Problem formulation

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Cost IC0602 International Doctoral School

Applying Decision Analysis to Real Problems

University of Manchester

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Learning Objectives

1. Define what we mean by 'wicked problems'
2. Introduce a range of soft modelling techniques
3. Discuss how to use these techniques to formulate decision problems

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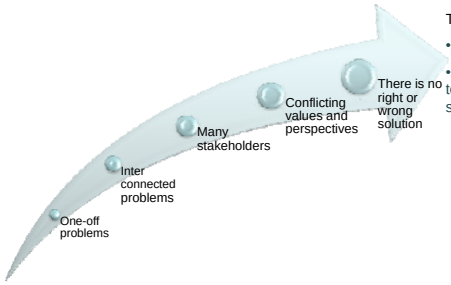
'Wicked' problems/ Messes



There are either

- no solutions or
- solutions that are perceived to be good by some, but seldom all stakeholders

(Courtney, 2001; Ackoff, 1974)

3

Building an understanding

- How can we catalyse the process of 'giving shape' to the issues and relevant data?
- How can we share and record that understanding?
- Process:
  - open brainstorming and discussion
  - focus on objectives
  - draw together issues into several perspectives and frame problem
  - build model(s) and conduct analyses.

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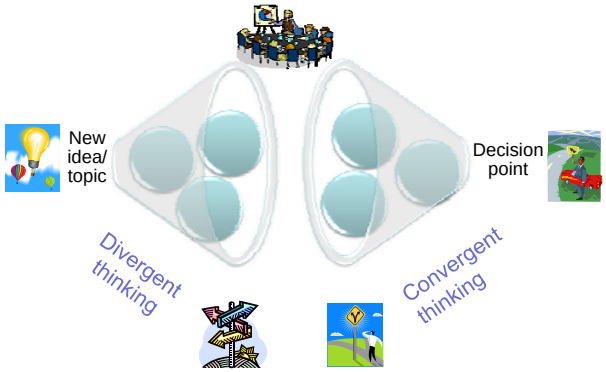
Divergent vs. convergent thinking



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Brainstorming

- Discuss issues and concerns in a group
- List uncritically all the issues
- One idea triggers another
- All ideas and contributions have equal value
- Streams of ideas are also of value
- Write up on whiteboard – or Post-its

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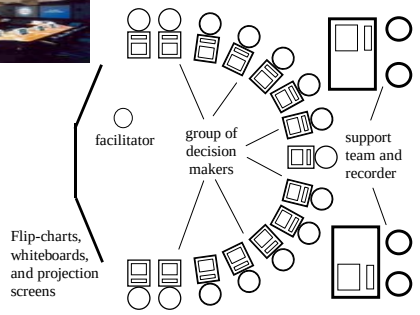
Electronic Brainstorming



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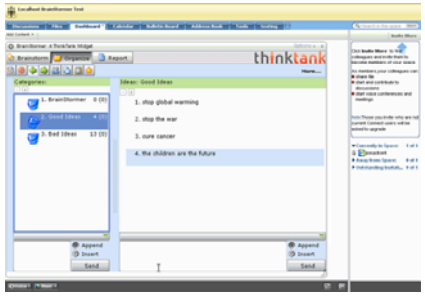
Electronic Brainstorming



http://www.groupsystems.com

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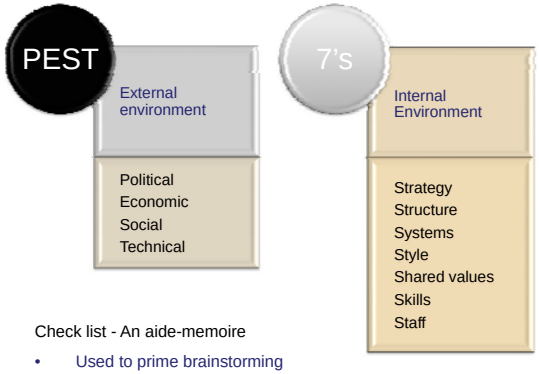
Check-lists



Check list - An aide-memoire

- Used to prime brainstorming
- Used to structure reports

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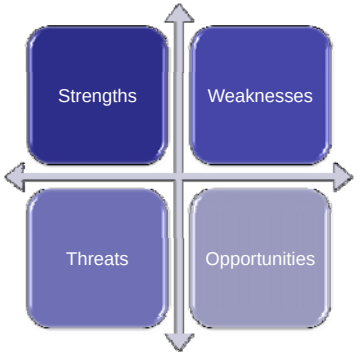
SWOT analysis



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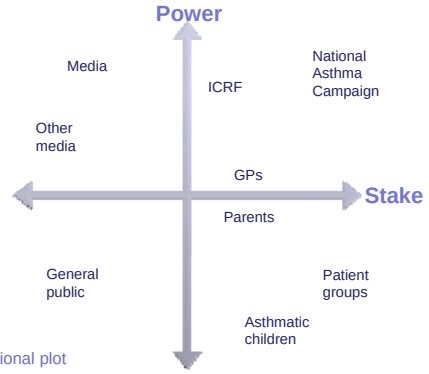
Stakeholder plot



Simple two dimensional plot

- Easy to draw on paper or flip charts
- Use of 'post-its'

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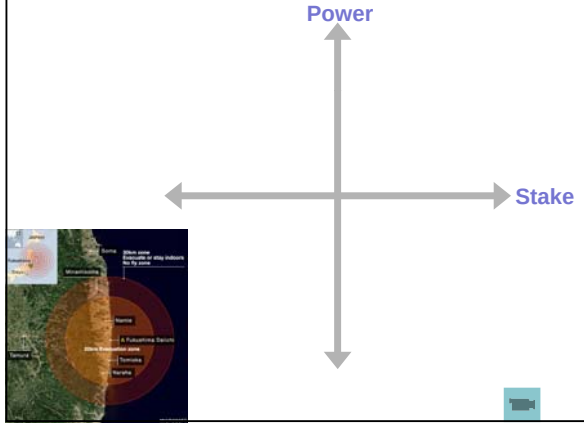
Exercise: Radiation accident in Japan



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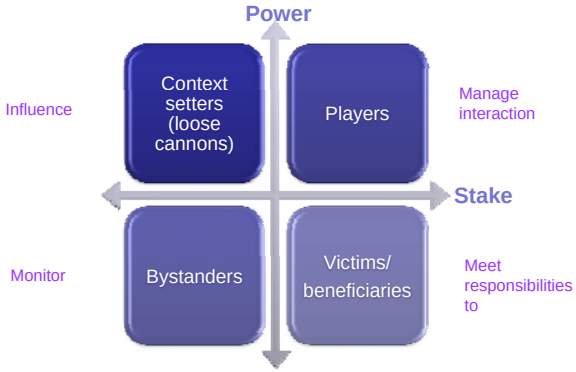
Stakeholder analysis



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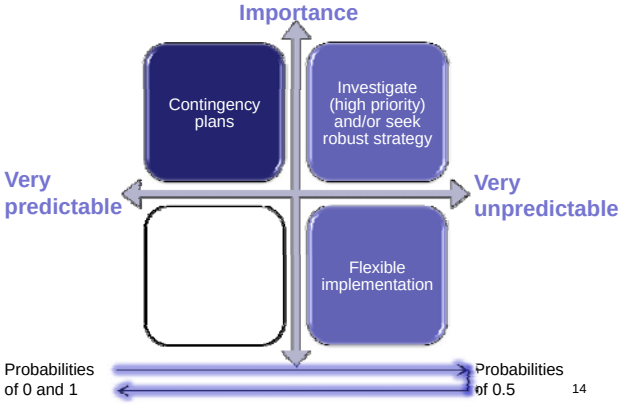
Uncertainty identification



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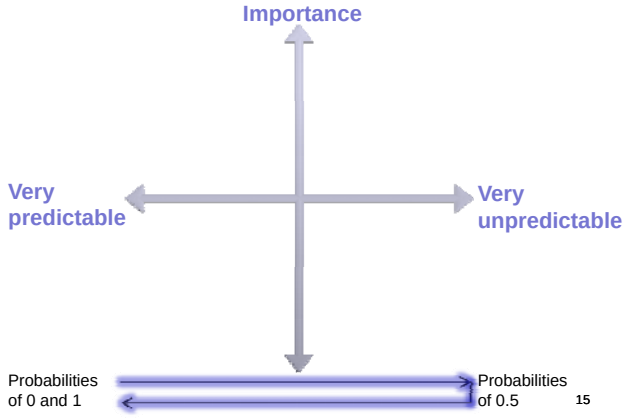
Exercise: Identifying uncertainties



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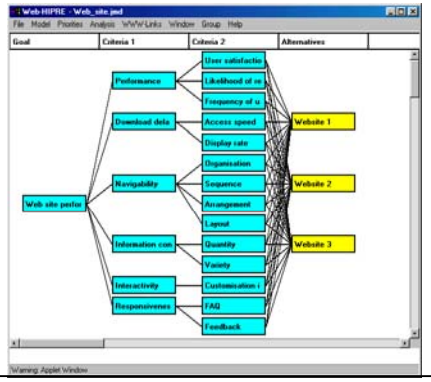
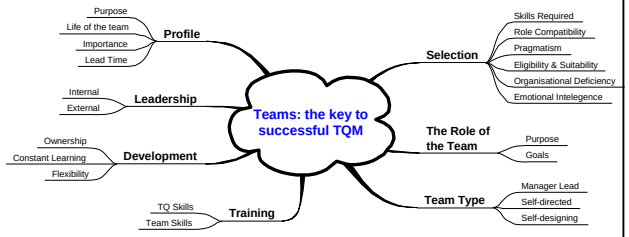
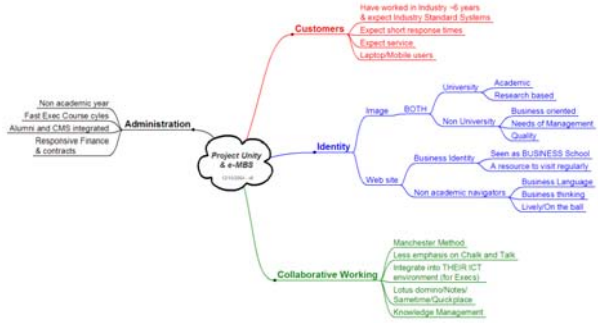
Preference Modelling:
Attribute Hierarchies



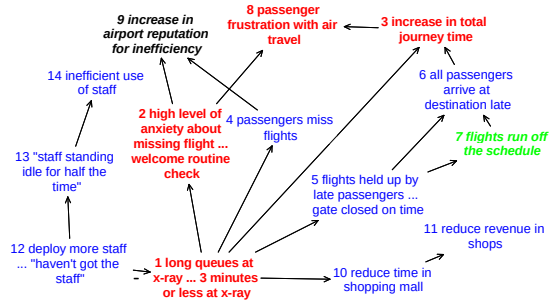
Mindmaps – TQM example



Mindmaps – MBS example



Cognitive Mapping



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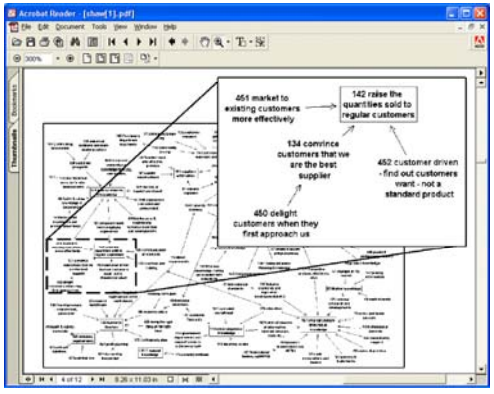
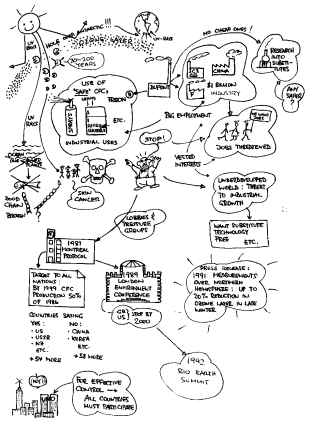


(Shaw, 2006)

A picture speaks a 1000 words ...

Rich picture diagram of "hole in the ozone layer" issues as perceived in 1988

Daellenbach (1994)



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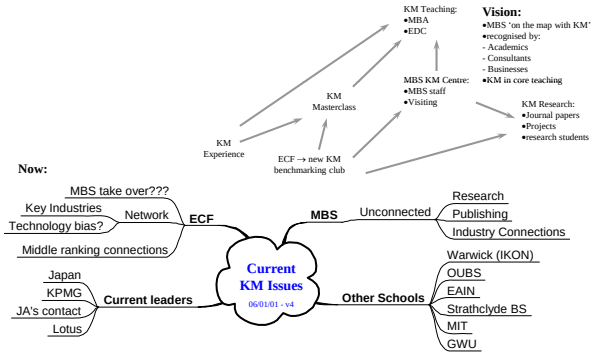
Combination of plots



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