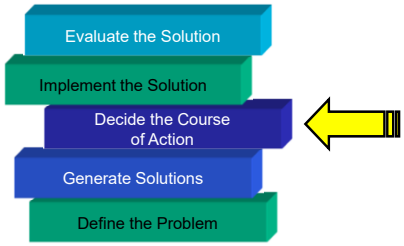
Deciding the Course of Action

- Problem solvers must juggle priorities all the time



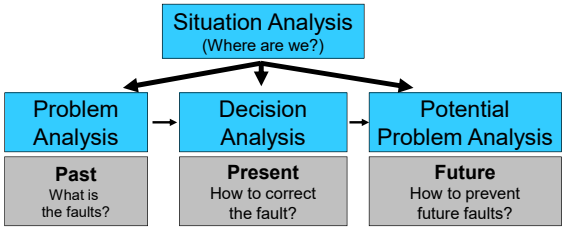
Deciding the Course of Action

- Once the real problem is defined and you have generated a number of possible solutions, it time to make some decisions:
  - Decide which problem to work on first
  - Choose the best alternative solution
  - Decide how to successfully implement the solution

Deciding the Course of Action

- An Organizational Approach for Decision Making

KT Approach (Kepner–Tregoe Approach)



KT Situation Analysis

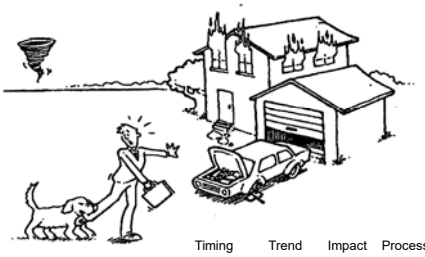
- KT Situation Analysis can be helpful in deciding which problem receives the highest priority
- Measure each problem using the following criteria:
  - Timing
  - Trend
  - Impact
- Each of the criteria are evaluated for there degree of concern
  - High (H)
  - Medium (M)
  - Low (L)

Evaluation Criteria

- **Timing**
  - How urgent is the Problem?
  - Is a deadline involved?
  - What will happen if nothing is done?
- **Trend**
  - Will the problem get worst?
  - Problem's potential for growth?
- **Impact**
  - How serous is the problem?
  - What are the effects on people, products, organization, etc.?



You know it's a really bad day when . . .



	Timing	Trend	Impact	Process
Get dog off leg	H	H	H	DA
Repair car	L	L	M	PA
Put out fire	H	H	H	DA
Ensure papers in briefcase will not be destroyed	M	M	H	PPA
Prepare for tornado	M	H	H	DA

Pareto Analysis and Diagram

- When there is more than one problem to deal with, a **Pareto Analysis** can be helpful for deciding which problem to attack first
- The ***Pareto Principle***:
  80% of the trouble comes from 20% of the problems

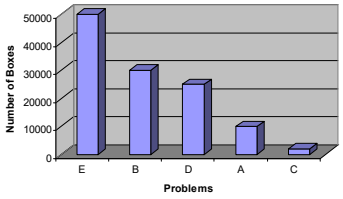
Pareto Analysis and Diagram

A Toasty O's plant is having some problems with their product:

Problem	Number of boxes
A. Inferior printing on boxes	10,000
B. Overfilling of boxes	30,000
C. Boxes damages during shipping	2,000
D. Inner wrapper not sealed	25,000
E. No prize in box	50,000

Pareto Analysis and Diagram

The original data sorted by the frequency of the number of boxes affected



On first look the Toasty O's plant would attack the problem in E-B-D-A-C order --- **No prize in box**

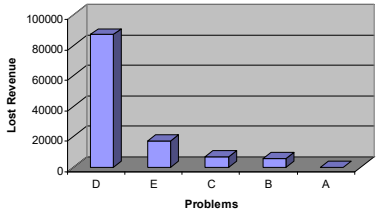
Pareto Analysis and Diagram

Let's look at the Toasty O's data when lost revenue is considered

Problem	Number of boxes
A. Inferior printing on boxes	10,000/$100
B. Overfilling of boxes	30,000/$6,000
C. Boxes damages during shipping	2,000/$7,000
D. Inner wrapper not sealed	25,000/$87,000
E. No prize in box	50,000/$17,500

Pareto Analysis and Diagram

Data sorted by lost revenue



Toasty O's plant would attack the problem in D-E-C-B-A order
Inner wrapper not sealed

Group Problem

Situation Analysis Group Problem

"The Exxon Valdez"
page 170

Group Problem

It is 12:45 AM in the morning, March 24, 1989; you have just been alerted that the Exxon Valdez tanker has run aground on the Bligh Reef and is spilling oil at an enormous rate. By the time you arrive at the spill, 6 million gallons of oil have been lost and the oil slick extends well over a square mile.
A meeting with the emergency response team is called. At the meeting it is suggested that a second tanker be dispatched to remove the remaining oil from the Exxon Valdez. However, the number of damaged compartments from which oil is leaking is not known at this time and there is concern that if the tanker slips off the reef, it could capsize if the oil is only removed from the compartments on the damaged side.
The use of chemical dispersants (i.e., soap-like substances) which would break up the oil into drops and cause it to sink is suggested. However, it is not known if there is sufficient chemical available for a spill of this magnitude. The marine biologist at the meeting objected to the use of dispersants, stating that once these chemicals are in the water, they would be taken up by the fish and thus be extremely detrimental to the fish industry.
The use of floatable booms to surround and contain the oil also brought about a heated discussion. Because of the spill size, there is not enough boom material even to begin to surround the slick. The Alaskan governor's office says the available material should be used to surround the shore of a small village on a nearby island. The Coast Guard argues that the slick is not moving in that direction and should be used to contain or channel the slick movement in the fjord. The Department of Wildlife says the first priority is the four fisheries that must be protected by the boom or the fishing industry will be depressed for years, perhaps generations to come. A related issue is that millions of fish were scheduled to be released from the fisheries into the oil contaminated fjord two weeks from now. Other suggestions as to where to place the boom material were also put forth at the meeting.

Group Problem

Major Concerns	Sub-Concerns	Timing	Trend	Impact	Process
Prevent more oil from spilling (remove remaining oil)	Number of damaged Compartments	L	L	M	DA
	Tanker slipping off reef and capsizing	M	H	H	PPA
Dispersing spilled oil	Environmental concerns	H	H	H	DA
	Availability of chemicals	H	L	M	PA
Containing oil spill	Availability of floating booms	H	H	H	PA
	Channel slick in fjord	H	H	H	DA
	Protecting island shore	L	M	L	DA
	Protecting fisheries	H	H	H	DA

Group Problem

Situation Analysis Group Problem

"The Adams Family"

Group Problem

The four members of the Adams family live east of Memphis in a middle-class community. Tom Adams commutes to work in downtown Memphis; his commute is 45 miles each way, and he is not in a car or van pool. Tom has been thinking about looking for a job closer to his home. However, he has been working for more than a year on a project that, if successfully completed, could lead to a major promotion at his current company. Unfortunately, there is a major defect in the product; this error has yet to be located and corrected. Tom must solve the problem in the very near future because the delivery date promised to potential customers is a month away.

Tom's financial security is heavily dependent on this promotion because of rising costs at home. Both of the Adams children need braces for their teeth, Tom needs a new car (it broke down twice on the freeway this past fall), the house is in need of painting, and there is a water leak in the basement that he has not been able to repair.

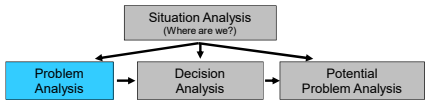
Sarah, Tom's wife, is a civil engineer. She has been considering getting a part-time job, but there are no engineering jobs available in the community. Full-time positions are available in Memphis, but accepting one would pose major problems with respect to chauffeuring and managing the children. There are a few day-care centers in the community, but rumor has it they are very substandard. In addition, last year the Adams's son Alex was accepted as a new student by the premier piano teacher in the area and there is no public transportation from their home to his studio. Melissa, the Adams's daughter, is very sad at the thought of giving up her YMCA swimming team and her Girl Scout troop, both of which meet after school.

Carry out a K. T. situation appraisal for the Adams family's predicament.

Group Problem

Major Concerns	Sub-Concerns	Timing	Trend	Impact	Process
Tom's work	Projects				
	New job				
Financial problems	Braces for kids				
	New car				
	Paint house				
	Water leak in basement				
Sara getting a job	Managing children				
	Finding part-time job				

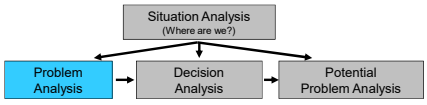
KT Problem Analysis



- Experienced problem solvers:
  - Ask the "right" questions
  - Interview as many people as necessary

- A technique used in KT Problem Analysis is:
  - Distinctions

KT Problem Analysis



- What ***is*** the problem and what ***is not*** the problem?
- Where did the problem occur? Where is everything OK?
- When did the problem first occur? When was everything OK?
- What is the magnitude of the problem?

KT Problem Analysis

- This analysis is useful in troubleshooting operations
- A good problem statement includes:
  - What is known
  - What is unknown
  - What is sought

- What ***is*** the problem and what ***is not***
- Think in terms of ***dissimilarities***
- Ask ***who, why,*** and ***how***
- Reexamine assumptions

KT Problem Analysis

		IS	IS NOT	DISTINCTION	CAUSE
What	Identify	What is the Problem?	What is not the Problem?	What is the distinc-tion between the *is* and the *is not*?	What is a possible cause?
Where	Locate	Where is the problem found?	Where is the problem not found?	What is distinctive about the different locations?	What is a possible cause?
When	Timing	When does the problem occur?	When does the problem not occur?	What is distinctive about the different in timing?	What is a possible cause?
		When was it first observed?	When was it last observed?	What is the distinction between these observations?	What is a possible cause?
Extent	Magnitude	How far does the problem extent?	How localized is the problem?	What is the distinction?	What is a possible cause?
		How many units are affected	How many units are not affected	What is the distinction?	What is a possible cause?
		How much of any one unit is affected?	How much of any one unit is not affected?	What is the distinction?	What is a possible cause?

KT Problem Analysis

- A new model of airplane was delivered to Eastern Airlines in 1980. Soon the flight attendants developed a red rash on their arms, hands, and faces. It occurred only on flights that were over water.

Fortunately, it usually disappeared in 24 hours and caused no additional problems.

When the attendants flew other planes over the same routes, no ill effects occurred.

KT Problem Analysis

- A new model of airplane was delivered to Eastern Airlines in 1980. Soon the flight attendants developed a red rash on their arms, hands, and faces. It occurred only on flights that were over water.

The same number of attendants contacted the rash on each flight.

In addition, a few of those who contracted the rash felt ill, and the union threatened action.

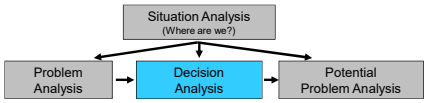
KT Problem Analysis

	IS	IS NOT	DISTINCTION
What	Rash	Other illness	External contact
When	New planes	Old planes	Different materials
Where	Flights over water	Flight over land	Different crew procedures
Extent	Only some attendants	All attendants	Crew duties

- Look at all the distinctions:

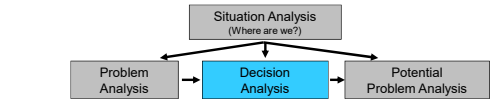
a) something contacting the arms and face
b) the rash occurs only on flights over water
c) the life vests on the new plane are made of new materials or of a different brand of materials

KT Decision Analysis



- How to choose the "***best***" solution from a number of alternatives
- Write a concise ***decision statement***
  - Collect and analysis information and data
  - Talk with people familiar with the problem
  - If possible, view the problem first hand
  - Confirm all findings

KT Decision Analysis



- Specify the objectives of the decision
- Divide these objectives into two categories:

musts

and ***wants***

KT Decision Analysis

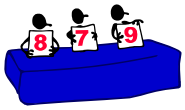
- ***Musts*** are mandatory to a successful solution
  - If a solution satisfies all ***musts*** then the solution is a "go"
  - If a solution does not satisfy any one of the ***musts*** then the solution is a "no go"

- ***Wants*** are desirable but nor mandatory

KT Decision Analysis

- Assign a ***weight*** (1 - 10) to each ***want*** on how important it is to you

- Assign a ***rating*** (0 - 10) as to how well it satisfies the ***wants***

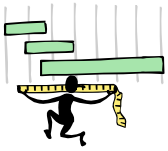


- A score for the solution can be determined by multiplying the ***rating*** by the ***weight***

KT Decision Analysis

- Assigning ***weights*** is a subjective thing

- Compare ***wants*** two at a time to help arrive at consistent assignment of ***weights***



- Assessment of ***weight*** must be consistent is the decision is to be valid

KT Decision Analysis Example

Choosing a Paint Gun . . .

A auto manufacturing plant needs to choose an electrostatic paint spray gun.

Decision Statement: Choose a paint spray gun. The available guns are:

Paint Right
New Spray
Gun Ho

KT Decision Analysis Example

Musts:
1) Control over paint flow rate
2) Acceptable paint appearance

Wants:
1) Easy service
2) Low cost
3) Long–term durability
4) Personnel with experience

KT Decision Analysis Example

MUSTS		Paint Right		New Spray		Gun Ho
Adequate flow control		Go		Go		No Go
Acceptable appearance		Go		Go		Go
WANTS	Weight	Rating	Score	Rating	Score	
Easy service	7	2	14	9	63	**No Go**
Durability	6	8	48	6	36	
Low cost	4	3	12	7	28	
Experience	4	9	36	2	8	
Total			**110**		**135**	

KT Decision Analysis Example

Risk Assessment

- Explore the risk associated with each alternative

- Evaluate the ***probability*** (0 - 10) of adverse consequences of each alternative solution

- Evaluate the ***seriousness*** (0 -10) of the consequence if it occurs

KT Decision Analysis Example

Problems with Subjective Measurements

- Giving higher weights/scores to predetermined favored projects
  - Loaded Wants
  - Unimportant details
  - Faulty perception of objectives

- Missing Information - "**What if... ?"**

- Is the decision ***ethical?***

Group Problem

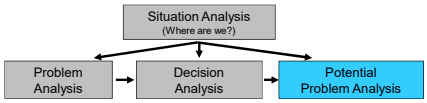
Decision Analysis Group Problem

"Choosing an Elective"
page 171

KT Decision Analysis Example

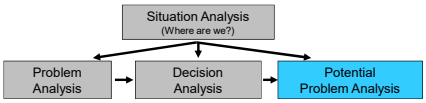
MUSTS 3 Credits Inexpensive	Music 101	Art 101	HISH 201	Art 203	GEOL 101	Music 205
WANTS Good grade Interesting Low time commitment						
Total						

KT Potential Problem Analysis



- This analysis can help decrease the possibility of a disastrous outcome
- A PPA table delineates the potential problems and suggests ***possible causes***, ***preventive actions***, and ***contingent actions***

KT Potential Problem Analysis



KT Potential Problem Analysis			
Potential Problem	Possible Causes	Preventive Actions	Contingent Actions
A.	1. 2.		
B.	1. 2.		

KT Potential Problem Analysis

- Identify how serious each problem is
- How probable is it that the problem will occur?
- **Once Problems are identified**
  - List all possible causes
  - Develop preventive actions for each cause

Group Problem

Potential Problem Analysis
"Minor Oil Spill" page 175

A minor oil spill has occurred on a small sandy resort each. The CEO of the company that caused the beach shoreline to become soiled with oil said:

"Spare no expense; use the most costly method-steam cleaning-to remove the oil from the sand."

Carry out a K. T. potential problem analysis on the direction given by the CEO.

KT Potential Problem Analysis

Potential Problem	Consequence	Probable Cause	Preventive Action	Contingent Action
No return of plant or animal life	Environmental mess – in trouble with environmental groups	Sterilized beach too much	Use less abrasive cleaning chemicals	Reintroduce life to the area
Oil becomes lodged deeper in the sand	Continued contamination of the beach	Pressure from cleaning equipment	Use lower setting	Conduct oil recovery
Contamination of water table	Illness to area residents	Improper use of equipment	Use only well trained workers with experience	Clean up the area water table

Group Problem

Potential Problem Analysis

"New Chicken Sandwich"
page 176-177

KT Potential Problem Analysis

Potential Problem	Consequence	Probable Cause	Preventive Action	Contingent Action
People don't buy sandwich	Company loses money	Too spicy	Perform taste tests	Serve sauce on side in hot/mild varieties
		Too expensive	Compare unit cost with competition	Run promotional specials
		Name scares potential customers	Take survey	Change name
Bacteria in food	Lawsuits, loss of customers	Mishandling of chicken by employees	Don't allow employees to contact raw chicken	Perform periodic inspections

End of Chapter 8