Kepner-Tregoe Methodology

Skorkovský
Department of business economy

Developed by Charles H. Kepner and Benjamin B. Tregoe in the 1960s.
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!
Decision Analysis – serious one

Sticky- lepkavý
Lick – olíznout
What is it K-T methodology?

Kepner Tregoe is used for decision making.

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

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

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

It is a step-by-step approach for systematically solving problems, making decisions, and analyzing potential risks.
Access situation (situation appraisal)

• Identify concerns (problems) by listing them
• Separate the level of concern (importance, magnitude, level of influence)
• Set the priority level to measure seriousness of impacts (influence), urgency and growth potential
• Decide what action to take next (step by step approach)
• Plan for who is involved, what they will be doing, where they will be involved, when it happened and the extent of involvement (magnitude)
Make decision  *(A choice between two or more alternatives)*

- Identify what is being decided
- Establish and classify objectives (main ones, minor ones,..)
- Separate the objectives into **must** *(must to have)* and **want** *(nice to have)* categories (we have to assign importance factors from 1-10, where 10 is the most important want objective) and assign criterion rating (weights)
- Generate the alternatives *(we can do it that way or we can take another way as well)*
- Evaluate the alternatives by scoring the **wants** against the main objective – **see next slides**
- Review adverse (harmful) consequences of your corrective steps (risk evaluation, risk assessment)
- Make the best possible choice **what to do**
Importance can be understood as a Satisfaction score, meaning desirable but not essential. Criteria rating is related to want criteria and every car property.

### Criteria rating

<table>
<thead>
<tr>
<th>“Must” Criteria</th>
<th>Car 1</th>
<th>Car 2</th>
<th>Car 3</th>
<th>Car 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost under $9,000</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Available within one week</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>“Want” Criteria</th>
<th>Importance</th>
<th>Criterion rating</th>
<th>Weighted score</th>
<th>Criterion rating</th>
<th>Weighted score</th>
<th>Criterion rating</th>
<th>Weighted score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good gas mileage</td>
<td>7</td>
<td>5</td>
<td>7 × 5 = 35</td>
<td>6</td>
<td>7 × 6 = 42</td>
<td>8</td>
<td>7 × 8 = 56</td>
</tr>
<tr>
<td>Sporty</td>
<td>8</td>
<td>5</td>
<td>8 × 5 = 40</td>
<td>7</td>
<td>8 × 7 = 56</td>
<td>4</td>
<td>8 × 4 = 32</td>
</tr>
<tr>
<td>Color (blue)</td>
<td>3</td>
<td>10</td>
<td>3 × 10 = 30</td>
<td>0</td>
<td>3 × 0 = 0</td>
<td>0</td>
<td>3 × 0 = 0</td>
</tr>
<tr>
<td>AM/FM stereo</td>
<td>5</td>
<td>7</td>
<td>5 × 7 = 35</td>
<td>8</td>
<td>5 × 8 = 40</td>
<td>3</td>
<td>5 × 3 = 15</td>
</tr>
<tr>
<td>Good condition</td>
<td>10</td>
<td>5</td>
<td>10 × 5 = 50</td>
<td>6</td>
<td>10 × 6 = 60</td>
<td>8</td>
<td>10 × 8 = 80</td>
</tr>
<tr>
<td>Low mileage</td>
<td>6</td>
<td>6</td>
<td>6 × 6 = 36</td>
<td>4</td>
<td>6 × 4 = 24</td>
<td>5</td>
<td>6 × 5 = 30</td>
</tr>
<tr>
<td>Relatively new</td>
<td>7</td>
<td>3</td>
<td>7 × 3 = 21</td>
<td>5</td>
<td>7 × 5 = 35</td>
<td>5</td>
<td>7 × 5 = 35</td>
</tr>
<tr>
<td><strong>TOTAL WEIGHTED SCORE (WS)</strong></td>
<td></td>
<td></td>
<td>247</td>
<td></td>
<td>257</td>
<td></td>
<td>248</td>
</tr>
</tbody>
</table>

See similar example on the next slide.
Which car to buy?

### MUSTS

<table>
<thead>
<tr>
<th>Feature</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Brakes</td>
<td>GO</td>
<td>GO</td>
<td>GO</td>
<td>GO</td>
</tr>
<tr>
<td>Power Steering</td>
<td>GO</td>
<td>GO</td>
<td>GO</td>
<td>GO</td>
</tr>
<tr>
<td>AM/FM Stereo</td>
<td>GO</td>
<td>GO</td>
<td>NO GO</td>
<td>GO</td>
</tr>
<tr>
<td>Automatic</td>
<td>GO</td>
<td>GO</td>
<td>NO GO</td>
<td>GO</td>
</tr>
<tr>
<td>Under $15,000</td>
<td>GO</td>
<td>GO</td>
<td>GO</td>
<td>GO</td>
</tr>
</tbody>
</table>

### WANTS

<table>
<thead>
<tr>
<th>Feature</th>
<th>Weight</th>
<th>Score</th>
<th>W x S</th>
<th>Score</th>
<th>W x S</th>
<th>Score</th>
<th>W x S</th>
<th>Score</th>
<th>W x S</th>
</tr>
</thead>
<tbody>
<tr>
<td>AirCon</td>
<td>10</td>
<td>10</td>
<td>100</td>
<td>0</td>
<td>0</td>
<td>10</td>
<td>100</td>
<td>10</td>
<td>100</td>
</tr>
<tr>
<td>Cassette</td>
<td>7</td>
<td>6</td>
<td>42</td>
<td>10</td>
<td>70</td>
<td>10</td>
<td>70</td>
<td>10</td>
<td>70</td>
</tr>
<tr>
<td>Antilock Brakes</td>
<td>9</td>
<td>0</td>
<td>0</td>
<td>10</td>
<td>90</td>
<td>10</td>
<td>90</td>
<td>10</td>
<td>90</td>
</tr>
<tr>
<td>Air Bag</td>
<td>8</td>
<td>5</td>
<td>40</td>
<td>10</td>
<td>80</td>
<td>10</td>
<td>80</td>
<td>10</td>
<td>80</td>
</tr>
<tr>
<td>Rear Demist</td>
<td>6</td>
<td>10</td>
<td>60</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Engine Size</td>
<td>6</td>
<td>8</td>
<td>48</td>
<td>6</td>
<td>36</td>
<td>6</td>
<td>36</td>
<td>6</td>
<td>36</td>
</tr>
<tr>
<td>Central Lock</td>
<td>5</td>
<td>5</td>
<td>25</td>
<td>10</td>
<td>50</td>
<td>10</td>
<td>50</td>
<td>10</td>
<td>50</td>
</tr>
<tr>
<td>Metal Paint</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>10</td>
<td>40</td>
<td>10</td>
<td>40</td>
<td>10</td>
<td>40</td>
</tr>
<tr>
<td>Warranty</td>
<td>8</td>
<td>10</td>
<td>80</td>
<td>7</td>
<td>56</td>
<td>3</td>
<td>24</td>
<td>4</td>
<td>28</td>
</tr>
<tr>
<td>Resale Value</td>
<td>7</td>
<td>7</td>
<td>49</td>
<td>7</td>
<td>49</td>
<td>7</td>
<td>49</td>
<td>7</td>
<td>49</td>
</tr>
</tbody>
</table>

**TOTALS:**

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>444</td>
<td>471</td>
<td>387</td>
<td></td>
</tr>
</tbody>
</table>

Importance score, meaning desirable but not essential.

go to slide 34 and back
See the Upcoming (approaching, next to come) and Potential Opportunity -Solutions

• State the action
• List the potential opportunities $\mathcal{O}\{\text{op1, ..., opN}\}$
• Consider the possible solutions (e.g. the second one)
• Take the action to address the likely cause/solution
• Prepare actions to enhance likely (possible) effects
Uncover and handle problems
(problem analysis)

• State the problem (definition and description of the problem)
• Specify the problem by asking **what is** and **what is not**
• Develop **possible causes** of the problem
• Test and verify possible causes
• Determine the most probable cause (root cause)
• Verify any assumptions
• Try the best possible solution and monitor what will be a situation after applied correctives step
Description

Problem 1

Situation

Solution (corrective action) 1

Solution (corrective action) X

Problem 1'

Problem N

Situation

Description

Causes

Priority (urgency)

Solution (corrective action) 1

Solution (corrective action) Y

Problem N'

WHERE and WHERE NOT

What Where When Extent

WHERE and WHERE NOT

What Where When Extent

Big problems

Smaller problems
Decomposition, priorities and causes

Problem 1

Sub-problem 1
Sub-problem N
Priority 1
Priority N

Problem 2

Sub-problem 1
Sub-problem N
Cause 1
Cause N
Example of problem manifestation
(decrease of performance)

What do we see, hear, feel, taste, or smell that tells us there is a deviation?

Unfavourable deviation

Final effect of the change = PROBLEM (e.g. server crashed)

Then we have to ask: What, Where, When, and to what Extent – Size (how much, how many)?
Server crashed !!!! (home study !!!)

- Server crashed (this is a very poor problem definition)
- The e-mail system crashed after the 3rd shift support engineer applied hot-fix XYZ to Exchange Server 123 (better definition of the problem)

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

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

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)

<table>
<thead>
<tr>
<th>Potential root cause:</th>
<th>True if:</th>
<th>Probable root cause?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exchange Server 123 has something wrong with it</td>
<td>Only Exchange Server 123 has this problem</td>
<td>Maybe</td>
</tr>
<tr>
<td>Procedure incorrect</td>
<td>Same procedure crashes another server</td>
<td>Probably</td>
</tr>
<tr>
<td>Technician error</td>
<td>Problem did not always reoccur</td>
<td>Probably not</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Question</th>
<th>IS</th>
<th>IS NOT</th>
</tr>
</thead>
<tbody>
<tr>
<td>What (identify)</td>
<td>Q1</td>
<td>Q2</td>
</tr>
<tr>
<td>Where (locate)</td>
<td>Q3</td>
<td>Q4</td>
</tr>
<tr>
<td>When (timing)</td>
<td>Q5</td>
<td>Q6</td>
</tr>
<tr>
<td>Extent (magnitude)</td>
<td>Q7</td>
<td>Q8</td>
</tr>
</tbody>
</table>
Problem Analysis - **What**

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

**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:**
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 it dose not work

**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)?

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)
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

Example of Is Not:
1. Girl with garlic in her hands
2. No bites
3. Zaftig
Another example for **WHAT** and **IS** and **IS NOT**

**Example I.**
Customer X and Customer Y both use product B but only customer X was sent the wrong product so the object **IS** Customer X, but **IS NOT** Customer Y.

**Example II.**
**IS** girl visited Dracula lower castle without a bunch of garlic, but **IS NOT** not the one having bunch of garlic and visiting Špiberk castle in Brno.
Problem Analysis - **Where**

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

**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:**
1. Old castle in the mountains (Romania)

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

**Example for Is Not**
1. Brno castle Spilberk

Where **IS NOT** possible to meet vampires (only lovers and children and seniors)
Problem Analysis - When

**Is**
- When was the deviation observed first (clock and calendar time)?
- When since that time has the deviation been observed?
- When, in the object’s history or life cycle, was the deviation observed first?

**Is Not**
- When else could the deviation have been observed first, but was not?
- When since that time could the deviation have been observed, but was not?
- When else, in the object’s history or life cycle, could the deviation have been observed first, but was not?

See example next slide
Example for **WHEN** and **IS** and **IS NOT**

Customer X and Customer Y both use product B but only customer X was sent the wrong product if Salesman Tony was on holiday in this time and Salesman Mustafa was in charge, so the object **IS** Salesman Mustafa, but **IS NOT** Salesman Tony.
Problem Analysis - **Extent**

<table>
<thead>
<tr>
<th>Is</th>
<th>Is Not</th>
</tr>
</thead>
<tbody>
<tr>
<td>• How many objects have the deviation?</td>
<td>• How many objects could have the deviation, <em>but don’t</em>?</td>
</tr>
<tr>
<td>• What is the size of a single deviation?</td>
<td>• What other size could a deviation be, <em>but isn’t</em>?</td>
</tr>
<tr>
<td>• How many deviations are on each object?</td>
<td>• How many deviations could there be on each object, <em>but are not</em>?</td>
</tr>
<tr>
<td>• What is the trend?</td>
<td>• What could be the trend, <em>but isn’t</em>?</td>
</tr>
<tr>
<td>– Occurrences?</td>
<td>• Occurrences?</td>
</tr>
<tr>
<td>– Size?</td>
<td>• Size?</td>
</tr>
</tbody>
</table>
Problem Analysis
Evaluate Possible Causes

• Determine the most probable cause
  • Which possible cause best explains the IS and IS NOT information?
  • Which possible cause has the fewest, simplest, and most reasonable assumptions?
Problem Analysis

Confirm True Cause

• What can be done to verify any assumptions made?
• How can this cause be observed at work?
• How can we demonstrate the cause-and-effect relationship (e.g. Current Reality Tree or Ishikawa Fishbone Diagram)?
• When corrective action is taken, how will results be checked?
Let’s Look At Some Problems!
Systematic Problem Solving and Decision making Overview

**Problem Definition Process**
- Problem Recognition
- Compare the actual to the desirable = Deviation
  - Specify the Deviation
  - Develop Potential Causes
  - Test for Cause
  - Cause Determined

**Decision Making Process**
- Establish Musts & Wants
  - Generate Alternatives
  - Compare Alternatives & Select
  - Decision Made
Planning the Next Steps

• Problem Analysis
  • 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, than you have a big problem, Huston !!!
# Problem analysis table template

**Home study**

<table>
<thead>
<tr>
<th></th>
<th>IS</th>
<th>IS NOT</th>
<th>Distinction</th>
<th>Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>What</td>
<td>Identify:</td>
<td>What is problem?</td>
<td>What is not problem?</td>
<td>What difference between is and is not?</td>
</tr>
<tr>
<td>Where</td>
<td>Locate:</td>
<td>Where is problem found?</td>
<td>Where is problem not found?</td>
<td>What is possible cause?</td>
</tr>
<tr>
<td>When</td>
<td>Timing:</td>
<td>When does problem occur?</td>
<td>When does problem not occur?</td>
<td>What cause?</td>
</tr>
<tr>
<td>Extent</td>
<td>Magnitude:</td>
<td>How far does problem extend?</td>
<td>How localized is problem?</td>
<td>What is the distinction?</td>
</tr>
<tr>
<td></td>
<td>How many units are affected?</td>
<td>How many not affected?</td>
<td>What is the distinction?</td>
<td>What cause?</td>
</tr>
<tr>
<td></td>
<td>How much of any one unit is affected?</td>
<td>How much of any one unit is not affected</td>
<td>What is the distinction?</td>
<td>What cause?</td>
</tr>
</tbody>
</table>
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 ->
Problem analysis real table

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

**Distinction=Difference**
Results ????
Tree of the casual relationships I – example

• Decline of revenue due to:
  • Lower merchantability of the items
    • New competitors
    • Change of the customer preferences
    • Poor (not sufficient) quality of the item
  – Restriction of capacity production
    • Downtime due to machine failure, obsolete machinery, irregular maintenance
  – Change of the legislation (change of the health rules)
Revenue decline

Decline of demand

New competitors

Change of the customer preferences

Change of the health rule

Lower production

Decrease of production capacity

Machinery downtime

Machinery is liable to breakdowns

Lower quality

...
Let’s Look At Some Problems again!

I've solved your parking problem... ...I'm taking away your company car!
Decision making process

• Problem definition
• Requirements identification
• Goal establishment
• Evaluation criteria development
• Select decision – making tool
• Apply tool (K &T, Pros-Cons,...)
• Check
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**
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)

<table>
<thead>
<tr>
<th>Criteria/Want objectives</th>
<th>Criteria Weight</th>
<th>Arrow</th>
<th>Alternative Score</th>
<th>Total Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comfort</td>
<td>5</td>
<td>86 in. rear seat leg and shoulder room, seats 5</td>
<td>6</td>
<td>30</td>
</tr>
<tr>
<td>Safety</td>
<td>10</td>
<td>14 stars</td>
<td>5</td>
<td>50</td>
</tr>
<tr>
<td>Fuel efficiency</td>
<td>7</td>
<td>21 mpg</td>
<td>9</td>
<td>63</td>
</tr>
<tr>
<td>Reliability</td>
<td>9</td>
<td>80</td>
<td>9</td>
<td>81</td>
</tr>
<tr>
<td>Cost</td>
<td>10</td>
<td>$26,000</td>
<td>5</td>
<td>50</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td>274</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Baton</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Comfort</td>
<td>5</td>
<td>88 in. rear seat leg and shoulder room, seats 6</td>
<td>9</td>
<td>45</td>
</tr>
<tr>
<td>Safety</td>
<td>10</td>
<td>17 stars</td>
<td>8</td>
<td>80</td>
</tr>
<tr>
<td>Fuel efficiency</td>
<td>7</td>
<td>19 mpg</td>
<td>8</td>
<td>56</td>
</tr>
<tr>
<td>Reliability</td>
<td>9</td>
<td>70</td>
<td>7</td>
<td>63</td>
</tr>
<tr>
<td>Cost</td>
<td>10</td>
<td>$21,000</td>
<td>8</td>
<td>80</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td>324</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Carefree</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Comfort</td>
<td>5</td>
<td>80 in. rear seat leg and shoulder room, seats 5</td>
<td>4</td>
<td>20</td>
</tr>
<tr>
<td>Safety</td>
<td>10</td>
<td>15 stars</td>
<td>6</td>
<td>60</td>
</tr>
<tr>
<td>Fuel efficiency</td>
<td>7</td>
<td>22 mpg</td>
<td>10</td>
<td>70</td>
</tr>
<tr>
<td>Reliability</td>
<td>9</td>
<td>65</td>
<td>5</td>
<td>45</td>
</tr>
<tr>
<td>Cost</td>
<td>10</td>
<td>$17,000</td>
<td>10</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td>295</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dash</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Comfort</td>
<td>5</td>
<td>89 in rear seat leg and shoulder room, seats 6</td>
<td>10</td>
<td>50</td>
</tr>
<tr>
<td>Safety</td>
<td>10</td>
<td>19 stars</td>
<td>10</td>
<td>100</td>
</tr>
<tr>
<td>Fuel efficiency</td>
<td>7</td>
<td>21 mpg</td>
<td>9</td>
<td>63</td>
</tr>
<tr>
<td>Reliability</td>
<td>9</td>
<td>85</td>
<td>10</td>
<td>90</td>
</tr>
<tr>
<td>Cost</td>
<td>10</td>
<td>$24,000</td>
<td>6</td>
<td>60</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td>363</td>
</tr>
</tbody>
</table>
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 !!!
Thanks for Your attention