

# On the concept of Decision Aiding Process

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# Outline

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- 3 Deciding and Aiding to Decide
- 4 The Decision Aiding Process
- 5 Rationality in Decision Aiding
- 6 Conclusions

## Motivations

Are we psychotherapists?  
Deciding and Aiding to Decide  
The Decision Aiding Process  
Rationality in Decision Aiding  
Conclusions

# Who is she?



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# Why we are not psychotherapists

language: formal (reducing ambiguity)  
abstract (domain independent)

Models of rationality

## Should we become?

- Can we control our profession?
- Do we have manuals for novices?
- Do we have protocols for assessment?
- Do we have specific training?

## What are we looking for?

### A Science?

- Decision Science?
- Decision Aiding Science?
- What is a Science?

We need a Decision Aiding Methodology

A coherent structure of reasoning about theories and practices concerning deciding and aiding to decide.

## What are we looking for?

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## Deciding ...

- Decision Maker
- Decision Process
- Cognitive Effort
- Responsibility
- Decision Theory

## ... and Aiding to Decide

- A client and an analyst
- Decision Aiding Process
- Cognitive Artifacts
- Consensus
- Decision Aiding Methodology

## What is a Decision Aiding Process?

*The interactions between somebody involved in a decision process (the client) and somebody able to support him/her within the decision process.*

Consensual construction of shared cognitive artifacts

A Decision Aiding Process makes sense only with respect to a Decision Process in which the client is involved and with respect to which demands advice.

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## What is a Decision Aiding Process?

A Decision Aiding Process is a Decision Process where at least two actors are involved: the client and the analyst, with at least two concerns: the client's "problem" and the analyst's job, mobilising at least the following resources: the client's domain knowledge and the analyst's methodological knowledge.

A Decision Aiding Process becomes part of the Decision Process for which it has been established. The analyst enters as an actor such a Decision Process.

## Its Cognitive Artifacts

- Representation of the problem situation
- Problem Formulation
- Evaluation Model
- Final Recommendation

## Representing a Problem Situation

- Who has a problem?
- Why this is a problem?
- Who other is affected by the decision process?
- Who decides?
- Who pays for the consequences and the bill?
- What I am doing here?

## A Problem Situation

$$PS = \langle \mathcal{A}, \mathcal{O}, RS \rangle$$

$\mathcal{A}$  actors, participants, stakeholders

$\mathcal{O}$  objects, concerns, stakes

$RS$  resources, commitment

## Formulating a Problem

*Constructing a first formal representation of the client's concerns, applying an abstract and formal language, using a model of rationality.*

- What objects do we consider in formulating “the problem”?
- What do we know or are we looking for such objects?
- What do we want to do with such objects?

# A Problem Formulation

$$\Gamma = \langle \mathbb{A}, \mathbb{V}, \Pi \rangle$$

- $\mathbb{A}$  Actions
- $\mathbb{V}$  Points of view
- $\Pi$  Problem statement

## Constructing an Evaluation Model

- Fixing alternatives.
- How to describe them?
- Are there any preferences?
- Are we sure about the information?
- How to put all this information together?

## Evaluation Model

$$\mathcal{M} = \langle A, D, E, H, U, \mathcal{R} \rangle$$

*A* alternatives, decision variables, ...

*D* dimensions, attributes, ...

*E* scales associated to attributes,

*H* criteria, preference models, ...

*U* uncertainty, epistemic states, ...

*R* procedures, algorithms, protocols ...

## Establishing a final Recommendation

- Going back to reality.
- What do we put in the final report?
- Is it valid?
- Is it legitimated?
- It works?
- Are we satisfied?

## Meaningfulness ...

- Do we use the information correctly?
- Is it meaningful for the analyst?  
(*Measurement Theory*)
- Does it make sense for the decision process?
- Is it meaningful for the client?  
(*Client Satisfaction*)

## ... and Legitimation

- Ownership
- Organisational Dimension
- Culture
- Decision Process

## Which Rationality Principles?

Being rational while deciding, or being rational while aiding to decide?

Economic Rationality

To respect a number of axioms.

Bounded Rationality

To achieve a satisfying result.

Communicative Rationality

To create a sense possibly shared and consensual.

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# How Rationality is legitimated?

- Normatively
- Descriptively
- Prescriptively
- Constructively

## Decision Aiding Approaches

*A decision aiding approach is not a collection of methods. It can limit the analyst in using some methods, but is not limited to these. It is possible to be constructive, while using combinatorial optimisation methods and being normative, while using outranking based methods.*

**A decision aiding approach characterises how the decision aiding process is conducted.**

## So what?

- Constructing rationality is a distributed cognitive process which can be analysed, structured and conducted.
- Decision theory is in a quite good shape, but a decision aiding methodology yet has to make up its way.
- We do not have to become psychotherapists or lawyers, but we still have to learn and understand our profession.