

AHP

- Pros and Cons
- Practical Application

ANP

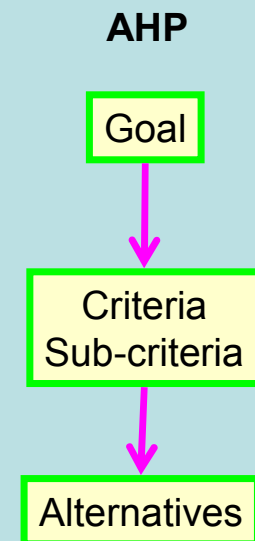
- Pros and Cons
- Setting up a network model

AHP or ANP?

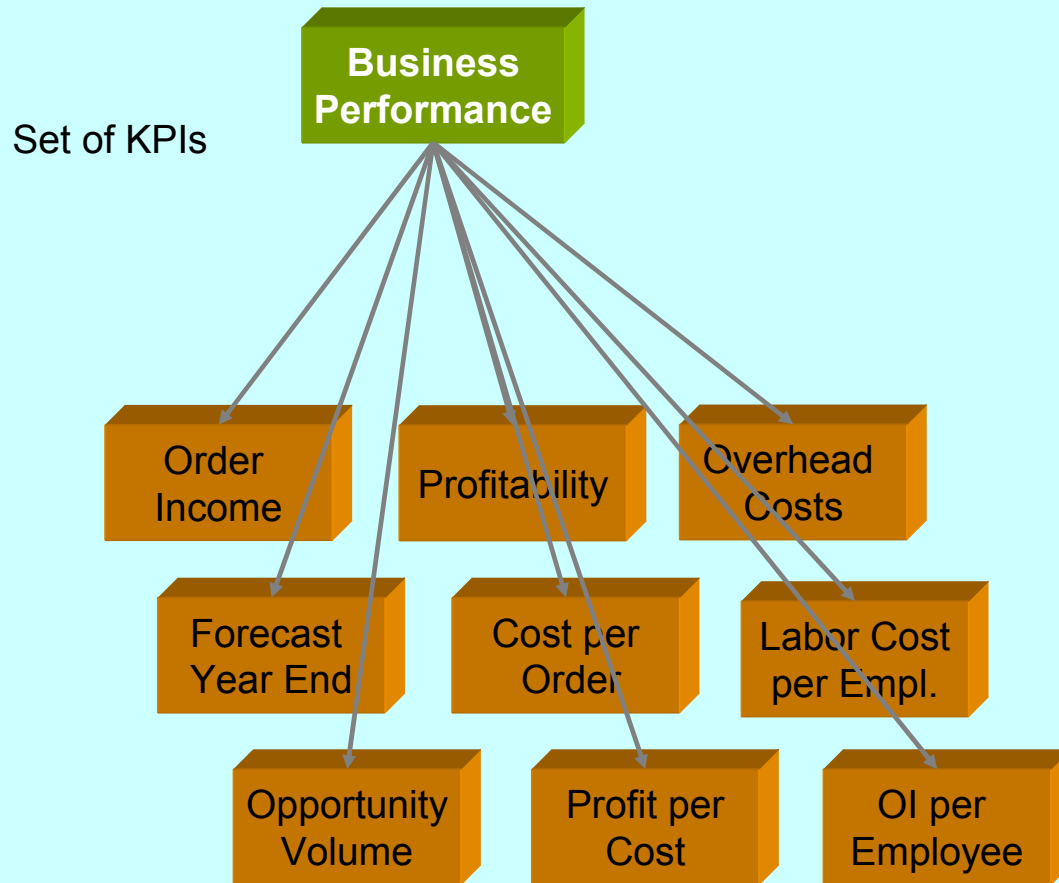
AHP/ANP application

by Klaus D Goepel
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AHP



Hierarchical Structuring of a decision problems

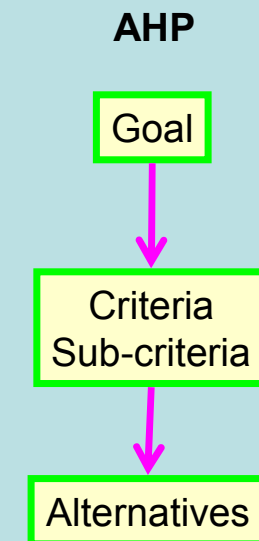


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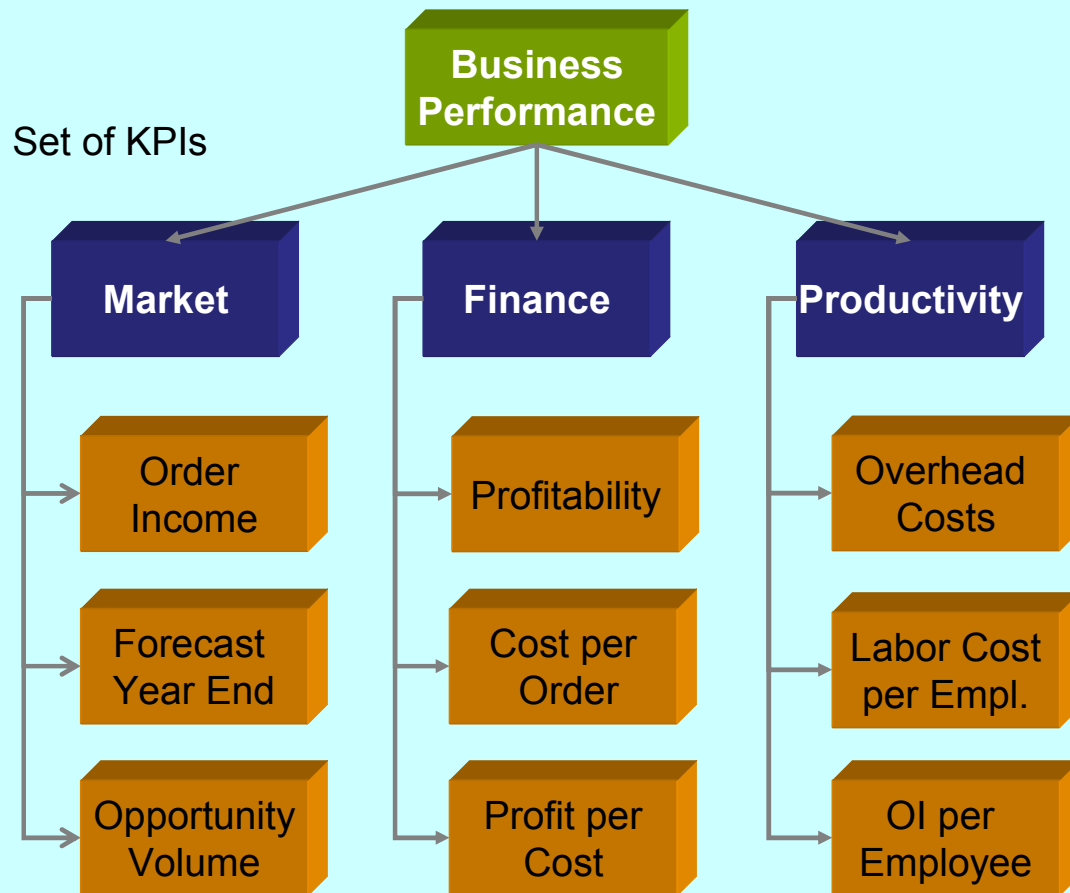
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AHP Pros and Cons

Hierarchical Structuring



Hierarchical Structuring of a decision problems

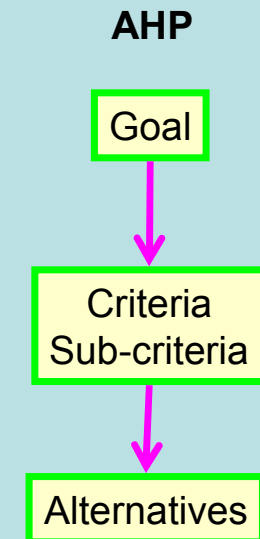


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AHP Pros and Cons

Hierarchical Structuring





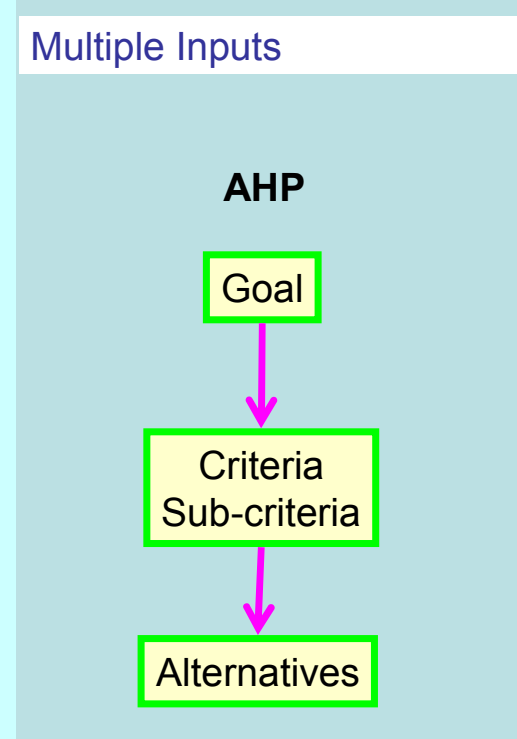
Hierarchical Structuring of a decision problems

Combining multiple inputs from several persons to a consolidated outcome

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AHP Pros and Cons



Multiple Input

1	1/2	
	1	
		1

Consolidated AHP Input Matrix

$$[1/2 * 1 * 1/4 * 1/2]^{1/4} = 1/2$$

geometric mean

Participant 1

1	1/2	4
2	1	1
1/4	1	1

Participant 2

1	1	3
1	1	2
1/3	1/2	1

Participant 3

1	1/4	2
4	1	2
1/2	1/2	1

Participant 4

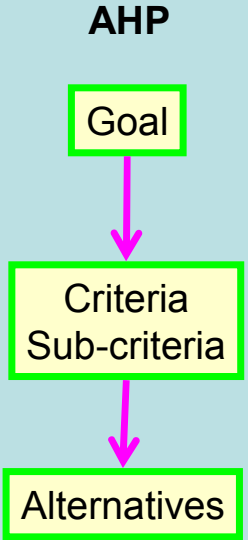
1	1/2	3
2	1	3
1/3	1/3	1

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AHP Pros and Cons

Multiple Inputs



AHP



Hierarchical Structuring of a decision problems

Combining multiple inputs from several persons to a consolidated outcome

Plausible results: people usually agree with the out coming priorities.

Calculation of results possible using Excel sheet

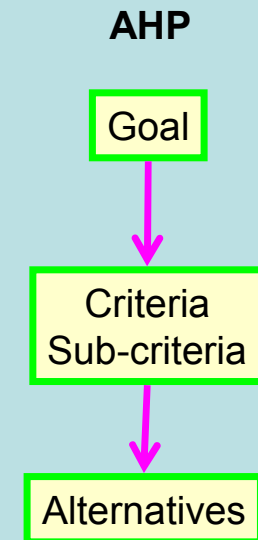
Pair-wise comparison is a quite artificial way of comparing a set of items

If consistency index above 10%:problems to explain the request to reconsider inputs

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AHP Pros and Cons



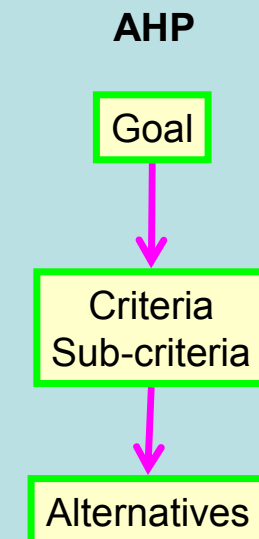
Analytic Hierarchy Process AHP

- a When using AHP: Try to structure the model in groups of max. 4-5 criteria or sub-criteria. If possible introduce additional hierarchical levels
- b Spend time to explain the use of the scale for pair wise comparisons to participants without knowledge of AHP; ask them to use the whole range of the scale 1-9
- c Even with a consistency value above the recommended limit, the results usually reflect the correct ranking and still can be used.
- d AHP is ideal to get a consolidated result for inputs from several participants, using the geometric mean.
- e Once AHP is introduced and used as method for decision making, results are in general accepted, as the method is based on mathematics, and seen as “neutral” and objective.

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AHP Practical Application



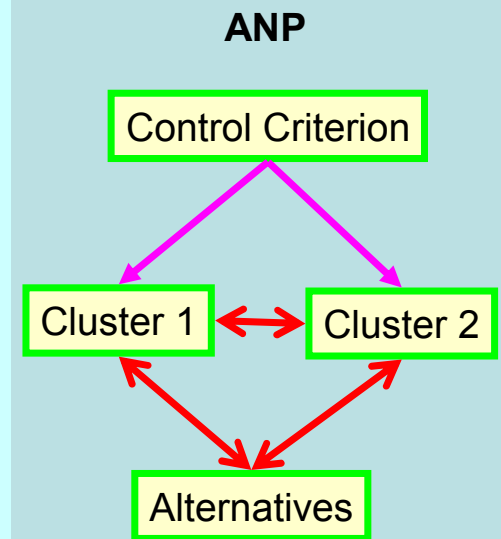
Analytical Network Process ANP



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ANP



ANP



General approach for any kind of decision problem

Some problems can only be described by ANP

Forces precise definitions of nodes and inter-connections

Ideal tool to gain deeper understanding of a specific problem and its relation to related factors

Explanation of concept & process to management extremely challenging

Requires a specific software to calculate results

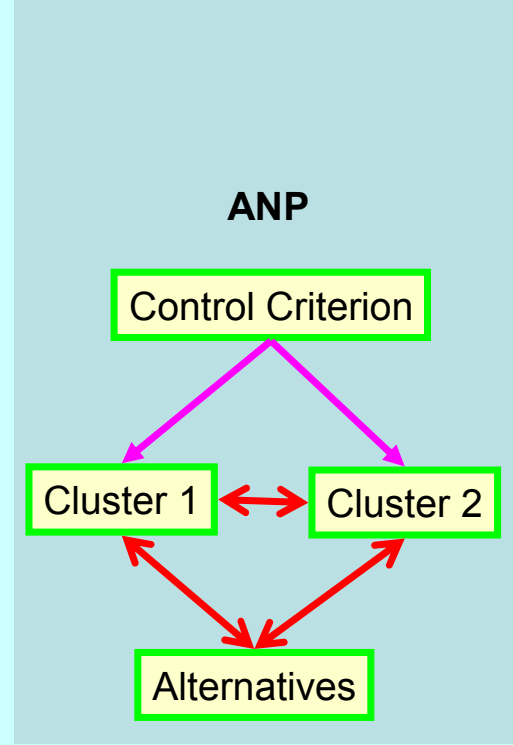
Verification of result due to feedback loops and interrelations impossible

Too complex for an implementation as standard tool for practical decision making in an organization

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ANP Pros and Cons



ANP: Setting up a model

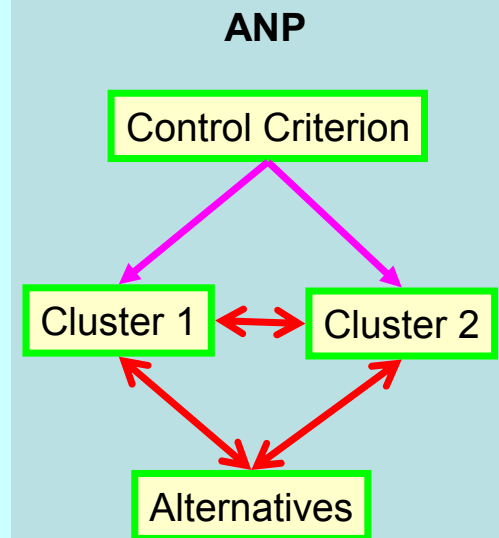
- a Careful consideration and clear description of the decision problem
- b Thorough brainstorming to find important criteria & relevant factors
- c Clarity about criteria and factors & definition of their exact meanings
- d Systematic investigation of interconnections between nodes
- e Simplification!
- f Critical assessment of out coming results

AHP and ANP can only be as good as the model description.

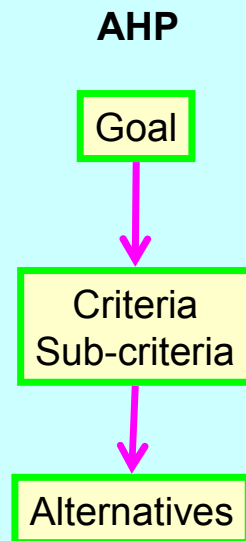
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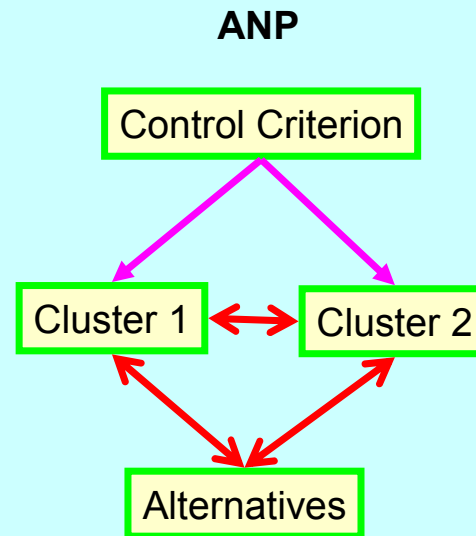
ANP Setting up a model



Analytic Hierarchy Process



Analytic Network Process



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