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Scholten, Lisa

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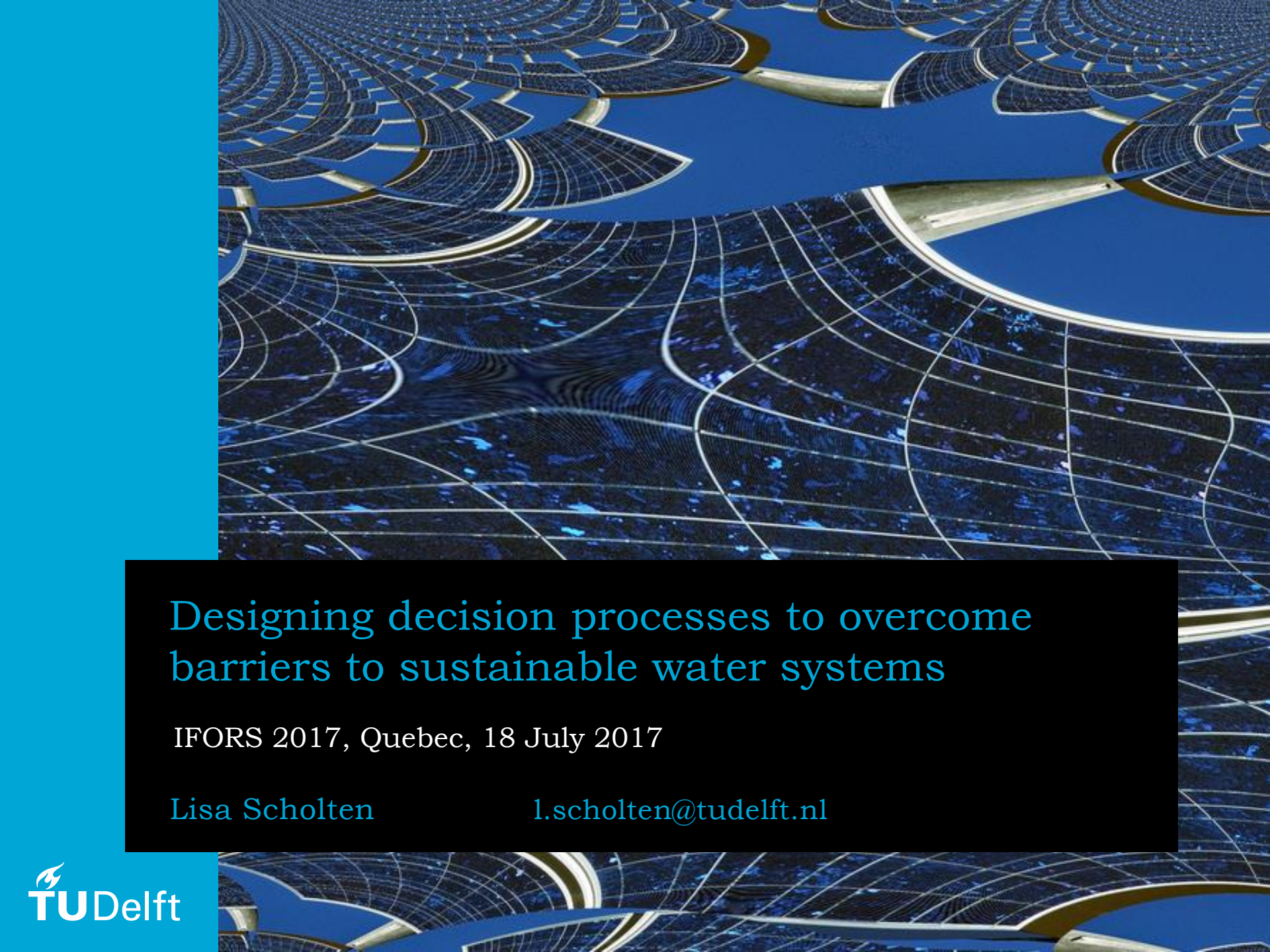
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Designing decision processes to overcome barriers to sustainable water systems

IFORS 2017, Quebec, 18 July 2017

Lisa Scholten

l.scholten@tudelft.nl

Water management needs better decisions.



Designing decision support interventions

- + Mixed multi-methodology designs (MMD) promising for complex problems
- + Increasing number & better reporting
- + Experiential results indicate good/better outcomes
(Munro & Mingers 2002, Pollack 2009, Howick & Ackermann 2011)



But:

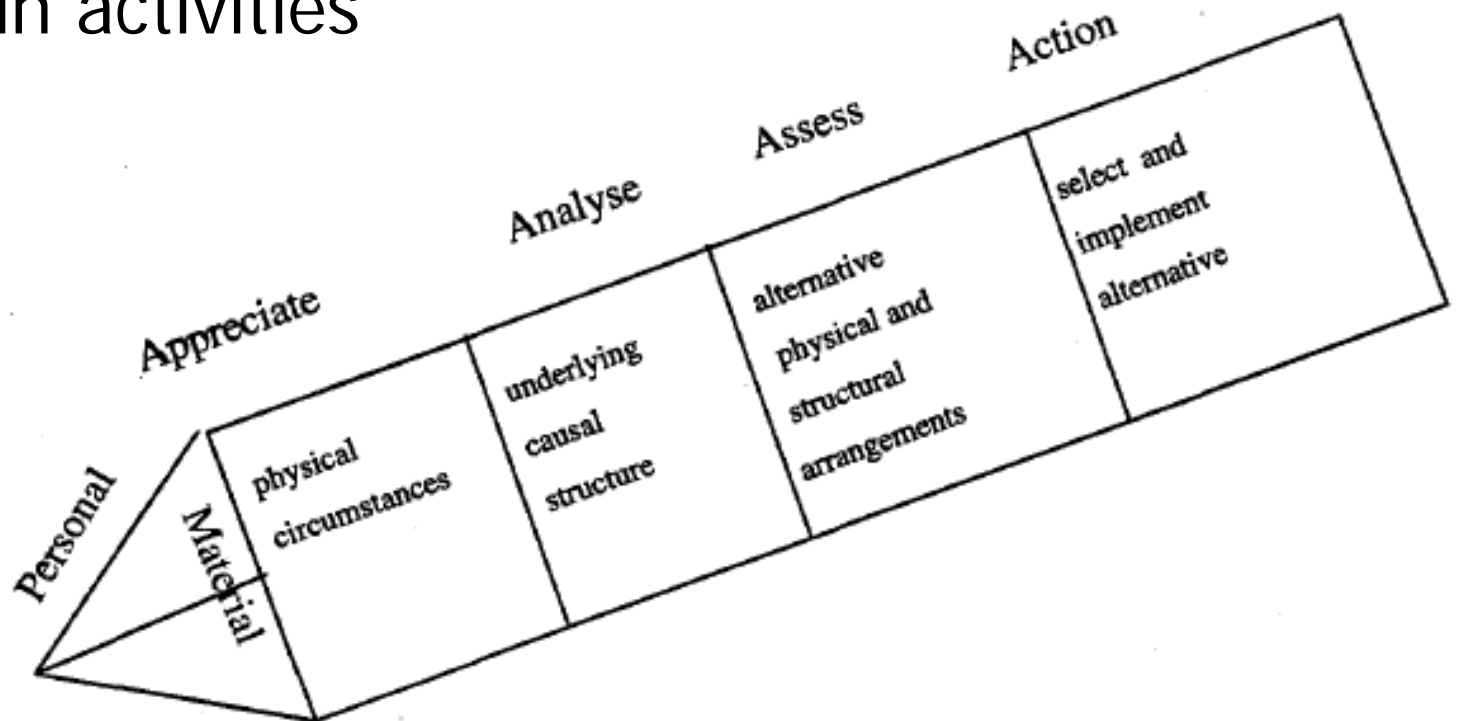
- Absence of cross-case validation and evaluation
- Limited understanding of what works, when, why
- Design reflects consultant's command of methods
- No agreed guidelines for classification & selection

 → **Hinders targeted MMD design & uptake**

Mingers & Brocklesby framework

Motivation: Classify PSM as basis for MMD to focus on those aspects that need particular attention.

- Three impact dimensions «worlds»
- Four main activities



Ex.: Soft Systems Methodology mapped

	Appreciation of	Analysis of	Assessment of	Action to
Social	social practices, power relations	distortions, conflicts, interests	ways of altering existing structures	generate empowerment and enlightenment
Personal	individual beliefs, meanings, emotions	differing perceptions and personal rationality	alternative conceptualizations and constructions	generate accommodation and consensus
Material	physical circumstances	underlying causal structure	alternative physical and structural arrangements	select and implement best alternatives

Mingers and Brocklesby (1997)

What conceptual model?

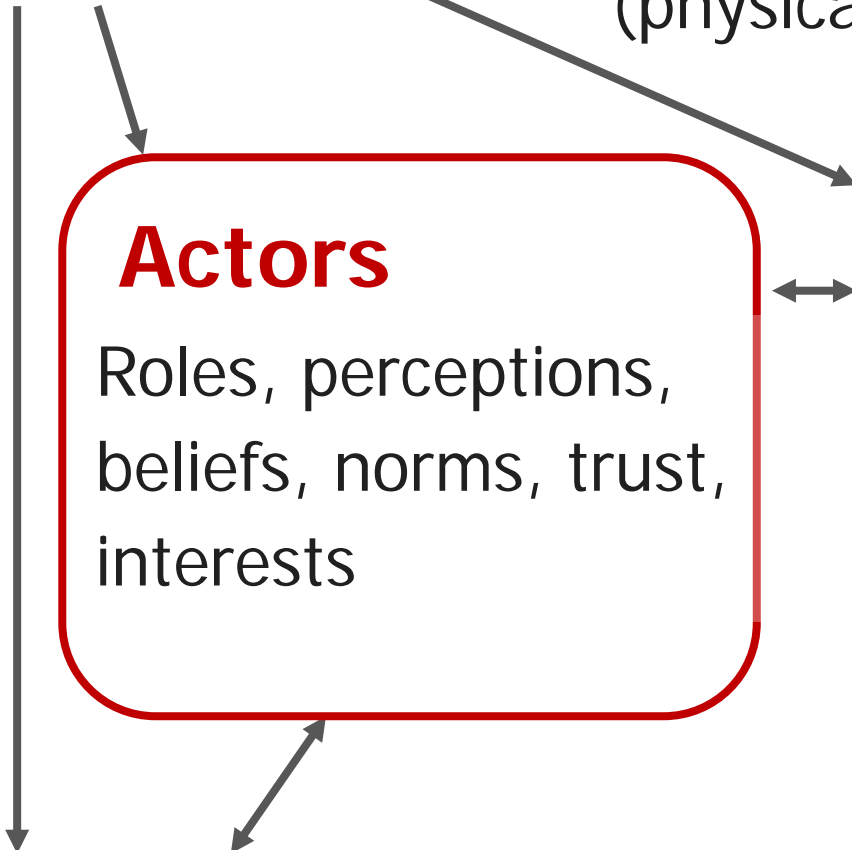
$$P(DM \text{ success}) = f(S, P, M, a_i, MMD).$$

$, a_i = 1 \dots 4$

1. How to operationalize social, personal, material, process, and success dimension?
2. In which way does MMD affect variables and hence, decision-making success?
3. Can adverse factor configurations be identified to inform targeted MMD design?

Understanding barriers and enablers

Context Initial conditions and issues, environment
(physical, organizational, regulatory)



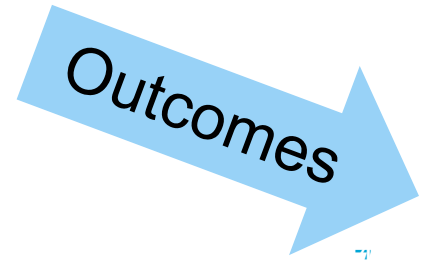
Actors

Roles, perceptions, beliefs, norms, trust, interests

Process, tactics, structures of collaboration

Directive or facilitative, hierarchies, committees, decision-making tactics

Alternatives Anticipated performance (risk, ambiguity, benefits, liabilities)



A practicable diagnostic framework

- Process dynamics and tactics
 - Nutt 2002, 2007, 2008; De Bruijn et al. 2010
- Participation, power & roles, organizational embedding, social network topography
 - Bryson et al. 2004, 2013, 2015; Smith 2005, Ingold & Leifeld 2014
- Goal alignment and sharedness
 - Kerr & Tindale 2004, Provan & Kenis 2008
- Information access and cognitive centrality
 - Davis 1996, Kameda et al. 1997, Tindale & Kameda 2000

Practical testing



- 3 major water-energy projects
- 17 explanatory & 4 success variables, 9 hypotheses
- 12 interviews, questionnaire survey
- Qualitative analysis of decision-making process
- Social network analysis, collaboration in 3 phases

Default planning process

Results removed in web version.
Please contact l.scholten@tudelft.nl for
more information.

Process dynamics and tactics

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Actor collaboration & roles

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Goal alignment, cognitive centrality & Information access

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Recommendations mapped to M&B's framework

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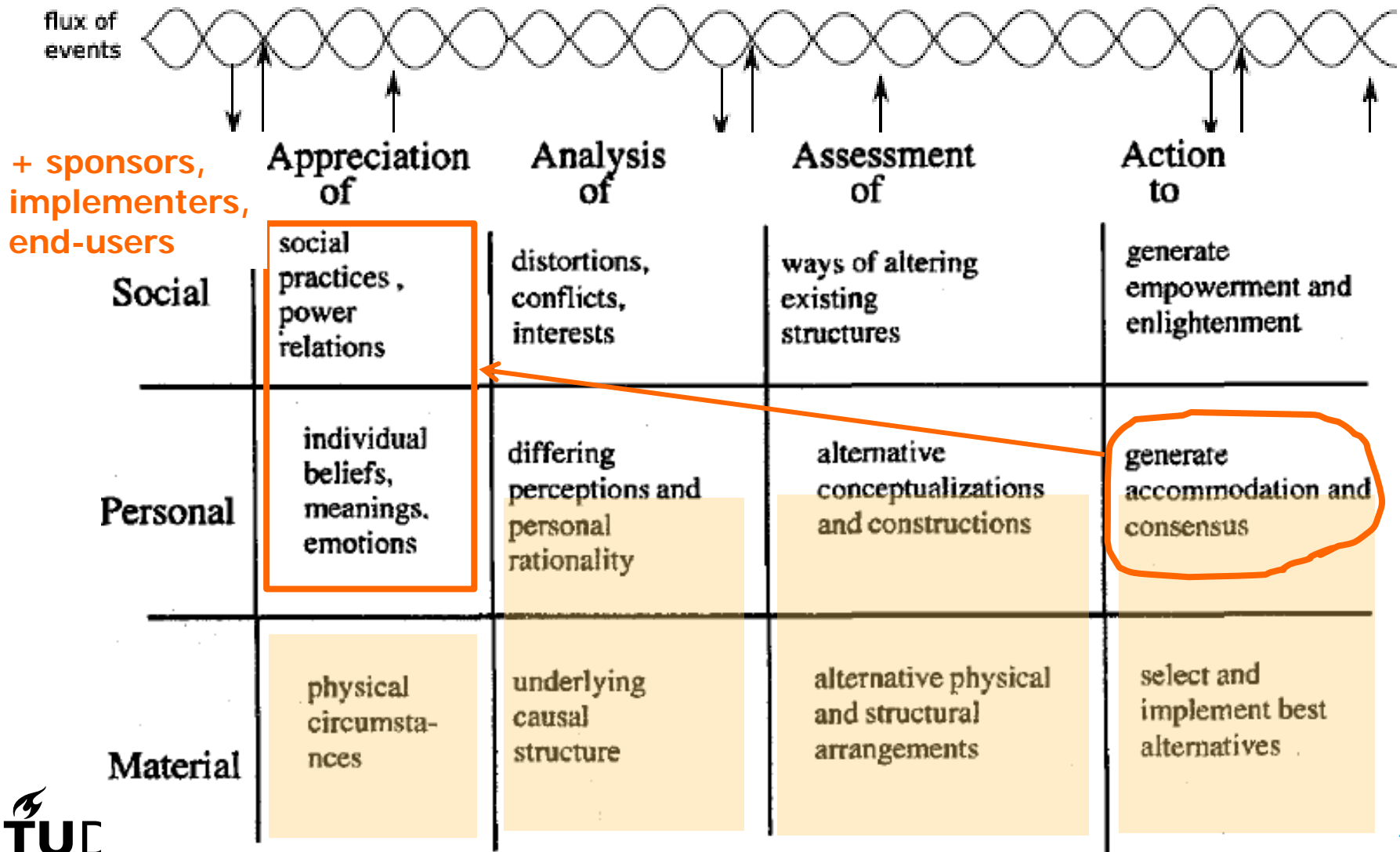
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Recommendations mapped to M&B's framework

+ sponsors,
implementers,
end-users

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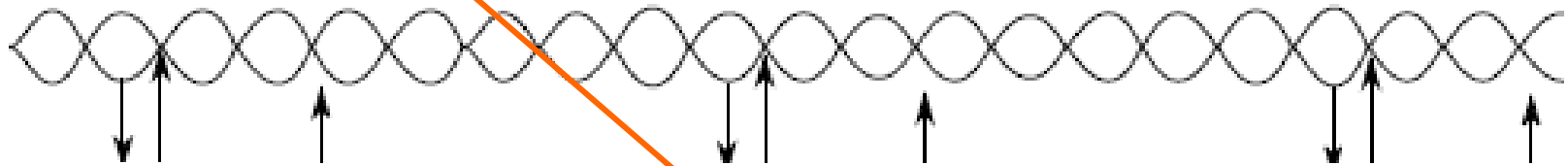
Recommendations mapped to M&B's framework



Recommendations mapped to M&B's framework

+ empower facilitators

flux of events



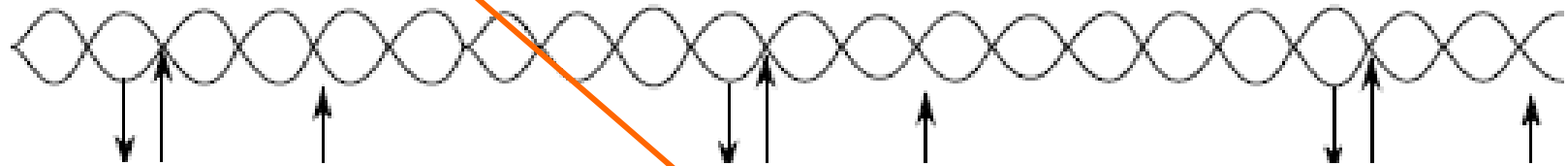
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+ integrate analytic tactics

+ ensure sharing, discussion of unique information

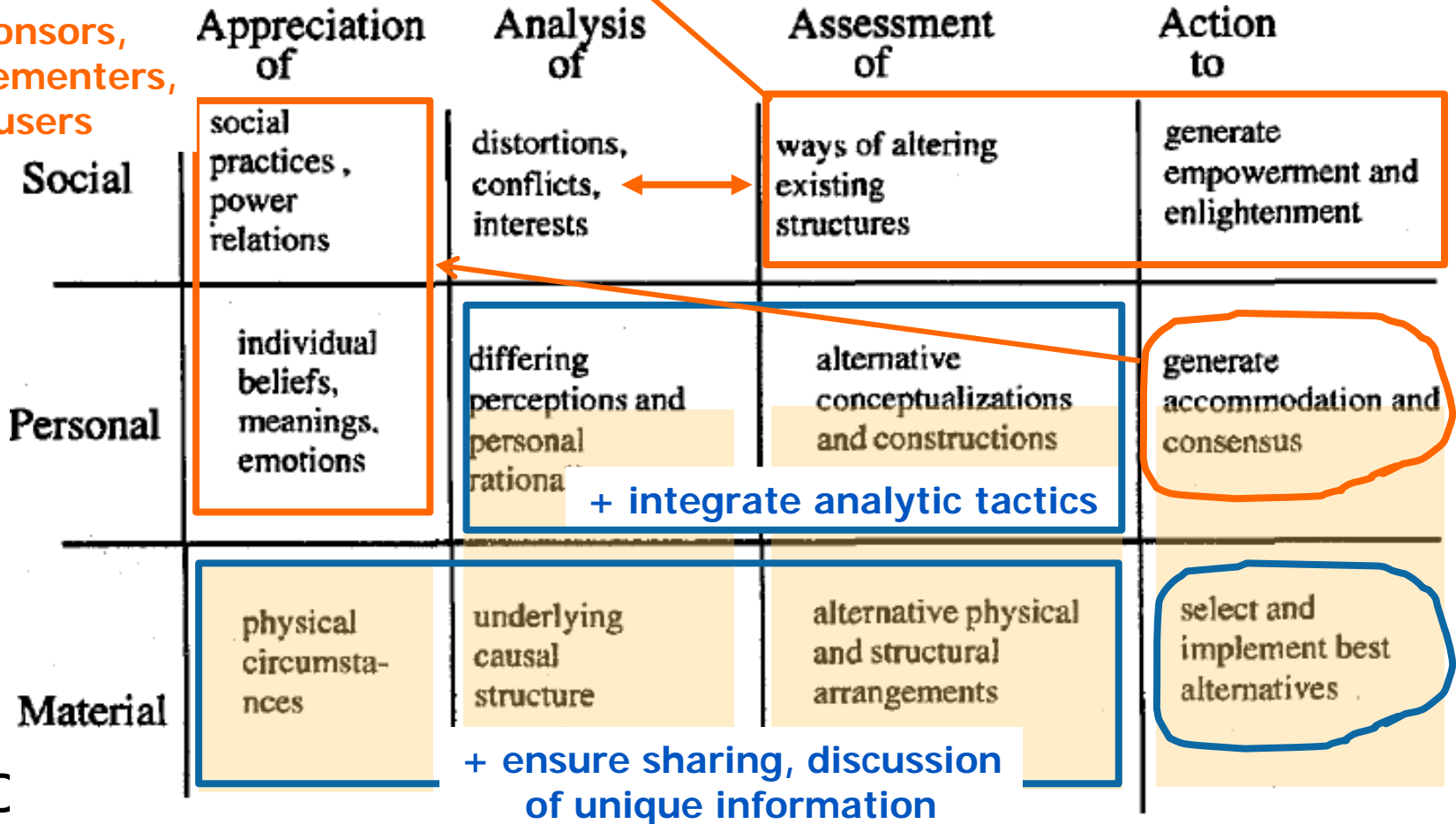
Recommendations mapped to M&B's framework

+ empower facilitators

Which tactics precisely?
 What process dynamics?
 Participation design throughout?

flux of events

+ sponsors,
 implementers,
 end-users



Reflections on way forward

- We miss agreed conceptual models that link causes, symptoms & treatment to outcomes
- Diagnostic approaches & testing across cases needed to understand relationships
- Once established, decision support approaches can be compared and classified based on causes & symptoms they focus on to inform design
- For water: one-off project or training to develop 'learning organizations' ?
 - Study of past cases to inform 'entry level'?

Conclusions

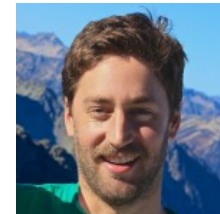
Analysis of past projects can provide relevant insights for tailoring interventions to a specific case.

Longitudinal analyses of the decision process and social networks are just one example.

Let's better use insights from neighbouring disciplines to enrich theoretical basis and generate insights for testing what works, when, and why.

This will support better classification, comparison, selection, and development of best practices.

Thank you.



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