

Decision Making in a Constrained Environment

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Introduction

- Decision making
- Capital investment challenges
- Prioritisation approaches
- Advancing decision making - What we have learned



Decision Making Context



Key Themes

- Strategy and Direction
- Culture
- Communication
- Structure
- External Influences



Capital Investment *Challenges*



Capital Investment: Challenges

- Requirements far greater than budget
- Decreasing overall budgets or need to find cost savings
- Multiple budget holders
 - each wanting the maximum from the overall budget
 - Some shouting louder than others
- Diverse, seemingly incomparable projects
- Quality of data/business cases
 - Uncertainty of outcomes (risk)
 - Understanding of costs/outcomes
- Greater scrutiny of investment decisions
- More pressure for 'must do'
- **Providing best value for money in a constrained environment**



Capital Investment: The Need

- **What?**

- Prioritise all capital projects – single order of priority across organisation
- Select portfolio of projects within budget constraint – delivering best value
- Accommodate 'must do' projects
- Respond to changes over year – revised budgets, overspend, urgent requests etc.
- Accommodate uncertainty

- **How?**

- Appropriate process using available data/information
- Robust process inspiring confidence
- Transparent and auditable
- Engaging to ensure committed outcome and ownership
- Taking into account all outcomes organisation needs



Prioritisation Approaches



Prioritisation Approaches

- **Monetary-based**

- Financial analysis
- Cost-Effectiveness Analysis (CEA)
- Cost-Benefit Analysis (CBA)

- **Multi-Criteria (MCA)**

- Analytic Hierarchy Process (AHP)
- Multi-Attribute Utility Theory (MAU)
- Multi-Criteria Decision Analysis (MCDA)

Ref: 'Multicriteria Analysis: A Manual', www.communities.gov.uk



Multi-Criteria Analysis

Table 4.1 Performance matrix

Options	Price	Reheat setting	Warming rack	Adjustable slot width	Evenness of toasting	Number of drawbacks
Boots 2-slice	£18				☆	3
Kenwood TT350	£27	✓	✓	✓	☆	3
Marks & Spencer 2235	£25	✓	✓		★	3
Morphy Richards Coolstyle	£22				☆	2
Philips HD4807	£22	✓			★	2
Kenwood TT825	£30				☆	2
Tefal Thick'n'Thin 8780	£20	✓		✓	★	5

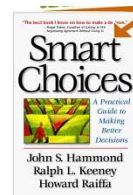


Decision Analysis References

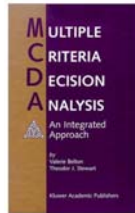
- *Decision Analysis for Management Judgement*
- Paul Goodwin and George Wright
- John Wiley and Sons (2003)
- ISBN 0470861088



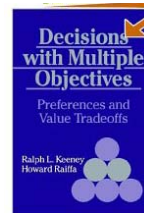
- *Smart Choices: Practical Guide to Making Better Decisions*
- John Hammond, Ralph Keeney, Howard Raiffa
- Harvard Business School Press, 1998
- ISBN 0875848575



- *Multiple Criteria Decision Analysis: An Integrated Approach*
- Valerie Belton and Theodore Stewart
- Kluwer Academic Publisher, 2001
- ISBN 079237505X



- *Decisions with Multiple Objectives: Preferences and Value Trade-Offs*
- Ralph Keeney and Howard Raiffa
- Cambridge University Press
- ISBN 0521438873



Capital Investment: MCDA

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Care with Prioritisation



Multi Criteria Decision Analysis



Multi-Criteria Decision Analysis Process

Vision and situation

What matters? – benefits

What can we do?

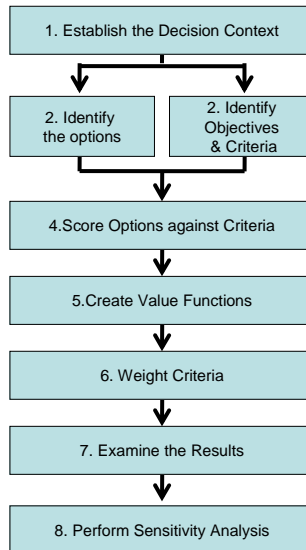
Judge relative benefits

Use data to guide preference

Balance criteria

Look at portfolio – trade-off?

Check confidence



GROUP INVOLVEMENT



MCDA Core Components

- **Criteria**
 - Strategic, non-redundant, differentiate decision, etc.
 - Agreed at the highest level
 - Benefits – financial and non-financial
- **Options/Project**
 - With appropriate supporting information
 - Grouped appropriately
- **Scoring options/projects against criteria**
 - Relative preference scoring
- **Weighting areas and criteria**
 - Swing weighting
- **Gut-feel test and sensitivity analysis**



Decision Science

● Tasks for models:

- Provide structure for group deliberation
- Separate facts from value judgements
- Combine the decision variables into an overall evaluation
- Allow experts to see the consequences of imprecision in judgements and differences of opinion

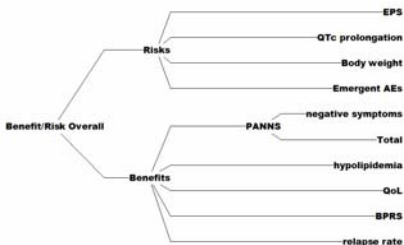
● Tasks for experts:

- Select the decision variables
- Judge the value contributed by those variables
- Assess the uncertainty of consequences
- Explore the evaluation model
- Make the final decision



Putting the *Ingredients* Together

Multi-criteria model



Group judgement

+



=

Smart decisions!



Decision Making

Decision making is a social process....

....the tools just support the evaluation



Scoring Criteria

Five different categories
(wastewater, stormwater, etc)

Assessment criteria group headings

Indicator

"Weightings" given to each
assessment criteria for each of
the five categories

Scores given to each scenario

	Wastewater							
	Social			Technical			Geo	Subtotal
	Landscape Aesthetics	Convenience/ Acceptability	Tangata Whenua	Technical	Legal Barriers	Ease of Construction	Land Stability	
	10	30	40	30	30	30	30	200
Scenario 1	3	5	3	5	4	4	3	156
Scenario 2	3	5	3	5	4	4	3	156
Scenario 3	3	4	4	5	3	3	4	152
Scenario 4	4	2	4	4	3	2	4	130

Total Score = sum of individual scores times their respective weightings



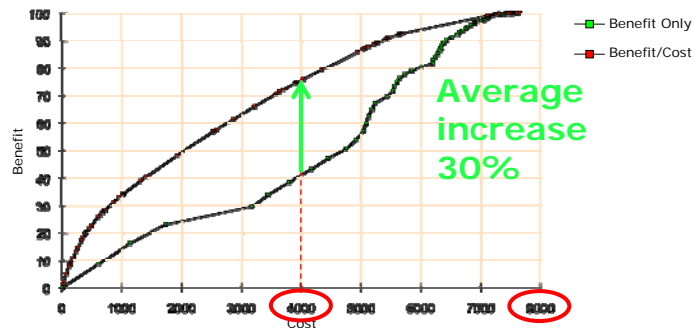
Criteria and scoring

- The things an organisation cares about
- The things that influence them
- Fixed Scales as per IIMM example
- Relative preference
- Weighting



Why Not Prioritise Just On *Benefit*?

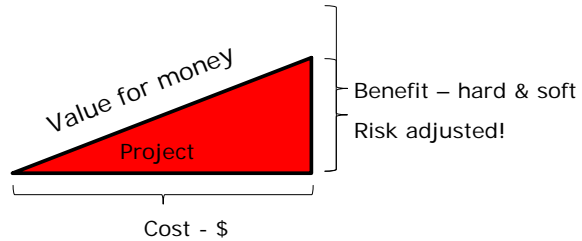
- If budget is 8,000, all options can be pursued
- If budget is 4,000, then 80% more benefit is realised by funding options on the basis of benefit/cost



Good Decisions About Projects

Ask three questions:

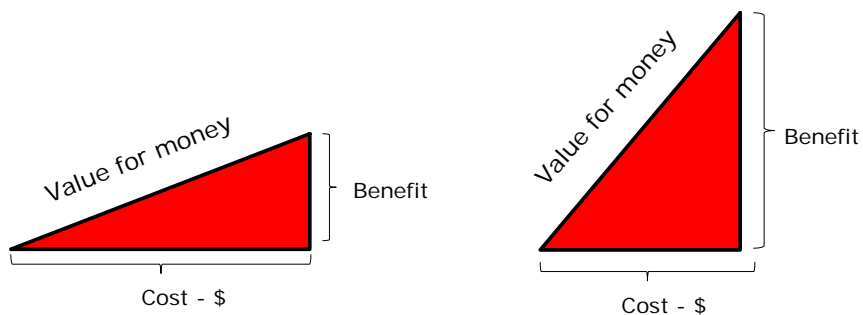
- What is the benefit, assuming success?
- What is the probability of success?
- What is the resource required to deliver the benefits?



Good decisions are based on: Risk-adjusted benefit ÷ Cost



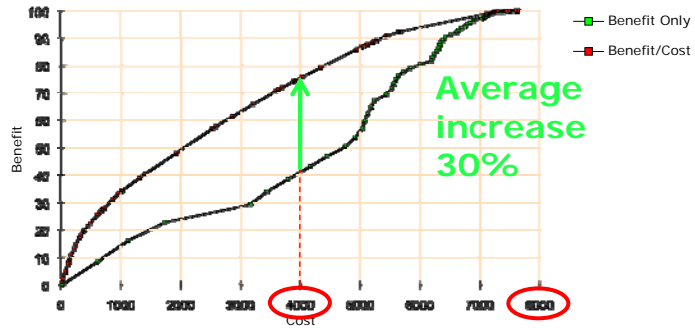
Cost: Benefit



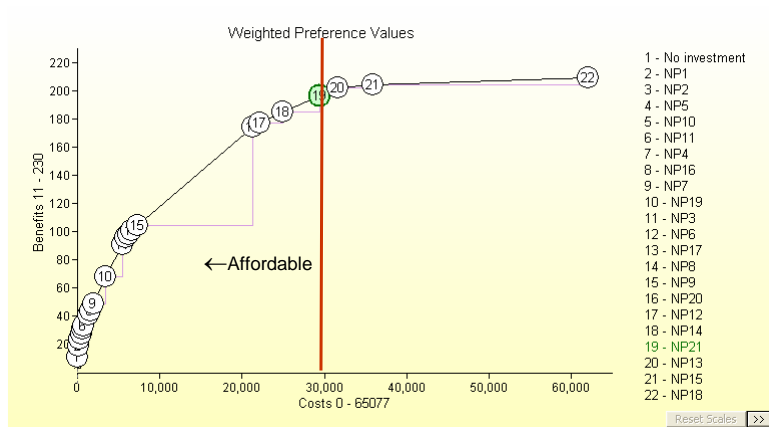
Which of these projects would you select?



Select Projects With The highest Cost:Benefit



Interpreting the Results



Making Costs *Transparent*

- \$11 million Capital Cost in 2013
- What does this mean?
- 1.3% increase in rates is more transparent and easier to comprehend
- Can compare opex versus capex



MCDA in summary?

- A theoretically sound approach and a set of techniques
- A way of looking at complex problems with mixed monetary and non-monetary objectives
- Breaks the problem into manageable pieces
- Enables apples and oranges to be compared using the common metric of value added
- Structures business judgement
- Serves as an aid to decision-making, but not to take a decision



Care with Prioritisation



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Key Messages

- Leadership and ownership
- Bring others into your decision-making process
- Support long-term plans with strong communications
- Use risk management to plan for scenarios
- Find clever ways to link strategic and operational planning in tighter times



Capital Investment: Monetary Analysis

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A Little Example

- How many bones are there in the adult human body?
 - Write down a range within which you are 100% confident the correct answer lies



Key messages

“If you are not clear on where you are going, decision-making is harder.”

“A group always comes out with a better decision than an individual.”



Where Can *Decision Conferencing* Help?

- Strategic planning
 - Identifying best strategic initiatives to deliver vision
- Budgeting/resource allocation
 - Where to invest limited budget/resource
- Rationalisation/cost reduction
 - What to stop doing
- Investment case development
 - Demonstration of value for money and best option
- Option development
 - Testing possibilities to find the best
 - Requirements identification
- Supplier selection
 - Transparently ensuring best value for money



An Approach: MCDA and Decision Conferencing

- A social (group) process to:
 - Establish a shared understanding of project issues
 - Develop a sense of common purpose
 - Understand different perspectives and objectives
 - Gain agreement & commitment to the way forward from those implementing the decisions
- A technical process (MCDA) to:
 - Support the social process
 - Provide real-time modeling
 - Conform to the axioms of decision theory
 - Perform sensitivity and robustness analysis
 - Act as knowledge repository or 'corporate memory'



Advantages of Decision Conferencing

- Creating a set of clear priorities
 - Achieves understanding and buy-in across the leadership team
 - Throughout the organisation and across multiple stakeholder groups
- Delivers benefit
 - Reduced time to reach aligned conclusion
- Creating Alignment and Commitment to the way forward
 - Compromise is not necessary as the impact of different perspectives is fully examined
- Auditable decisions
- Qualitative & Quantitative; Transparent; Inclusive
- Proven – in use worldwide

