Agenda

*Lessons from case-studies in the field of strategic planning*

- Barcelos town strategic plan (1994-95)
- Santa Catarina small textile firms’ survival problem (1997)
- Pernambuco Social Development and Human Rights (2007)

*(could also be lessons from case-studies of procurement decision support)*
Facilitating bid evaluation in public call for tenders: a socio-technical approach

Development of Reusable Bid Evaluation Models for the Portuguese Electric Transmission Company

Interested?
You are invited to attend...

DSS 2010
the 15th IFIP WG8.3 International Conference on Decision Support Systems

TC-45
Tuesday, 12:20-13:40
8.2.12

OR in Military I
Stream: OR in Military
Invited session
Chair: Ana Isabel Barros, Information & Operations, TNO - Defense, Security and Safety, POBox 96864, 2509 JG, The Hague, Netherlands, ana.barros@tno.nl

1 - Procurement Decision Support for Portuguese MoD: The MACBETH Approach and the Acquisition of 8x8 AWV
Carlos Bana e Costa, Engineering & Management, IST, Institute of Science and Technology, Technical University of Lisbon,
Some common critical mistakes that must be avoided

- Bad structuring
- Mix performance appraisal with value measurement
- Weighting criteria based on the intuitive notion of importance
- Making average sums of ordinal scores

Can the use of Multicriteria DSS, by itself – that is, without the intervention of a decision analyst – avoid all these mistakes?

Agenda

Lessons from case-studies in the field of strategic planning

- Barcelos town strategic plan (1994-95)
- Santa Catarina small textile firms’ survival problem (1997)
- Pernambuco Social Development and Human Rights (2007)

Aim: find elements of response to the question of “How to bridge the socio-technical gap?”
Santa Catarina textile case-study (1997)

What was the problem?

Managers of small textile companies in Santa Catarina, Brazil, asked for our assistance in creating competitive strategies to escape from failing in the global market.

How did we approach the problem?

We conducted the group learning process under a MCDA methodological framework, evolving throughout three main decision-aid phases in which several DSS were used.

The process has been much more a free-thinking oriented discussion forum for the creation of new intervention opportunities than a technical act of solving a decision-making problem.
Integrated use of several DSS

**Graphics COPE**
- Supported idea generation and organization complexity to making key concerns emerge.

**MACBETH**
- Supported partial and inter-criteria preference modeling.

**V.I.S.A**
- Supported evaluation of firms' weaknesses and strengths and sensitivity analysis.

**EQUITY**
- Supported the generation and prioritization of strategies for action in each company.

---

**Cognitive mapping**

Graphics COPE's "cluster analysis" found groups of closely linked aspects. The intention is to attempt the formation of clusters where the nodes in each cluster are tightly linked to one another (similar) and the number of links (or bridges) with other clusters is minimized.

Several elementary concerns as means to achieve a common end (fundamental concern)
From the Conclusions of the 1999 *DSS in action* paper:

“Under a constructive attitude in decision aid, the DSS can be, at least they were in our case, effective tools for helping the facilitators to help the decision-actors, instead of magic ‘‘black-boxes’’ which give the dangerous illusion that they are ready for direct use by managers without the intervention of a decision-aid expert.”

**Bridging the socio-technical gap in…**

Decision Support Systems (DSS)

or, with…

Decision Support Support Systems (DSSS)

---

**In the 1999 *DSS in action* paper:**

Explicit reference to

- Facilitator
- Provide the group with a common language for debate
- Constructive attitude in decision aid
- Helping the decision-actors

Yet, no reference to

- Decision Conference
- Requisite model
- Socio-technical process
- Process consultation

⇒ Lack of comprehensive theoretical framework
In 1999:

- Invited to join the Operational Research Department of LSE as Centennial Professor of Decision Sciences

- Lecturing Decision Analysis together with Lawrence Phillips

- Discussing key concepts and merge views with Larry: MCDA, Decision Conferencing (join IDCF), Requisite Model, Socio-technical Process, Process Consultation, …

- Discussing key concepts and exchange viewpoints with Jonathan Rosenhead: Learning paradigm, Problem Structuring Methods, Metamethodologies, …

Barcelos case (1994-1995)

What was the problem? Help the local politicians and planners to develop a strategic plan

Several DSS (Decision Explorer, STRAD, M-MACBETH, EQUITY) supported structuring, multicriteria evaluation and prioritization of intervention actions

In the 2002 paper … … Explicit reference to

- Decision Conference
- Requisite model
- Socio-technical process
- Process consultation
- Methodology enhancement

Yet, a few process mistakes, namely

- To much protagonist of the Mayor
- No easy eye-to-eye contact between participants …
the layout of the meeting room. (Note that the arrangement of the environment can have a profound influence on the effectiveness of group working – cf. Hickling, 1990, Phillips and Phillips, 1993).

Note also the Mayor’s armchair!!!

So...
... what kind of approach?

Normative?  Prescriptive?  Constructive!

Participation

→ a sociotechnical approach

Soft? Hard? Both: Smart

Strategic planning with multi-criteria decision analysis and decision conferencing
Social component: Methodological guidelines

Decision Conferencing

- “Decision conference is a gathering of key players who wish to resolve important issues facing their organisation, assisted by an impartial facilitator who is a specialist in decision analysis and works as a process consultant (Schein 1999), using a model of relevant data and judgements created on-the-spot to assist the group in thinking more clearly about the issues.”

Requisite Models

- Definition: Model is requisite when its form and content are sufficient to resolve the issues at hand. Model generation: Through iterative and consultative interaction amongst specialists and key players, facilitated by an impartial decision analyst.

Process Consultation

- The problem and the solution belong to the client not to the consultant.

Decision Conferencing Process
Two other case-studies of Public Strategic Planning in Puerto Rico (2003-2004) and in Pernambuco (2007)

- Development of a Long Term Vision for Puerto Rico 2025
- Development of the Social Development and Human Rights Medium Term Strategic Plan for Pernambuco 2008-11
- A comprehensive intervention context
- A focused intervention context
- More than 100 stakeholders involved
- About 30 actors involved

Pernambuco 2008-11: An government initiative to create convergence on a strategy for Pernambuco’s medium term social development…

… engage and align technical and political leaders of the new Secretary of State for Social Development and Human Rights (SEDSDH) and provide for the participation of local experts
Client:
Secretary of State of Social Development and Human Rights (SEDSDH) of the Government of the Brazilian State of Pernambuco

Objective of the intervention:
To help SEDSDH develop its medium term strategic plan (PPA 2008-2001)

Methodology:
Socio-technical approach for public strategic planning

Duration of the decision conferencing process:
Five consecutive days (from 11 to 15 June 2007)

Participants:
About thirty technical and political actors

Process consultation team:
1 facilitator + 2 decision analysts + 2 experts

Output of the process

- Oysters
- Pearls
- White elephants
- Bread and butter
Two working-groups: Technical Panel and Evaluation Panel with different tasks in the process

<table>
<thead>
<tr>
<th>Participants</th>
<th>Technical Panel</th>
<th>Evaluation Panel</th>
<th>Tasks</th>
<th>3 days</th>
<th>2 days</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Technical experts of SEDSDH</td>
<td>• Structures the objectives from SEDSDH mission</td>
<td>• Validates and weights the fundamental objectives</td>
<td>• Structures the objectives from SEDSDH mission</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Representatives of the seven entities that integrate SEDSDH (departments and institutes)</td>
<td>• Conceives intervention actions (projects) and structures coherent programs (packages of projects) to achieve the objectives</td>
<td>• Evaluates the extent to which each program (package of projects) contributes to achieve the objectives</td>
<td>• Organizes factual information about the programs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Political decision-makers of SEDSDH</td>
<td>• Organizes factual information about the programs</td>
<td>• Evaluates the doability of each program</td>
<td>• The secretary of state and the sub-secretaries (leaders of the 7 units merged in SEDSDH)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• The secretary of state and the sub-secretaries (leaders of the 7 units merged in SEDSDH)</td>
<td>• Presents factual information about the programs</td>
<td></td>
<td>• The secretary of state and the sub-secretaries (leaders of the 7 units merged in SEDSDH)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3-days Structuring Decision Conference with Technical panel only

2-days Evaluation Decision Conference with the Evaluation Panel

Members of the Technical panel participated as observers in the Evaluation Decision Conference
Layout of the decision conferencing room

Post-Its ideation session

Cognitive mapping using Decision Explorer
Identifying means and ends

Achieving a coherent set of shared strategic objectives

Copyright 2010 Carlos A. Bana e Costa

Qualitative evaluation of 25 programs by the politicians

Copyright 2010 Carlos A. Bana e Costa
Deriving benefit scores for the programs on each objective using the M-MACBETH decision support system

Weighting the objectives

Pernambuco caring for the population living on the street

Current situation (Status Quo)

Promote the inclusion and social protection of people and families
Guarantee and promote human rights and make them universal
Socialise the adolescent in conflict with the law and re-socialise the prison population
Calculating the overall benefit score of each program

Assessing the doability of each project
Benefit vs. Doability analysis

PR 2025:
An government initiative to create convergence on a strategy for Puerto Rico’s long-term future …

… engage community and private sector leaders and provide for the participation of local experts
The Puerto Rico 2025 project was structured around four phases

**Project Phases**

- **August – November 2003**
  - **EVALUATION/ASSESSMENT**
    - Where is Puerto Rico today?
    - “The need for action”

- **October 2003 – January 2004**
  - **VISION**
    - Where does Puerto Rico want to be in 2025?
    - “The fundamental objectives”

- **January – March 2004**
  - **STRATEGIC PRIORITIES**
    - What are the strategies that will mostly contribute to reach the vision?
    - “The strategies”

- **April – May 2004**
  - **IMPLEMENTATION LAUNCH**
    - Transfer responsibilities to the independent entity
    - “The Launch”

**Design of the social process**

Transparent prioritisation, budgeting and resource allocation with multi-criteria decision analysis and decision conferencing

Lawrence D. Phillips - Carlos A. Bana e Costa
Strategies were evaluated and prioritized in 10 Decision Conferences

**Economic Development**
- Innovation and Enterprise
- Competitiveness and Connectivity
- Income and Opportunity

**Social Development**
- Health
- Education
- Public Safety

**Culture**
- Culture

**Infrastructure/Environment**
- Utilities
- Land Use and Environment
- Transport

The process of developing and prioritizing the strategies for Puerto Rico mobilized more than 100 stakeholders.

**Timeline:**
- **Aug – Nov 2003**: Assessment
- **Oct – Dec 2003**: Visioning
- **Jan – Mar 2004**: Strategies: development & prioritization
- **Apr – May 2004**: Transition and implementation launch
All strategies scored in terms of their direct contribution to the achievement of each of the fundamental objectives.

The doability of each strategy was evaluated in a similar process through a consolidated qualitative judgment that considered technical, political, institutional, financial and other issues.

Strategies were evaluated according to their direct contribution to achieve fundamental objectives in each area and according to their perceived doability.

Example of the Output Obtained in each of the 10 Decision Conferences.
Layout of the decision conference room

**ROOM LAYOUT**
- 2 SCREENS
- 2 COMPUTERS AND NOTE TAKER
- 2 PROJECTORS
- FLIP-CHART
- GROUP SITS IN ROUND SHAPE

**PROCESS CONSULTING TEAM**
- 1 facilitator
- 1 analyst (computer operator for M-MACBETH)
- Optional (depending on the context):
  - 1 analyst/consultant (computer operator for background/support information)
  - 1 note taker

**GROUP OF PARTICIPANTS**
- 5 to 15 people with a balanced perspective on the meeting's subject (experts, stakeholders, decision makers,...)
MACBETH was used to evaluate the strategies in terms of their contribution to achieve each fundamental objective.
## Areas: Productivity, Competitiveness & Connectivity

<table>
<thead>
<tr>
<th>Strategies</th>
<th>Ranking</th>
<th>V. Strong</th>
<th>Strong</th>
<th>Very Strong</th>
<th>Weak</th>
<th>Very Weak</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1.1 Overhaul system for export promotion</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1.2 Improve infrastructure for information</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1.3 Increase human productivity through tech.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.5.1 Reposition/Rebrand</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1.4 Increase human productivity through education</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.2.1 Improve infrastructure for goods</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1.5 Deepen people linkages</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.5.2 Overhaul system for national strategy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1.6 Attract global talent</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1.7 Provide multilingual abilities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.3.2 Decrease regulatory burden</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.4.2 Decrease subsidies</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.2.3 Improve infrastructure for people</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.4.3 Increase efficiency of local utilities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1.8 Decrease cost of labor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.4.1 Decrease protection</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.3.1 Decrease financial cost of government</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Doability**

- **Oysters**: Pearls
- **White Elephants**: Bread and Butter

Contribution to the vision

Doability considering political, institutional, financial and technical dimensions.
Puerto Rico 2025
Strategic Decision Conference

The primary objective was to consolidate
the results of the 10 area decision conferences
into a coherent and integrated strategic plan
Puerto Rico 2025
Strategic Decision Conference

Benefit/effort ratios for each strategy in each area of concern

<table>
<thead>
<tr>
<th>Area of Concern</th>
<th>Benefit</th>
<th>Effort</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Culture</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Income and Opportunity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Competitiveness and Connectivity</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Integrated Strategic Packages (implementation plan)

Strategic Decision Conferences (April 22 and 24)

Group analysis across the ten areas of concern

PACKAGES:
- PACKAGE 1: Immediate Term
- PACKAGE 2: Short Term
- PACKAGE 3: Medium Term
- PACKAGE 4: Long Term
Equity model that supported the discussion on the packages of strategies for implementation

**Equity Model : First Output**

- Four prioritization packages were created:
  - immediate (included those strategies to be pursued if only 10% of the total effort is to be put forth),
  - short-term (included those strategies to be pursued if only 30% of the total effort is to be put forth),
  - medium-term (included those strategies to be pursued if only 70% of the total effort is to be put forth)
  - and long-term (included those strategies to be pursued if 100% of the total effort is to be put forth).

**Fine-tuning prioritization packages (continued)**

- Rearranged short-term package
- Rearranged medium-term package
Strategic Decision Conference

2nd day agenda: Identify from the short-term package the immediate strategies

Saturday, April 24th
### TRANSPORT – Distribution of strategies in terms of implementation packages

#### Strategies

1.1.1 Improve the productivity and attractiveness of existing ports and airports
1.1.2 Expand the capacity of sea ports for cargo services
1.1.3 Transform small and military airports into new ports for shipping services
1.2.1 Improve the productivity of passenger port terminals
1.2.2 Expand capacity of passenger sea terminals
1.2.3 Increase the number and frequency of maritime connections for passengers
2.1.1 Improve the productivity of air cargo services
2.1.2 Expand capacity of existing air cargo facilities
2.1.3 Transform small and military airports into new airports for cargo services
2.2.1 Improve the productivity of passenger air terminals
2.2.2 Expand capacity of passenger air terminals
2.2.3 Increase the number and frequency of air connections for passengers
3.1.1 Improve the productivity of land freight services
3.1.2 Invest in new land freight systems
3.2.1 Complete the highway and road network
3.2.2 Increase the efficiency/capacity of existing roads
3.2.3 Create and promote efficient and reliable collective transportation
3.2.4 Ensure that the land use plan reduces the need for transportation
3.3.1 Encourage reduction in car use
3.3.2 Promote clean fuels and advanced technology for transportation
3.4.2 Create new mechanisms to incorporate the community in transportation planning and communication process

#### Implementation packages

(as defined at the Strategic Decision Conference)

<table>
<thead>
<tr>
<th>Package</th>
<th>Immediate</th>
<th>Short-term</th>
<th>Medium-term</th>
<th>Long-term</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1.1</td>
<td>1.1.1</td>
<td>1.1.2</td>
<td>2.1.1</td>
<td>2.2.1</td>
</tr>
<tr>
<td>3.2.2</td>
<td>1.1.1</td>
<td>1.1.2</td>
<td>2.1.1</td>
<td>2.2.1</td>
</tr>
<tr>
<td>3.2.3</td>
<td>3.2.4</td>
<td>1.2.1</td>
<td>3.2.2</td>
<td>2.2.2</td>
</tr>
<tr>
<td>3.2.4</td>
<td>3.2.4</td>
<td>1.2.1</td>
<td>3.2.2</td>
<td>2.2.2</td>
</tr>
</tbody>
</table>

#### Transition and implementation

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Assessment</td>
<td>Visioning</td>
<td>Strategic alternative development &amp; prioritization</td>
</tr>
<tr>
<td>Transition and implementation launch</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Economic development

- Competitiveness, Productivity and Connectivity
- Opportunities and Income
- Innovation and Enterprise

#### Social development

- Culture
- Education
- Health
- Public Safety

#### Infrastructure / environment

- Utilities
- Transport
- Land Use and Environment

#### Culture

- Culture

#### Copyright

Copyright 2010 Carlos A. Bana e Costa
At the end of the day...

Alice and the Cheshire Cat

"Cheshire Puss," she began... Would you tell me, please, which way I ought to go from here?"

That depends a good deal on where you want to get to," said the Cat.

"I don't much care where—" said Alice.

"Then it doesn't matter which way you walk," said the Cat.

"—so long as I get somewhere," Alice added as an explanation. "Oh, you're sure to do that," said the Cat, "if you only walk long enough."

Lewis Carroll, Alice's Adventures in Wonderland