

Designing decision processes to overcome barriers to sustainable water systems (PPT)

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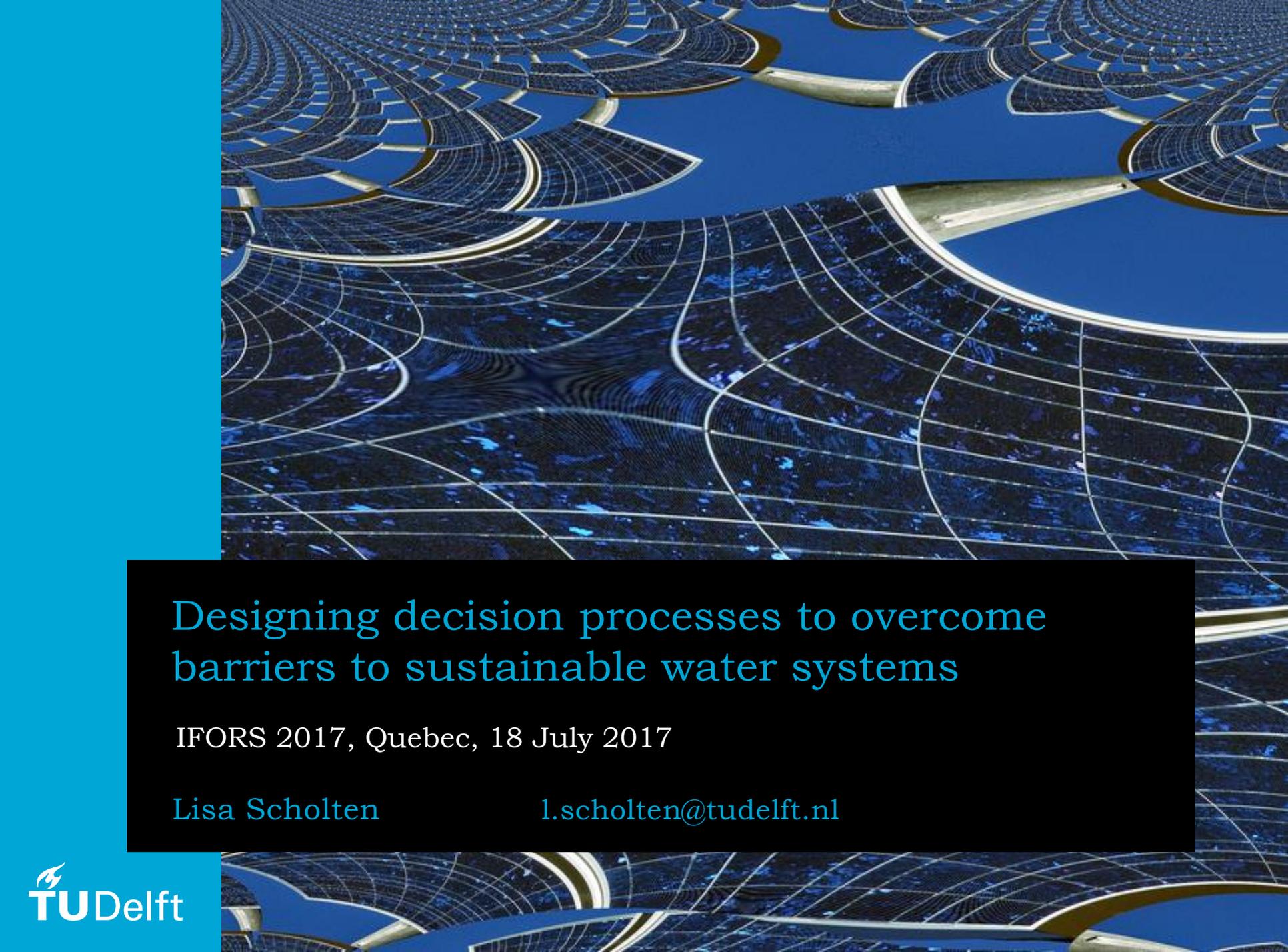
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Designing decision processes to overcome barriers to sustainable water systems

IFORS 2017, Quebec, 18 July 2017

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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:

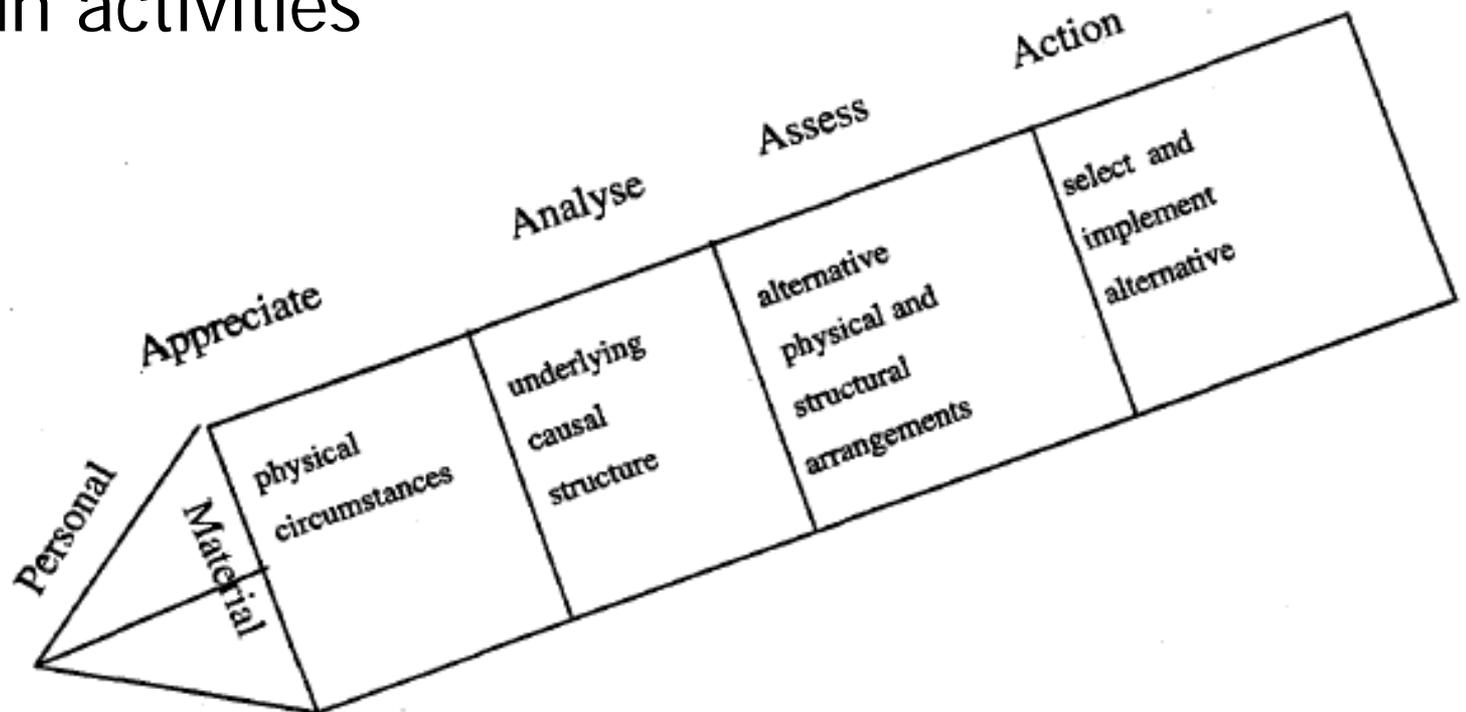
- Absence of cross-case validation and evaluation
- Limited understanding of what works, when, why
- Design reflects consultant's command of methods
- No agreed guidelines for classification & selection

 → **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?

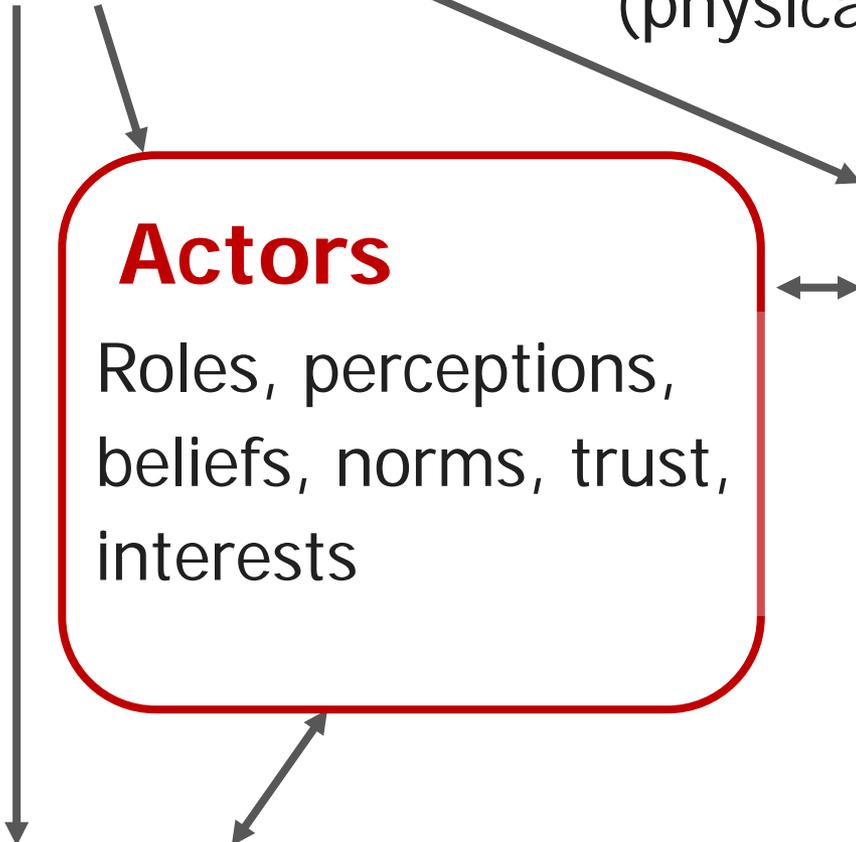
$$P(DM \text{ success}) = f(S, P, M, a_i, MMD).$$

$, a_i = 1 \dots 4$

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

Scholten L, Kunz N., Ingold K, Oberg, G. (in preparation). *An analytic framework to identify barriers to sustainable urban water systems – the role of decision process, actors, and their collaboration networks.*

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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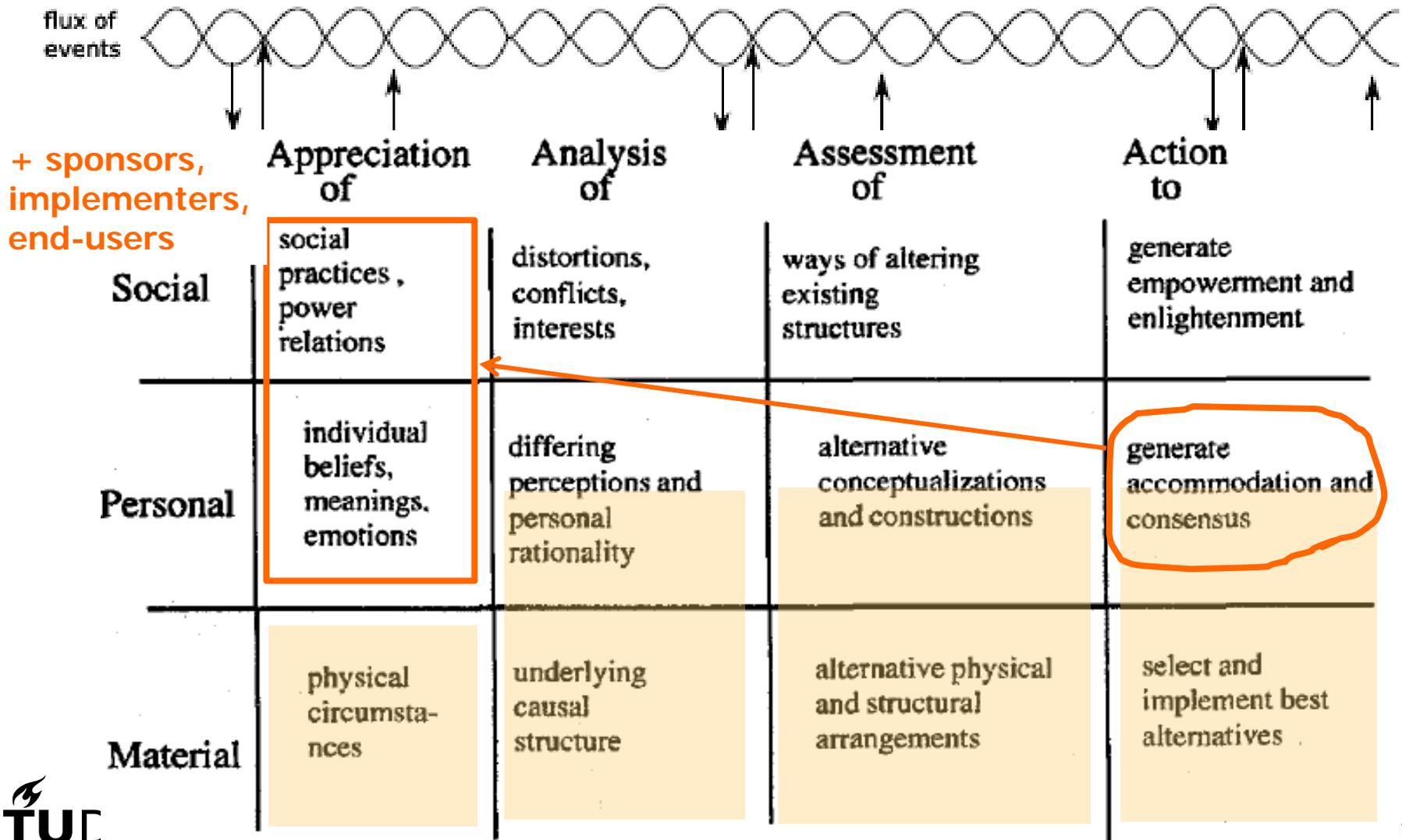
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Recommendations mapped to M&B's framework

+ sponsors,
implementers,
end-users

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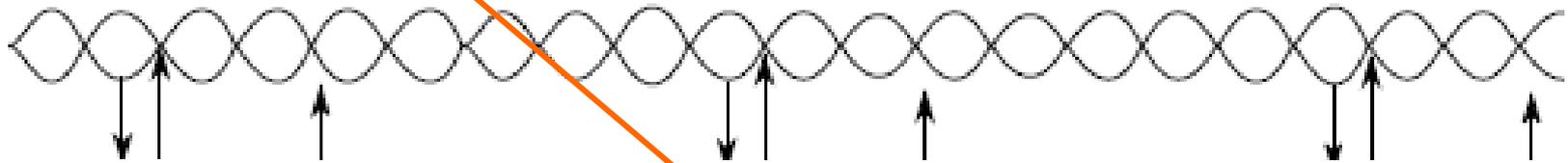
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Recommendations mapped to M&B's framework

+ empower facilitators

flux of events



+ sponsors,
implementers,
end-users

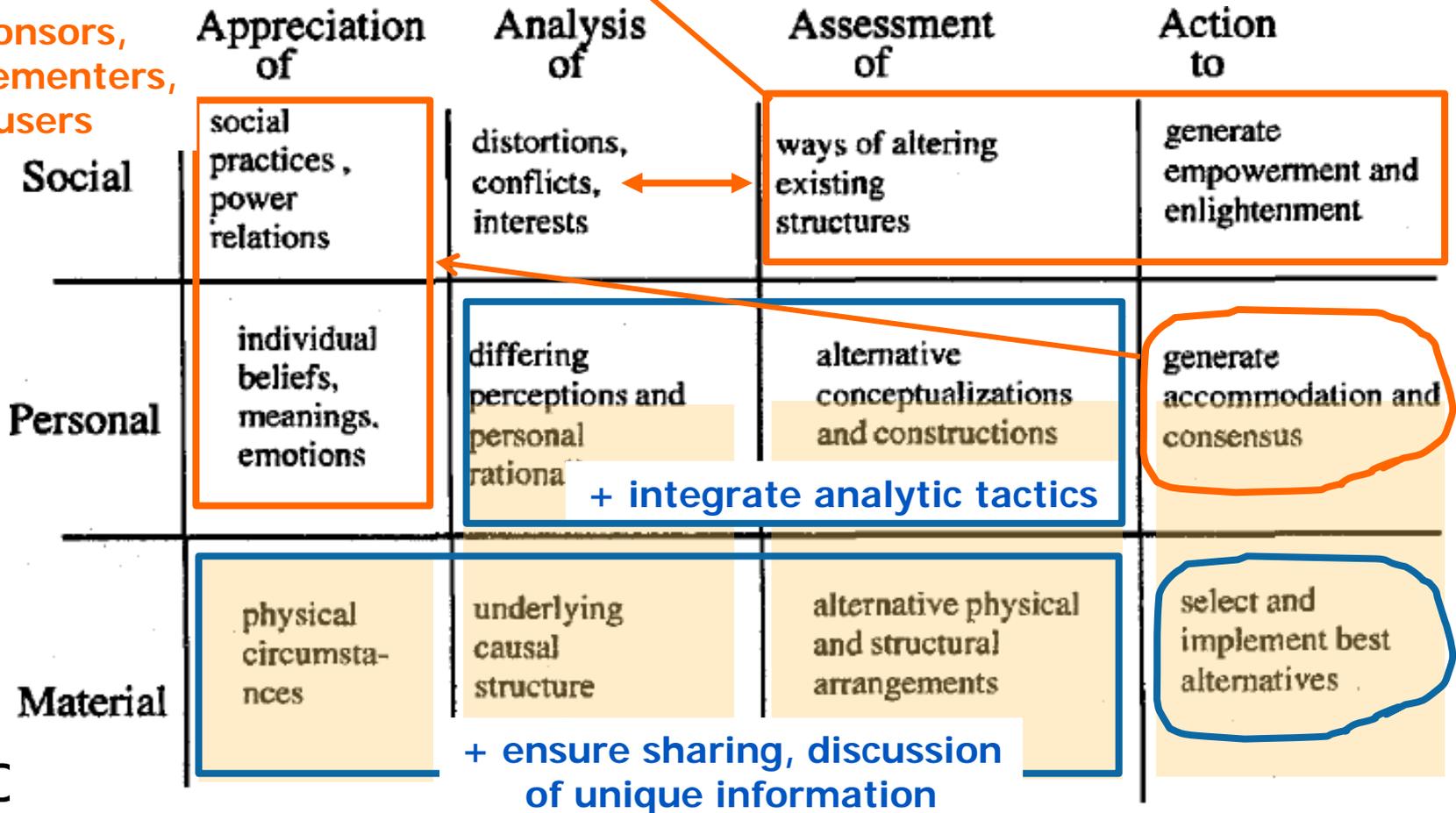
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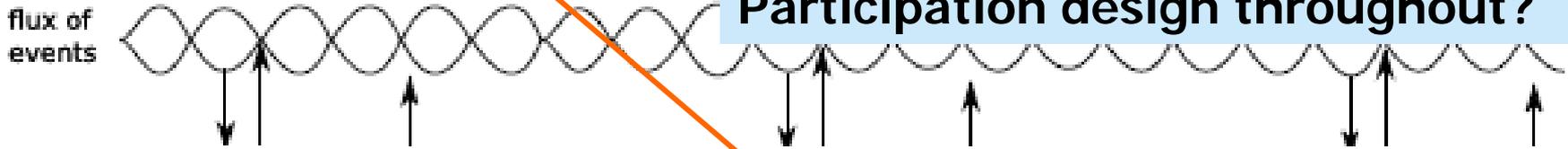


Recommendations mapped to M&B's framework

+ empower facilitators

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

+ sponsors,
 implementers,
 end-users



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+ integrate analytic tactics

+ ensure sharing, discussion of unique information

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.



References (1)

- Bryson, J.M. (2004) What to do when Stakeholders matter. *Public Management Review* 6(1), 21-53.
- Bryson, J.M., Quick, K.S., Slotterback, C.S. and Crosby, B.C. (2013) Designing Public Participation Processes. *Public Administration Review* 73(1), 23-34.
- Bryson, J.M., Crosby, B.C. and Stone, M.M. (2015) Designing and Implementing Cross-Sector Collaborations: Needed and Challenging. *Public Administration Review* 75(5), 647-663.
- Davis, J.H. (1996) Understanding group behavior: Consensual action by small group. Witte, E. and Davis, J.H. (eds), pp. 35-59, Erlbaum, NJ.
- De Bruijn, H., Ten Heuvelhof, E. and In 't Veld, R. (2010) *Process Management - Why Project Management Fails in Complex Decision Making Processes*, Springer.
- Howick, S. and F. Ackermann (2011), Mixing OR methods in practice: Past, present and future directions. *European Journal of Operational Research*. 215(3): p. 503-511.
- Ingold, K. and Leifeld, P. (2014) Structural and Institutional Determinants of Influence Reputation: A Comparison of Collaborative and Adversarial Policy Networks in Decision Making and Implementation. *Journal of Public Administration Research and Theory*.

References (2)

- Kameda, T., Ohtsubo, Y. and Takezawa, M. (1997) Centrality in sociocognitive networks and social influence: An illustration in a group decision-making context. *Journal of Personality and Social Psychology* 73(2), 296-309.
- Kerr, N.L. and Tindale, R.S. (2004) Group performance and decision making. *Annual Review of Psychology* (55), 623-655.
- Mingers, J. and J. Brocklesby (1997)/ Multimethodology: Towards a Framework for Mixing Methodologies. *Omega*. 25(5): p. 489-509.
- Mingers, J. (2000) Variety is the spice of life: combining soft and hard OR/MS methods. *International Transactions in Operational Research*. 7(6): p. 673-691.
- Mingers, J. (2003, A classification of the philosophical assumptions of management science methods. *Journal of the Operational Research Society*, 2003. 54(6): p. 559-570.
- Munro, I. and J. Mingers (2002). The use of multimethodology in practice—results of a survey of practitioners. *Journal of the Operational Research Society*. 53(4): p. 369-378.
- Nutt, P. (2002) Making strategic choices. *Journal of Management Studies* 39(1), 67-96.

References (3)

- Nutt, P.C. (2007) Examining the link between plan evaluation and implementation. *Technological Forecasting and Social Change* 74(8), 1252-1271.
- Nutt, P.C. (2008) Investigating the success of decision making processes. *Journal of Management Studies* 45(2), 425-455.
- Pollack, J., *Multimethodology in Series and Parallel: Strategic Planning Using Hard and Soft OR*. *The Journal of the Operational Research Society*, 2009. 60(2): p. 156-167.
- Provan, K.G. and Kenis, P. (2008) Modes of network governance: Structure, management, and effectiveness. *Journal of Public Administration Research and Theory* 18(2), 229-252.
- Smith, A., Stirling, A. and Berkhout, F. (2005) The governance of sustainable socio-technical transitions. *Research Policy* 34(10), 1491-1510.
- Tindale, R.S. and Kameda, T. (2000) 'Social Sharedness' as a Unifying Theme for Information Processing in Groups. *Group Processes & Intergroup Relations* 3(2), 123-140.