A “How To Guide” for the Safety Exercise

EUROCONTROL ESP & Aloft Aviation
October 2010
The Challenge: Tangible vs. Intangible!

• Incorporate the impact (importance and influence) of many different factors and elements into a decision.

• Determine a quantifiable value of intangible elements to determine their influence or importance to the overall decision.

• AHP Methodology: Allows for the mathematical measurement of the psychology of human judgment—both individually and as a group.
A Look At “Old” vs. “New” Data Displays Here, The “Classic” Data Presentation

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Can We Really Measure Total Organizational Change?
An Example Of The “New” Data Display Methodology
From Trending to Diagnostics & Drill Down: How the APF Presents Selected Raw Data
Display of Airline Data (Developmental Data)
US Navy ORMAS Risk Tool: Based on APF Concepts
Current EUROCONTROL Mindmap

Note The Symmetrical Shape:
~A Design Goal When Possible~
An Example Of The “New” Data Display Methodology Development
From Trending to Diagnostics & Drill Down: How the APF Presents Selected Raw Data
Intangible Elements:
You Will Meet In The Exercise-

- **Flight Efficiency for the Airlines**
- **Sector Capacity**
- **Cost / Benefit for ANSPs and Airlines**
- **Political and Social Pressures**
- **Environment**
- **Safety**
Weighting the Data Elements
The Analytic Hierarchy Process (AHP)

• Analytic Hierarchy Process:
  – Developed by Dr. Thomas Saaty to use multiple factors involved in complex decisions.
  – Used in original SALT Treaty discussions.
  – A “blend” of mathematics and the psychology of measuring intangibles.
  – Uses pair-wise comparisons.

• For additional reading go to:
The Classic AHP Example

AHP: Selecting a Leader

Goal: Choose a Leader 1.000

Criteria:
- Age .300
- Experience .400
- Education .100
- Charisma .200

Alternatives:
- Tom .325
- Dick .460
- Harry .225
Demo Of AHP Process

• Important Aspects For Selecting A Family Car (Goal)
  – Body Type (Element)
    • 2-Door (sub criteria)
    • 4-Door (sub criteria)
    • Hatchback
  – Engine Type
    • Gasoline
    • Diesel
    • Hybrid
  – Transmission Type
    • Manual Transmission
    • Automatic Transmission
  – Manufacturer Type
    • European Manufacture
    • Asian Manufacture
    • American Manufacture
Consistency vs. Inconsistency

• Consistency simply means your answers are following the same relative pattern
  – Consistency = If A>B and B>C, then A>C
  – Inconsistency = If A>B and B>C, you answer C>A

• Inconsistency can happen for a number of reasons:
  – Getting “lost” in the mindmap
  – “Clicking” in the wrong direction,
  – An unclear definition
Advanced Tips For The Exercise

• Remember the goal question.
  – Applies to the primary goal and sub-set elements

• Go with your instinct!!! Shoot from the hip!!!
  – Don’t think and debate with yourself! Depend on your experience!
  – If you ponder, you are instead assessing specific events, not taking a system-wide view.

• Understand “Inconsistency” but don’t drive yourself crazy

• Enjoy the post-exercise discussion!
  – This is not designed to make someone change their mind. It’s designed to make sure everyone understands the factors.
Post Weighting Exercise Discussion - A Critical Element

- Group review & discussion
- Assess and understand conclusions
The Results - A New Data Display Methodology, The APF!
Now, Let’s Select A Family Car...

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