, abyste mohli tuto metodu uplatnit v praxi. Pravdou je, že se vám bude hodit v jakékoliv práci – zvláště pokud se pohybujete v manažerské oblasti. Následuje popis 4 základních kroků

## 1. Vyhodnocení situace

Orientujte se. Situace může vypadat složitě, ale po základní analýze budete mít pravděpodobně více jasno. Udělejte si seznam toho, co je potřeba řešit a to včetně nastavení priorit jednotlivých kroků

## 2. Analýza problému

Popište všechny příčiny. Nakonec najdete, kde je zakopaný pes (Ishikawa, CRT)

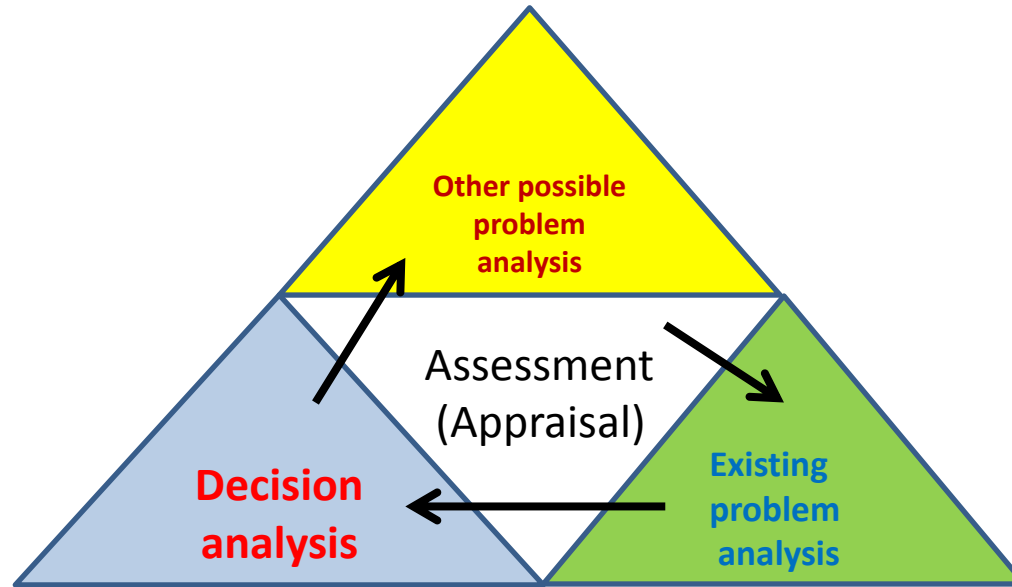
## 3. Rozhodovací analýza

Problém a příčinu už znáte. Najděte možné řešení. Zkuste to vícekrát a proveďte PROS a CONS hodnocení.

## 4. Analýza rizik

Nepřehledné situace, nežádoucí jevy, nebezpečí špatného rozhodnutí, nesprávné nastavení priorit toho co se má řešit a jak se to má řešit.

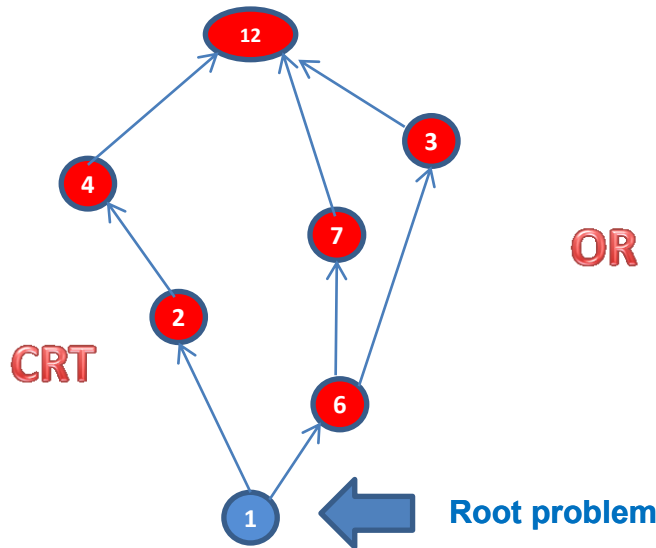
# K-T → grafické znázornění předchozích kroků



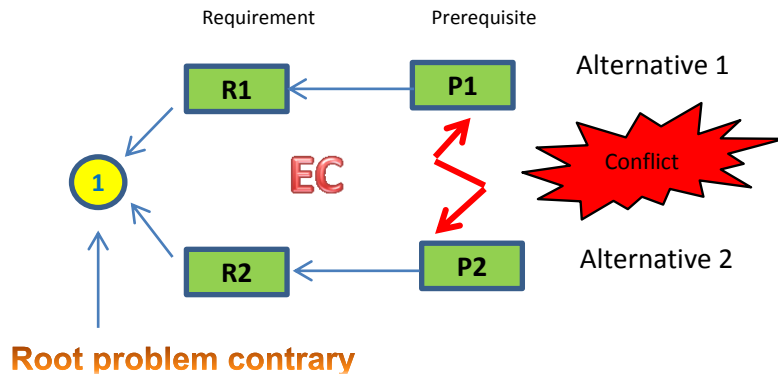
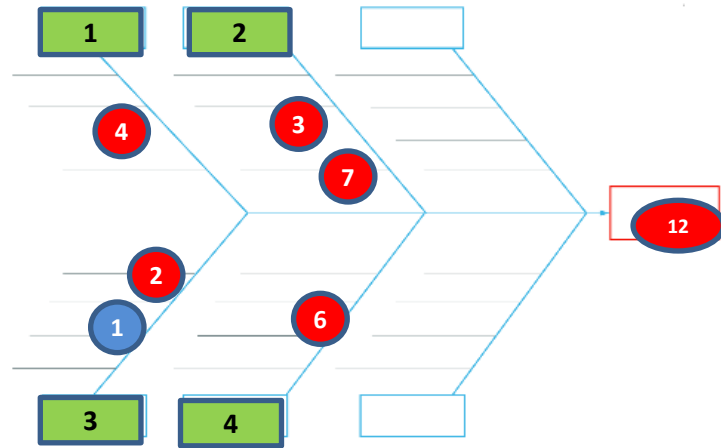
Appraisal=review= assessment=evaluation = **Hodnocení**

1. Assessment (appraisal) – priorities assigned to current situation
2. **Existing Problem analysis – to find root problem (cause)**
3. **Decision analysis – to select way to react (MaxiMax, MaxiMin,..)**
4. **Future problem analysis (risk analysis)**

# CRT-Ishikawa – bylo již prezentováno



OR



	1	2	3	4	6	7
John	8	7	4	3	5	6
Caroline	9	5	7	8	5	6
Mean	8,5	6	5,5	5,5	5	6

- 1** = Nature (see, forest, mountains, jungle, river,...)
- 2** = Hotel type
- 3** = Amenities (pool, golf course, wellness,...)
- 4** = Period (spring, summer, fall, winter).

Alternative means how to solve problem and what kind of pay-off you will get

# Vyhodnocení situace – doplnění již sdělených informací

- Identifikace problémů a jejich seznam
- Rozdělit sféry zájmu a nastavení priorit - co řešit teď a co později
- Jak problém postupně řešit – step-by-step approach

## Klíčové otázky K-T metody

- Plan for **who** is involved, **what** they will be doing, **where** they will be involved, **when** it happened and the **extent** of involvement (**magnitude**)
- **KDO – CO – KDE – KDY - ROZSAH**

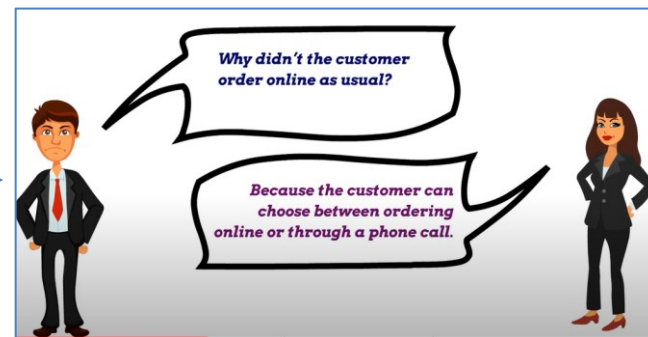
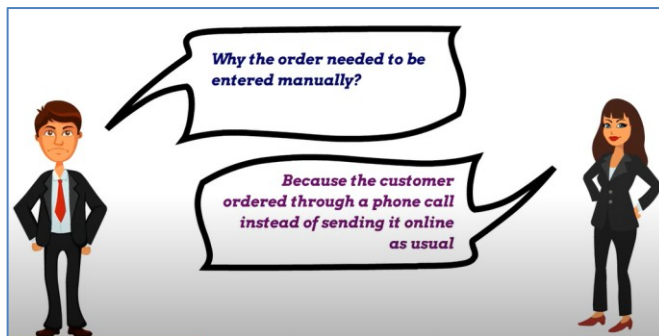
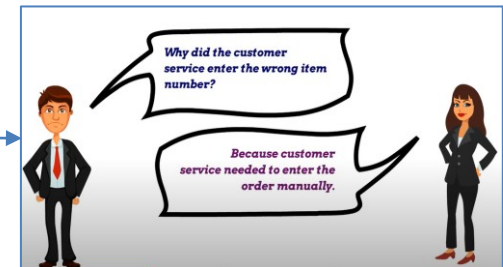
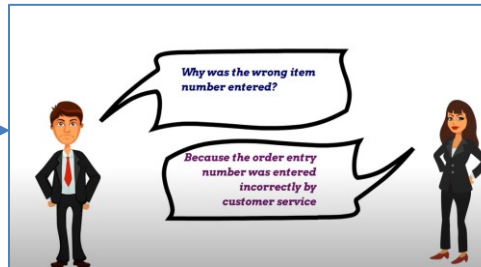
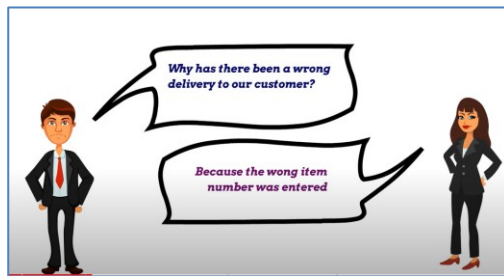
# Step-by-Step Approach 8-step

- **8-Step Problem Solving Process (one possibility)**
  1. Step 1: Define the Problem. What is the problem? ...
  2. Step 2: Clarify the Problem. ...
  3. Step 3: Define the Goals. ...
  4. Step 4: Identify **Root Cause** of the Problem. ...
  5. Step 5: Develop Action Plan. ...
  6. Step 6: Execute Action Plan. ...
  7. Step 7: Evaluate the Results. ...
  8. Step 8: Continuously Improve
- Similar to Deming cycle (see OM introduction)

# Step-by-Step Approach 5 Whys-method I.

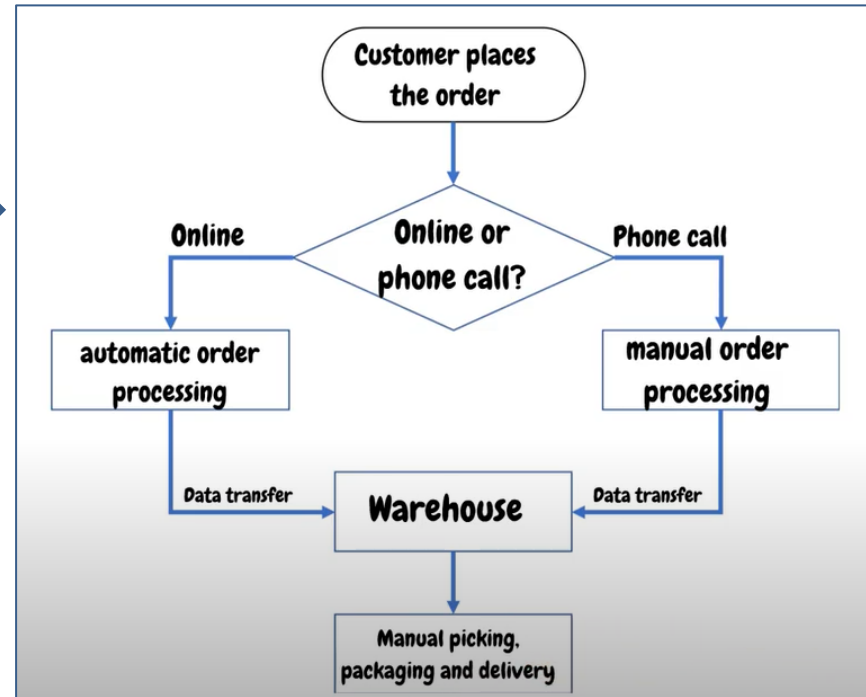
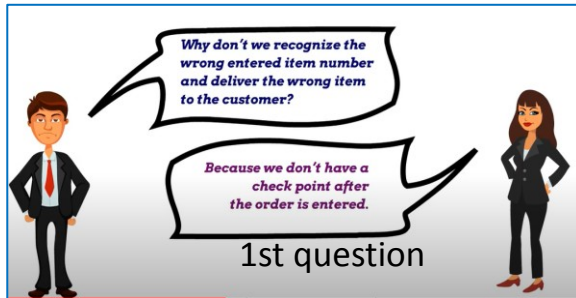


The method is to go step by step to get the real cause of a problem by asking Why? Questions



Here is a set of the **first five questions**, followed by the next question to find the root cause

# Step-by-Step Approach 5 Whys-method II.



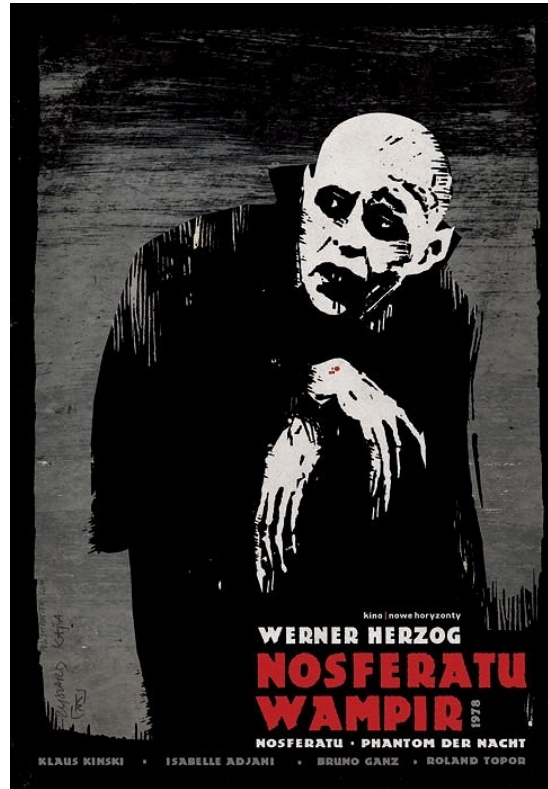
# Graphical representation of the process



[103\) Problem Solving Techniques: 5-Why-Method, Flowchart, Mind-Map - YouTube](#)

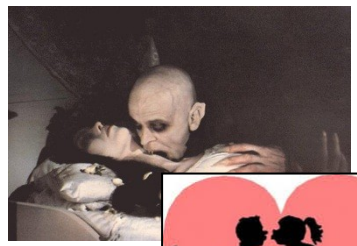
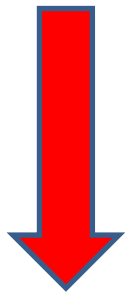


# Questions and the fabulous world of the vampires



To keep this very unusual economic comparisons in your mind

# WHO WHAT WHEN WHERE EXTENT



What not



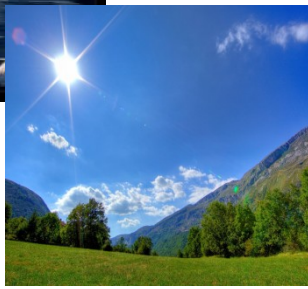
Where not



Who not



When not



Magnitude



# Rozhodovací analýza - výběr mezi více alternativami – část rozhodovací analýzy- krok 3

- Identifikace - > co bylo rozhodnuto a jaké metody s použijí
- Klasifikace cílů -> důležité a méně důležité cíle
- Rozdělení cílů a nastavení míry jejich důležitosti
  - **must (must-to-have)** – musíme to mít (finanční reporting požadovaný zákonem)
  - **want (nice-to-have)** - bylo to hezké mít to všechno v barvách
  - **faktor důležitosti-váha (1-10, kde 10 je nejvíce důležitý faktor nebo i 1-100)**
- Vytvoří se alternativy – různé metody řešení problému
- Alternativám se určí skupina **MUST-TO-HAVE** nebo **NICE-TO -HAVE** skupina a váhy (**faktory důležitosti**)
- Posoudí se nepříznivé (škodlivé) důsledky nápravných kroků (hodnocení rizika) a potvrzení a realizace té nejlepší volby
- Analýzy nákladů spojených s nápravnými kroky
- Aplikuje se nejlepší možná volba

# Criteria rating

“Must” Criteria		Car 1		Car 2		Car 3		Car 4	
Cost under \$9,000		Yes		Yes		Yes		Yes	
Available within one week		Yes		Yes		Yes		No	
		Car 1		Car 2		Car 3			
“Want” Criteria	Importance*	Criterion rating	Weighted score	Criterion rating	Weighted score	Criterion rating	Weighted score		
Good gas mileage	7	5	$7 \times 5 = 35$	6	$7 \times 6 = 42$	8	$7 \times 8 = 56$		
Sporty	8	5	$8 \times 5 = 40$	7	$8 \times 7 = 56$	4	$8 \times 4 = 32$		
Color (blue)	3	10	$3 \times 10 = 30$	0	$3 \times 0 = 0$	0	$3 \times 0 = 0$		
AM/FM stereo	5	7	$5 \times 7 = 35$	8	$5 \times 8 = 40$	3	$5 \times 3 = 15$		
Good condition	10	5	$10 \times 5 = 50$	6	$10 \times 6 = 60$	8	$10 \times 8 = 80$		
Low mileage	6	6	$6 \times 6 = 36$	4	$6 \times 4 = 24$	5	$6 \times 5 = 30$		
Relatively new	7	3	$7 \times 3 = 21$	5	$7 \times 5 = 35$	5	$7 \times 5 = 35$		
TOTAL WEIGHTED SCORE (WS)			247			257			248

See similar example on the next slide

Importance can be understood as a Satisfaction score, meaning desirable but not essential. Criteria rating is related to want criteria and every car property

# Which car to buy ?

<b>MUSTS</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>
Power Brakes	GO	GO	GO	GO
Power Steering	GO	GO	GO	GO
AM/FM Stereo	GO	GO	NO GO	GO
Automatic	GO	GO	NO GO	GO
Under \$15,000	GO	GO	GO	GO

<b>WANTS</b>	Weight	Score	W x S	Score	W x S	Score	W x S	Score	W x S
AirCon	10	10	100	0	0			10	100
Cassette	7	6	42	10	70			10	70
Antilock Brakes	9	0	0	10	90			0	0
Air Bag	8	5	40	10	80			5	40
Rear Demist	6	10	60	0	0			0	0
Engine Size	6	8	48	6	36			10	60
Central Lock	5	5	25	10	50			5	25
Metal Paint	4	0	0	10	40			10	40
Warranty	8	10	80	7	56			3	24
Resale Value	7	7	49	7	49			4	28
<b>TOTALS</b>			444		471				387

Criterion rating

Importance score, meaning desirable but not essential.

Zákazníci by to rádi měli, ale není to vůbec nutné a nepřináší to žádnou velkou hodnotu

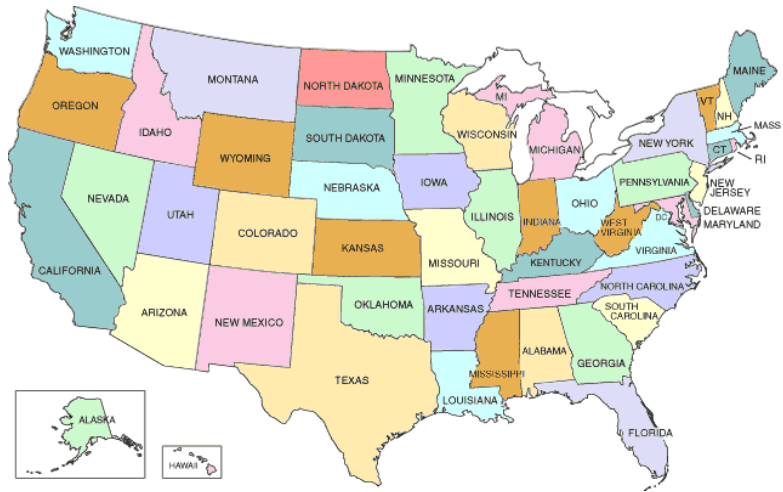
# Step 1 and Step 2

## **Step 1 Problem: Pick a replacement vehicle for the motor pool fleet**

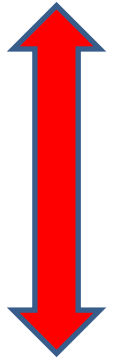
The definition of the problem dictates the requirements. As the vehicle is for a motor pool, the requirements will differ from those for a family car, for example.

## **Step 2 Requirements:**

1. Vehicle shall be made in **U. S. A.**
2. Vehicle shall seat at least **four adults**, but no more than **six adults**
3. Vehicle shall cost no more than **\$28,000**
4. Vehicle shall be **new and the current model year**



Min



Max



Max 28000 USD

**New car  
(current model)**



# Step 3 and Step 4

## **Step 3 Goals:**

- Maximize passenger comfort
- Maximize passenger safety
- Maximize fuel-efficiency
- Maximize reliability of the car
- Minimize investment cost

## **Step 4 Alternatives:**

There are many alternatives but the requirements eliminate the consideration of a number of them:

Requirement 1 eliminates the products not manufactured in the USA

Requirement 2 eliminates vans, buses, and sports cars (Ferrari no !!!!)

Requirement 3 eliminates high-end luxury cars

Requirement 4 eliminates used vehicles



# Step 5

## Step 5 Criteria:

“Maximize comfort” will be based on the combined rear seat leg and shoulder room. (Note: front seat passenger leg and shoulder room was found to be too nearly the same to discriminate among the alternatives.) **5**

“Maximize safety” will be based on the total number of stars awarded by the National Highway Traffic Safety Administration for head-on and side impact. **10**

“Maximize fuel efficiency” will be based on the EPA fuel consumption for city driving. **7**

“Maximize reliability” will be based on the reliability rating given each vehicle by a consumer product testing company. **9**

“Minimize Cost” will be based on the purchase price. **10**

**Weighted criteria vector  $C(5,10,7,9,10)$  are values assigned by decision makers !!!!**

# Kepner-Tregoe table

(for 4 cars : Arrow, Baton, Carefree and **Dash**)

Criteria/ Want objectives	Criteria Weight	<i>Arrow</i>	Alter- native Score	Total Score
Comfort	5	86 in. rear seat leg and shoulder room, seats 5	6	30
Safety	10	14 stars	5	50
Fuel efficiency	7	21 mpg	9	63
Reliability	9	80	9	81
Cost	10	\$26,000	5	50
		<b>Total</b>		<b>274</b>
		<i>Baton</i>		
Comfort	5	88 in. rear seat leg and shoulder room, seats 6	9	45
Safety	10	17 stars	8	80
Fuel efficiency	7	19 mpg	8	56
Reliability	9	70	7	63
Cost	10	\$21,000	8	80
		<b>Total</b>		<b>324</b>
		<i>Carefree</i>		
Comfort	5	80 in. rear seat leg and shoulder room, seats 5	4	20
Safety	10	15 stars	6	60
Fuel efficiency	7	22 mpg	10	70
Reliability	9	65	5	45
Cost	10	\$17,000	10	100
		<b>Total</b>		<b>295</b>
		<i>Dash</i>		
Comfort	5	89 in rear seat leg and shoulder room, seats 6	10	50
Safety	10	19 stars	10	100
Fuel efficiency	7	21 mpg	9	63
Reliability	9	85	10	90
Cost	10	\$24,000	6	60
		<b>Total</b>		<b>363</b>

# Last step – Validation (check)

## Last Step Validate Solution:

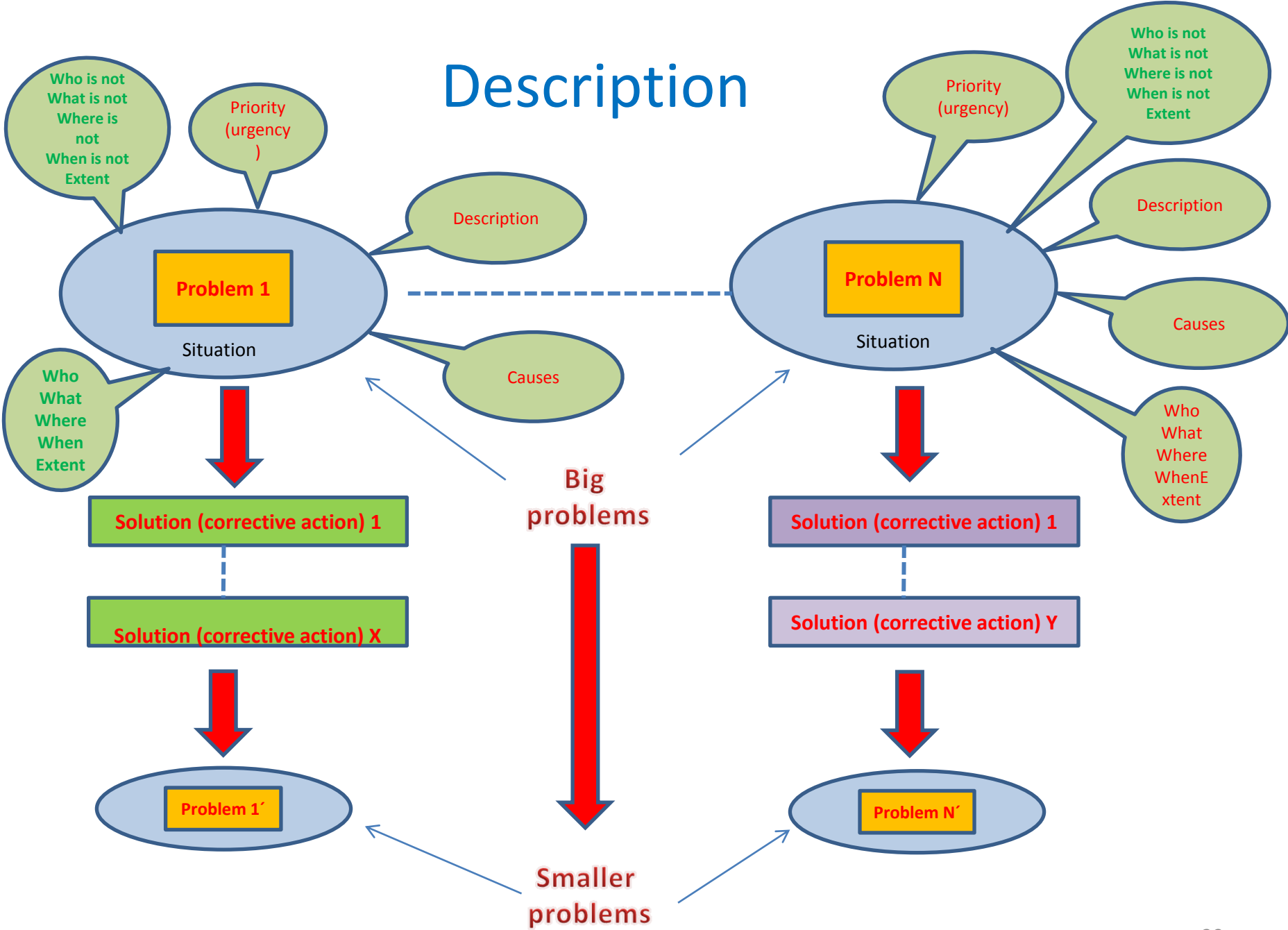
The totals of the weighted scores show that the **Dash** most nearly meets the wants/goals (or put another way, has the most “benefits”). Dash meets all the requirements and solves the problem !!!



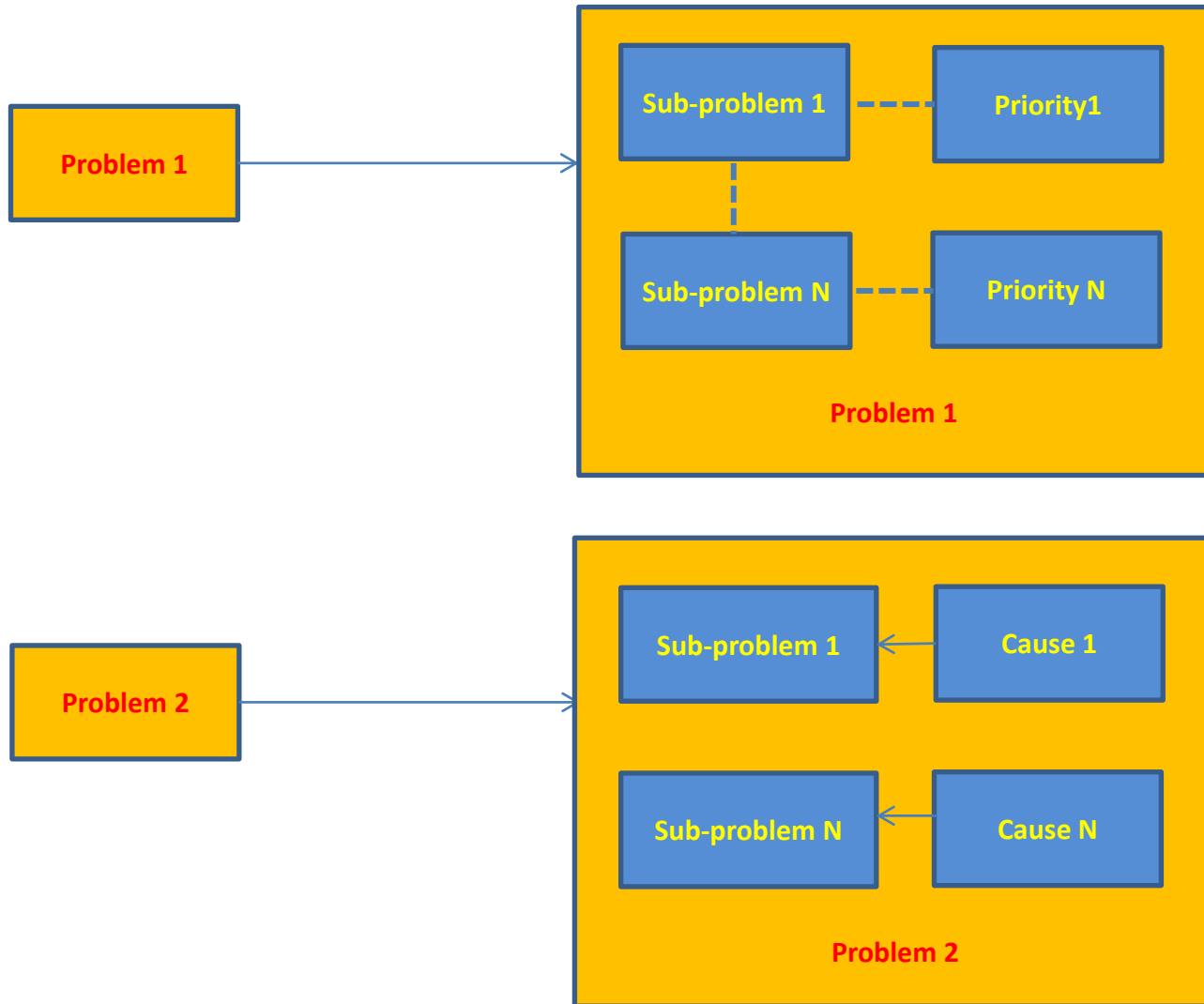
# (Analýza problému) – kroky 1-4 (snímek 8)

- State the problem (*definice a popis problému*) Specify the problem by asking (*důležité otázky, které nyní budeme probírat na příkladech*):  
**what is and what is not, who is and who is not, where is and where is not**
- Develop possible causes of the problem (*similar to CRT or Ishikawa*) – (*detekce příčin -> opět popis na snímku číslo 8*)
- Test and verify possible causes -**testování a verifikace možných příčin**
- Determine the most probable cause (**root cause**) -**nalezení klíčového problému**
- Verify any assumptions - **verifikace předpokladů**
- Try the best possible solution and monitor what will be a situation after applied correctives step- **aplikace zpětné vazby- korekce nežádoucího stavu**

# Description

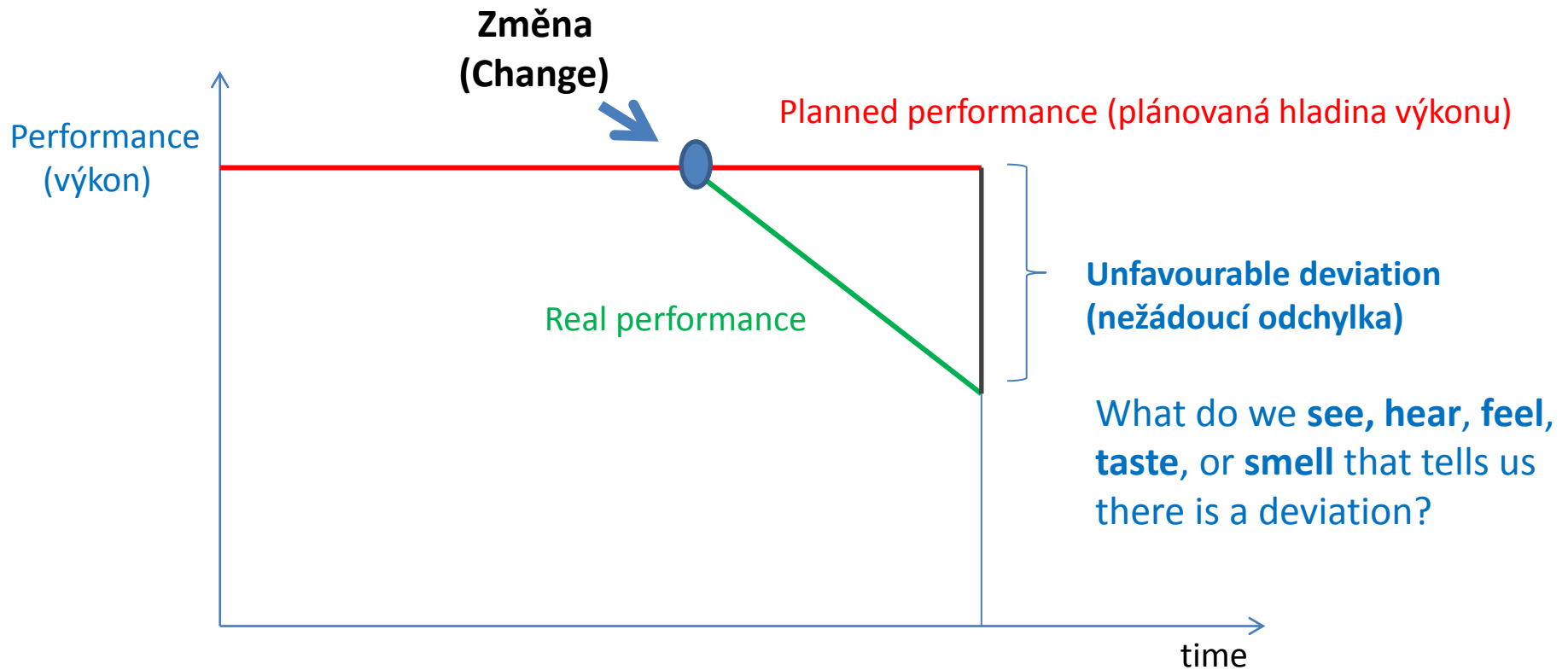


# Decomposition, priorities and causes



# Example of problem manifestation

(snížení účinnosti)



Final effect of the **Change** = **PROBLEM** (e.g. server crashed, hard disk with database crashed)

Then we have to ask : Who, What, Where, When, and to what Extent –Size (how much, how many)?

And opposite types of questions as well Who is not, What is not ,Where is not,.....

# Deviation analysis - questions related to WHAT


- What has the deviation? What does not have the deviation?
- What is the specific deviation? What is not the deviation?
- What similar object(s) could have the deviation, but does not?
- What other deviations could be reasonably observed, but are not?

## The questions :

WHEN It is  
WHERE It is  
WHO It was  
HOW It happened

&

WHEN  
WHERE  
WHO  
HOW



Is Not

are similar in content, so we do not include them here **for sake of simlicity**



# Server crashed !!!! **home study**

- **Server crashed** (to je opravdu zjednodušená definice problému)
- **The e-mail system crashed after the 3rd shift support engineer applied hot-fix XYZ to Exchange Server 123** (better definition of the problem)
- **Comment** : WHO is not mentioned here but could be Different staff (3 shift) –see table

	IS	COULD BE but IS NOT	DIFFERENCES	CHANGES
WHAT	System failure	Similar systems/situations not failed	?	?
WHERE	Failure location	Other locations that did not fail	?	?
WHEN	Failure time	Other times where failure did not occur	?	?
EXTENT	Other failed systems	Other systems without failure	?	?



	IS	COULD BE but IS NOT	DIFFERENCES	CHANGES
WHAT	Exchange Server 123 crashed upon application of hot-fix XYZ	Other Exchange Servers getting hot-fix XYZ	Different staff (3rd shift) applied this hot-fix	New patch procedure from vendor
WHERE	3rd floor production room without vendor/contractor support	Anywhere else with vendor/contractor support	Normally done by vendor	New procedure, first time 3rd shift applies hot-fixes
WHEN	Last night, 1:35am	Any other time or location	None noted	
EXTENT	Any Exchange Server on 3rd floor	Other servers		

History (and best practice) says that the root cause of the problem is probably due to some **recent change**. **WHAT, WHERE, WHEN and EXTENT will be shown on next slides**

# Test the Most Probable Cause

home study

## Clarifying problem Analysis (example)

Potential root cause:	True if:	Probable root cause?
Exchange Server 123 has something wrong with it	Only Exchange Server 123 has this problem	Maybe
Procedure incorrect	Same procedure crashes another server	Probably
Technician error	Problem did not always reoccur	Probably not

We have to ask (where Qi =QUESTION i) :

### Question

### IS

### IS NOT

*What (identify)* Q1

Q2

*Where (locate)* Q3

Q4

*When (timing)* Q5

Q6

*Extent (magnitude)* Q7

Q8



See next slides

# Problem Analysis - What

## Is

- What specific object(s) has the deviation?
- What is the specific deviation?

### Example for Is :

1. What specific **object IS** related to the defect?  
Inventory Valuation Objects in **database A**
  2. What specifically is the defect (deviation)?  
**Inventory Adjustment does not work**
- 1-> see setup of the database and see differences  
2-> see algorithm used for calculation and parameters used.  
You can see, that in production calculation related algorithm is not functional

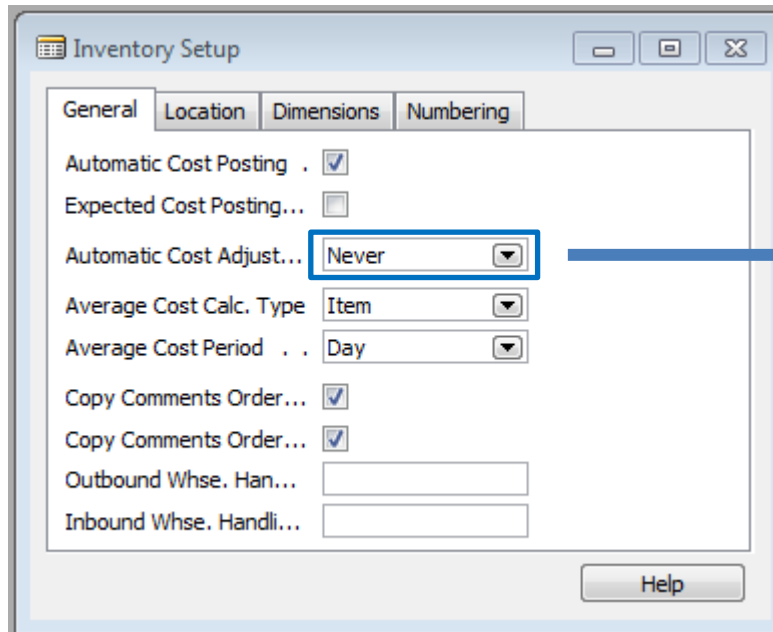
## Is Not

- What similar object(s) could have the deviation, **but does not? (It did not happen)**
- What other deviations could be reasonably observed, **but are not? (It did not happen)**

### Example for Is Not :

1. What specific **object IS NOT** related to the defect?  
Inventory Valuation Objects in **database B**
  2. What specifically is not the defect (deviation)?  
Adjustment is working – good setup in **database B**
- 1 -> Setup has another parameters **ON**  
2-> Algorithm is used also for production where not error occurs

# See two MS Dynamics Setup screens (related to the problem specified recently)



Inventory Setup

General Location Dimensions Numbering

Automatic Cost Posting .

Expected Cost Posting...

Automatic Cost Adjust... **Never** ▼

Average Cost Calc. Type Item ▼

Average Cost Period . . Day ▼

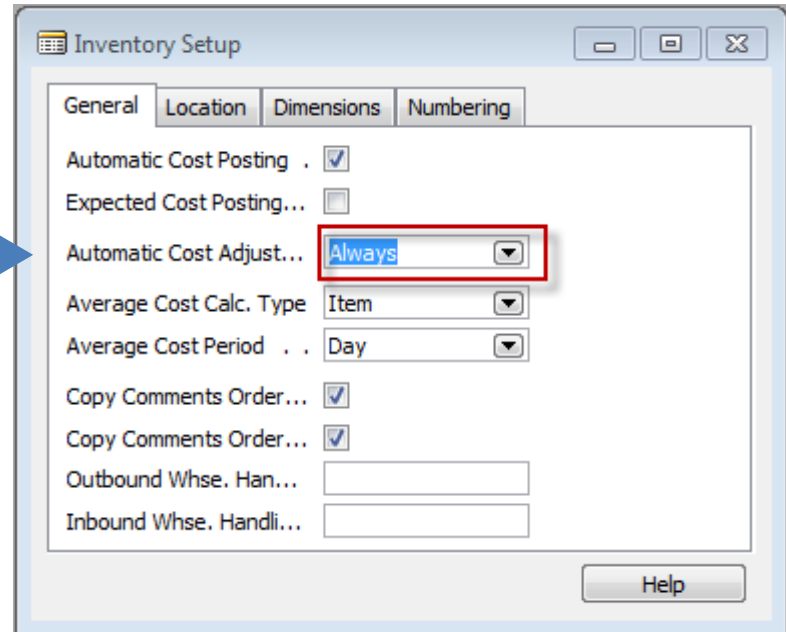
Copy Comments Order...

Copy Comments Order...

Outbound Whse. Han...

Inbound Whse. Handli...

Help



Inventory Setup

General Location Dimensions Numbering

Automatic Cost Posting .

Expected Cost Posting...

Automatic Cost Adjust... **Always** ▼

Average Cost Calc. Type Item ▼

Average Cost Period . . Day ▼

Copy Comments Order...

Copy Comments Order...

Outbound Whse. Han...

Inbound Whse. Handli...

Help

# Back to vampires : Problem Analysis - **What**

## Is

- **What** specific object(s) has the deviation?



- **What** is the specific deviation? - **bites on the neck**



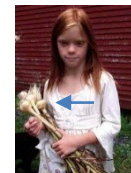
Example for **Is** :

1. Nice young girl's neck and strange look of anemic person



## Is Not

- What similar object(s) could have the deviation, **but does not? (It did not happen)**



česnek

**What** could the specific deviation? **but does not? (It did not happen) – bites=stigma, anemia**

Example of **Is Not** :

1. Girl with garlic in her hands
2. No bites
3. Healthy



# Another example for **What IS** and **What IS NOT** as well as **Where IS** and **Where IS NOT**

**IS** girl Sarah visited Dracula lower castle without a bunch of garlic, but **IS NOT** not the one (Emily) having bunch of garlic and visiting Špilberk castle in Brno



Dracula Castle  
(Where IS)



Špilberk Brno  
(Where IS NOT)



Sarah  
(What IS)



Emily  
(What IS NOT)

# Problem Analysis - Where

## Is

- Where is the object when the deviation is observed? (geographically)
- Where is the deviation on the object?

Example for **Is** :

1. Old castle in the mountains (Romania)

**Where IS** : Romanian Carpathian mountains where **it is** very easy to meet a lot of vampires there

## Is Not

- Where else could the object be when the deviation is observed, **but is not?**
- Where else could the deviation be located on the object, **but is not?**

Example for **Is Not**

1. Brno castle Špilberk

Where **IS NOT** possible to meet vampires (only lovers and children and seniors)

# Analýza problému a potvrzení pravé příčiny jeho vzniku

- Co lze udělat pro ověření všech možných příčin?
- Jak lze tyto příčiny modelovat při reálných procesech?
- Jak můžeme demonstrovat vztah příčiny a následku (CRT nebo FBD ?)
- Když budou přijata nápravná opatření, jak budou výsledky těchto akcí kontrolovány (měřeny)?

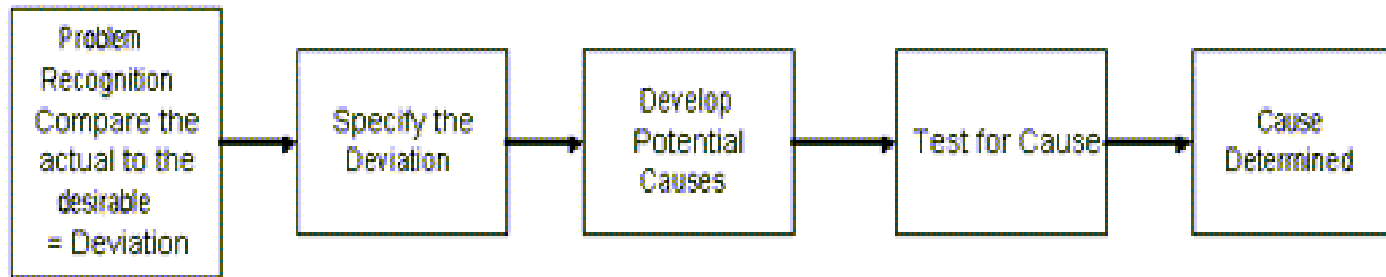


# Let's Look At Some Problems

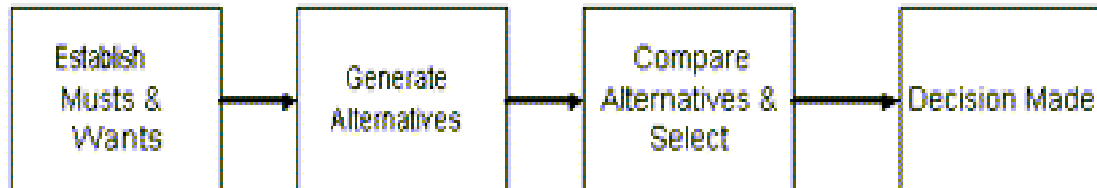
# Systematic Problem Solving

## Decision making Overview

### Problem Definition Process

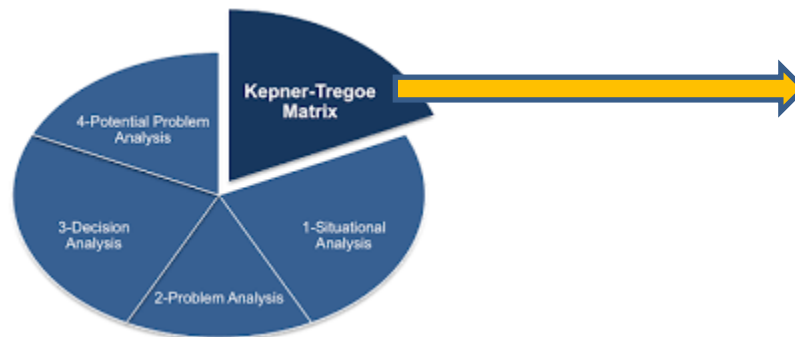


### Decision Making Process



# Planning the Next Steps

- **Problem Analysis (vždy tři otázky)**
  - Do we have a deviation?
  - Is the cause unknown?
  - Is it important to know the cause to take effective action?
- If the answer is **YES** to **ALL** three listed problems above, than you have a big problem, Huston !!!



## Problem analysis table template (Home study)

### Kepner –Tregoe matrix

		<b>IS</b>	<b>IS NOT</b>	<b>Distinction</b>	<b>Cause</b>
What	Identify:	What is problem?	What is not problem?	What difference between is and is not?	What is possible cause?
Where	Locate:	Where is problem found?	Where is problem not found?	What difference in locations?	What cause?
When	Timing:	When does problem occur?	When does problem not occur?	What difference in timing?	What cause?
		When was it first observed?	When was it last observed?	What difference between 1 <sup>st</sup> , last?	What cause?
Extent	Magnitude:	How far does problem extend?	How localized is problem?	What is the distinction?	What cause?
		How many units are affected?	How many not affected?	What is the distinction?	What cause?
		How much of any one unit is affected?	How much of any one unit is not affected?	What is the distinction?	What cause?

# Problem description (example)

On a new model of airplane, flight attendants develop rash on arms, hands, face (only those places). It only occurs on flights over water.

Usually disappears after 24 hours. No problems on old planes over those routes.

Does not affect all attendants on these flights, but same number of attendants get it on each flight. Those who get rash have no other ill effects.

No measurable chemicals, etc., in cabin air.

Rash arm ->



# Results ????



# Problem analysis real table

Distinction=Difference

	<b>IS</b>	<b>IS NOT</b>	<b>DISTINCTION</b>
WHAT:	Rash	Other illness	External contact
WHEN:	New planes used	Old planes used	Different materials
WHERE:	Flights over water	Flights over land	Different crew procedures
EXTENT:	Face, hands, arms	Other parts	Something contacting face, hands and arms
	Only some attendants	All attendants	Crew duties



# Problém s rychlosti připojení

	Is	Is Not	Differences	Changes
What	Remote access running slowly	Local access	Use of WAN	
Where	In Germany	In other countries	Different WAN links and routers	
When	All the time  Since 20-Jan	At particular times or days.  Before 20-Jan		Firmware on German routers had a security patch on 20-Jan
Extent	All transactions take about twice normal time	More than twice normal time.  Complete failure.		

# Stále jsou přijímány nesprávné telefonáty

## Is/Is Not Analysis

**Problem Statement** – Incorrect telephone calls are constantly being received

	<b>Is</b>	<b><u>Is Not</u></b>	<b><u>Therefore</u></b>
<b>Where</b>	In the sales section of the Dept	In the purchasing section of the Dept	Applicable to Sales only.
<b>When</b>	Late afternoon – usually post 4pm	Before 4pm	Only happens after 4pm
<b>What (Kind)</b>	Internal calls	External calls	Must be caused by an internal Dept.
<b>How (Much)</b>	5 calls per day	95 calls per day	Only small number of total calls received
<b>Who</b>	Finance Dept	Other Departments	Incorrect Directory being used by Finance

**The analysis Identified** – The Evening Shift staff in Finance had incorrect pages in their phone directory

# WORLD CUP & QUALITY MANAGEMENT

SAMUEL K. M. HO

**Keywords:** Quality Management, World Cup, problem solving

**Abstract:** In the semi-final World Cup 1990, England lost to West Germany in the penalty shootout. The Italian team had similar experience when they lost to Brazil in the World Cup final 1994. History repeats itself -- in WC'98, England lost to Argentina and Italy lost to France by the same mistakes. In an attempt to audit the defeats, the author developed the S-H Method of managerial auditing and used the World Cup match examples to illustrate the significance of the S-H Method in auditing managerial processes.

**Author:** prof. Samuel K.M Ho, School of Business, Hong Kong Baptist University, Hong Kong

**Rule #1:** In a successful penalty-shoot, the ball ends up in the goal away from the goal-keeper's reach. The most likely positions are those along the inside edges of the goal-posts, the higher the better, provided that the ball does not go over the bar. The football player must target these points.

**Rule #2:** The shooter should assume that there is nobody at all in the field, and concentrate on shooting the ball into the positions defined as the best.

ENGLAND			WEST GERMANY		
Goal	Player	Result & Analysis	Goal	Player	Result
E1	Lineker	In	W1	Brehme	In
E2	Beardsley	In	W2	Matthaeus	In
E3	Platt	In -- despite being touched by the goal-keeper	W3	Riedle	In
E4	Pearce	Ball caught by the goal-keeper (violating Rule #1)	W4	Thon	In
E5	Waddle	Ball flew above the goal (violating Rule #2)	<b>WON</b>		

Table 1 Score Table of Penalty-shoot Knock-out -- World Cup Semi-final 1990: England vs. West Germany

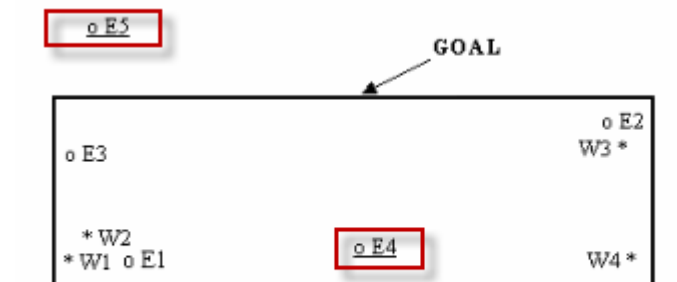


Figure 3

Approximate Positions of Penalty-shoot Goals -- World Cup Semi-final 1990: England (E) vs. West Germany (W) (Underlined balls indicate missing shoots)

K-T matice na dalším snímku

# Example of analysis

	<b>Is the problem?</b>	<b>Is as expected?</b>	<b>The point of change</b>
<b>What</b>	Weak penalty shooting	Performance during the match	Difference in penalty shoot-out tactics
<b>Who</b>	Two out of the five England players	German players	The way some players struck the ball
<b>When</b>	After 120 minutes of football	During the match	Penalty shoot-out took place after a long and tiring match
<b>Where</b>	At the points easily reached by the goalkeeper Above the bar	At the positions near the posts, inside the goal (E2 and E3)	Ball easily caught by the goalkeeper or ended up outside the goal
<b>How significant</b>	Two failures out of five attempts	The German team did not miss out of four attempts	Very significant
<b>Possible causes</b>	<ol style="list-style-type: none"> <li>1 Some players not following rule 1</li> <li>2 Certain players are incapable of shooting the ball at the right spot</li> <li>3 Some players are affected psychologically by the presence of the goalkeeper and have forgotten about rule 2</li> <li>4 Lack of proper training based on rules 1 and 2</li> </ol>		

- **WHAT** -- Lack of proper training led to the weak penalty-shooting, mostly due to players not adhering to Rule #1 (see).
- **WHO** -- A significant number of players were making the mistake as a result of insufficient training.
- **WHEN** -- When players are tired, the physical condition may affect their decision making. This is why training is important.
- **WHERE** -- More stringent training on correct shooting (Rule #1).
- **HOW SIGNIFICANT** -- The importance of the match makes the problem very significant. Therefore training must be thorough.

# Analysis in manufacturing - general approach

One problem that can be effectively addressed using the Kepner-Tregoe (KT) problem :

Solving method finds a situation where a manufacturing company is experiencing frequent **machine breakdowns** on the production line, resulting in costly downtime and decreased productivity.

Next slides demonstrate how the Kepner-Tregoe method could be applied to solve this problem:



**machine breakdown = porucha stroje**

# Situation Appraisal (SA)

The first step is to thoroughly **understand** the problem.

In this case, the problem is **frequent machine breakdowns**.

The SA step involves **gathering data** on **when breakdowns** occur, **which machines** are affected, the **nature of the breakdowns**, and the **impact on production schedules and costs**.

**Situace je nepřehledná a já se musím vyznat co se děje.**

# Problem Analysis (PA)

Once the situation is fully appraised, the next step is to analyze the problém to identify its root causes.

Using techniques like **Cause-and-Effect Analysis** or the **Five Whys**, the team can go deeper into why the breakdowns are occurring.

Possible causes could include **lack of preventive maintenance**, **aging equipment**, **operator error**, or **quality issues with spare parts**.

V podstatě něco nefunguje tak jak má, takže musím najít příčiny.

A taky ke všem aktivitám, které spadají do všech vyjmenovávaných kategorií musím přiřadit priority. To je klíčové.

Jde o nežádoucí odchylku od standardního stavu. Proč dojde k odchylce? Musí se najít příčina. Jde jinými slovy o **Root-Cause-Analýzu**.

<https://kepner-tregoe.cz/2020/08/03/analyza-problemu/>



# Decision Analysis (DA)

With a clear understanding of the **root causes**, the team can **brainstorm** and evaluate potential solutions to address the problem.

This step involves considering various options and weighing their **pros and cons** based on factors such as effectiveness, cost, feasibility, and potential risks.

Possible solutions could include implementing a **preventive maintenance program**, upgrading equipment, providing additional training for operators, or sourcing higher-quality replacement parts.

Musím se rozhodnout jak mám nalezený problém řešit (varianty řešení)

<https://kepner-tregoe.cz/2020/08/04/rozhodovaci-analyza/>

# Potential Problem Analysis (PPA)

After selecting the **best solution**, the team anticipates potential obstacles or risks that could arise during implementation.

PPA involves identifying these potential problems and developing contingency plans to mitigate them.

For example, if the chosen solution is to implement a preventive maintenance program, potential problems could include resistance from maintenance staff or difficulty sourcing spare parts.

Contingency plans could involve providing training and incentives for maintenance staff or establishing relationships with multiple suppliers.

Jak mám problém implementovat, tedy překonat překážky, které budou zavedení „zlepšení“ stát v cestě a těch překážek je vždy hodně

[\(177\) Rapid Problem Analysis - YouTube](#)

Viz další snímek s  
vazbou na to, co  
manažer na letišti řeší

**Vysvětlení co je to transposer, o kterém se ve videu mluví**

<https://technicpack.fandom.com/wiki/Transposer>



# Transposer functions

In the context of manufacturing, a transposer could refer to a piece of equipment or a process that serves to transfer or transpose materials, components, or information from one form or location to another within the manufacturing process. Here are some potential functions or applications of a transposer in manufacturing:

**1. Material Handling:** Transposers may be used to move raw materials, work-in-progress components, or finished products between different stages of the manufacturing process. This could involve conveyor systems, robotic arms, or other automated equipment.

**2. Positioning and Orientation:** Transposers might also be utilized to position or orientate components or materials in a specific manner required for subsequent manufacturing steps. This could involve rotating, flipping, or aligning parts as needed.

**3. Sorting and Segregation:** Transposers may be employed to sort or segregate items based on certain criteria such as size, shape, quality, or destination. This could involve sorting items onto different conveyor lines or into specific bins or containers.

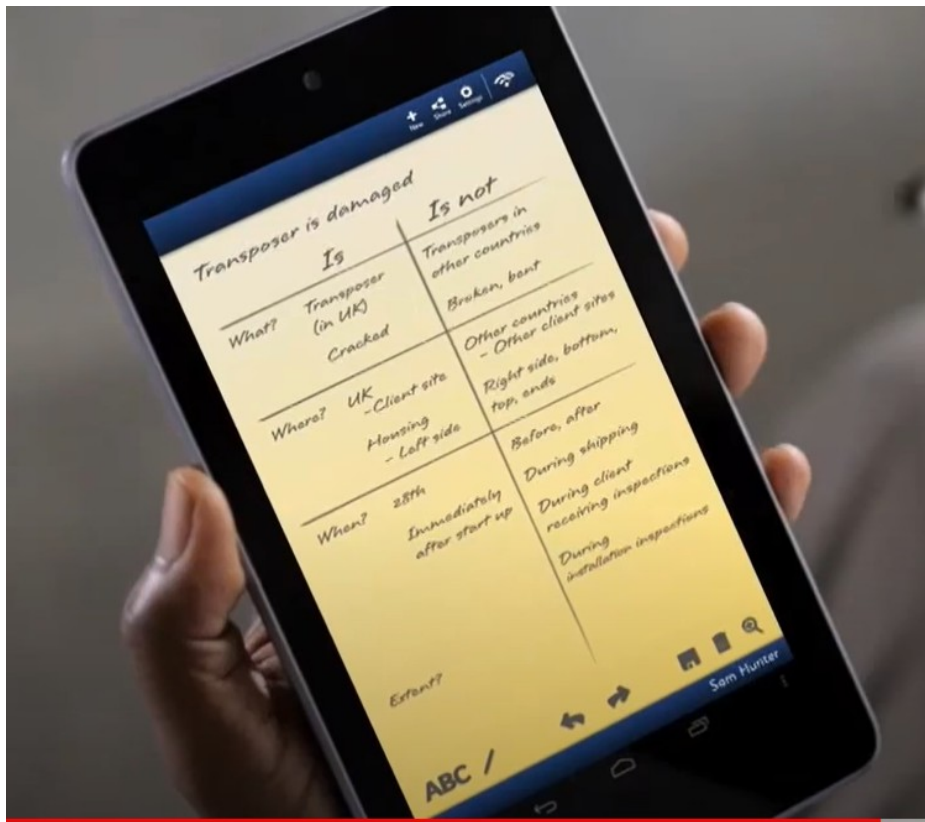
**4. Assembly Line Integration:** In assembly line manufacturing, transposers could facilitate the smooth flow of components between different workstations or assembly stations. They might ensure that each workstation receives the correct parts in the required sequence.

**5. Data Transposition:** In a more digital context, transposers could involve software systems or algorithms that transform data from one format or structure to another. This could be useful for integrating data from different sources or systems within the manufacturing environment.

**6. Adaptation to Variability:** Transposers may be employed to adapt manufacturing processes to accommodate variability in materials, product specifications, or production requirements. This could involve adjusting parameters such as speed, timing, or configuration based on real-time feedback or changing conditions.

**7. Quality Control and Inspection:** Transposers might also play a role in quality control and inspection processes by transferring items to inspection stations or testing equipment for quality assessment. They could facilitate the movement of defective items for rework or disposal.

Overall, the functions of a transposer in manufacturing are aimed at improving efficiency, consistency, and flexibility in the production process, ultimately contributing to higher productivity and product quality.



Transposer is damaged		
	Is	Is not
What?	Transposer (in UK) Cracked	Transposers in other countries Broken, bent
Where?	UK - Client site Housing - Left side	Other countries - Other client sites Right side, bottom, top, ends
When?	28th Immediately after start up	Before, after During shipping During client receiving inspections During installation inspections
Extent?	1 transposer 1 crack	

Dohlédněte prosím toto video až do konce! Je tam uvedeno elegantní řešení !!

**Transposer** = zařízení na přemísťování, **Cracked** – popraskaný, **Broken** = zlomený, **Bent**- ohnutý.

V Extent oblasti chybí velikost prasklin na **Transposeru** (1,5 cm).

Výsledek je ten, že tato závada nebude příčinou **přerušení výroby** (důležitý text v čase 5:00 minut od začátku prezentace na letišti).

Pokud by jednalo o problémy z materiálem, ze kterého byl **Transposer** vyroben, pak by to muselo být všude. Stejně tak je to s problémy při dopravě, při které je **Transposer** používán.

Takže někdo na straně zákazníka **Transposer** nesprávně používal (při jeho instalaci nebo v průběhu operace se tímto zařízením) a to dne 28.x

# Thanks for Your attention

