



Evaluating Complex Infrastructure Projects

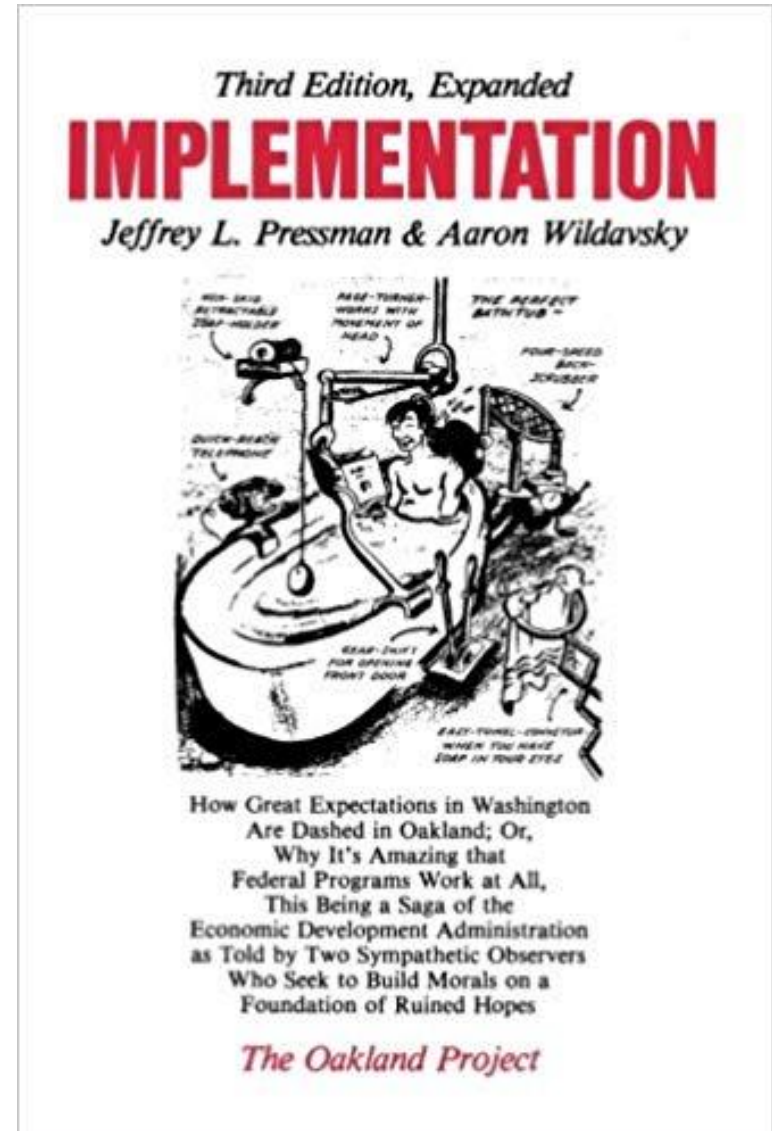
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Learning is key

*Learning is the key to both implementation and evaluation. We **evaluate to learn**, and we **learn to implement**.*



Learning is difficult

*The **successful transfer of learning across projects** has been a long-held desire by project professionals. The **difficulties in achieving this activity** are created by the very nature of projects themselves: their separation from a 'permanent' organization and their **uniqueness**. (...).*

Evaluation: two perspectives

- › Ex-ante: cost-benefit analysis, multi-criteria analysis, environmental impact assessment, etc.
- › Ex-post:
 1. Accountability
 2. Learning

Accountability

> Risk perspective

- **Planning as calculating**; objective probabilities can be calculated for project implementation processes...
- ...which implies that actors can **strategically miscalculate** (cf. Flyvbjerg)
- Focus: evaluation is used to **hold actors accountable** for project performance (which is of course important)

Learning

> **Uncertainty perspective**

- Reality is **fundamentally uncertain**; objective probabilities *cannot* be calculated for project implementation processes...
- ...which implies that projects are 'complex wholes' interacting with their environment; hence, severe **limitations to project steering**
- Focus: how can we **learn** in and from projects?

However, evaluation

- > Happens too little...
- > Is not done **systematically**...
- > Is not done **comparatively**...
 - How then can projects **learn from each other**?
 - How can lessons learned be **institutionalized**?

Why these problems?

- > **Insufficient data** or resources
- > Managers **rush from project to project** (cf. projectification)
- > **Methodological deficiencies**: mismatch between the complexity of projects and the methods used to evaluate them!
 - The **projects are complex**, but the evaluation **methods assume simplicity** (e.g., Flyvbjerg)

What is the complexity?

1. Non-decomposability
2. Contingency
3. Non-compressibility
4. Time-asymmetry

Non-decomposability

Reality

- › Project implementation and outcomes **cannot be understood by decomposing** the project into individual parts, and studying *only* these parts
- › Instead, reality is emergent; **outcomes are caused by the *interaction* between parts**

Implication for evaluation

- › Focus on how ***configurations*** (i.e., combinations of parts) explain outcomes

Contingency

Reality

- › Project implementation and outcomes **do not occur in a vacuum but in a context**
- › This context is **unique** (e.g., social environment)...
- › ...but also **similar** across projects (e.g., laws and regulations, global trends)

Implication for evaluation

- › Management strategies that are effective in one situation/project, may not be effective in another
- › Assess the role of context: ***simultaneously identify unique and similar aspects across cases***

Non-compressibility

Reality

- › Reality is **inevitably compressed** (simplified) and actors **therefore draw boundaries**
- › Because they have different backgrounds and interests (e.g., public-private), they **draw *different boundaries***

Implication for evaluation

- › This gives rise to ambiguities and conflicts
- › **Include the different actor perspectives** in explaining outcomes (using case-based, qualitative methods)

Time-asymmetry

Reality

- › Project implementation and outcomes are **unidirectional** (irreversible)

Implication for evaluation

- › **Perfect prediction is not possible**
- › Attention to the **dynamics** of project implementation and **appreciate uncertainty**

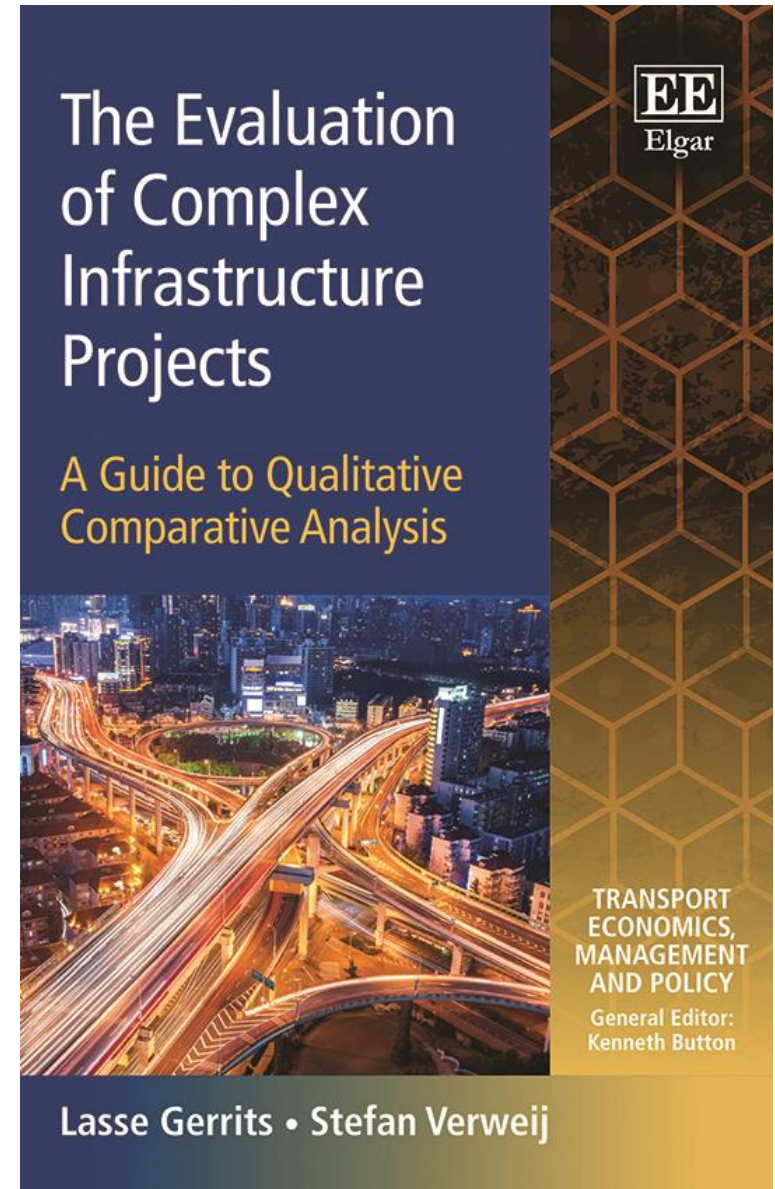
Summary

Implications for evaluation

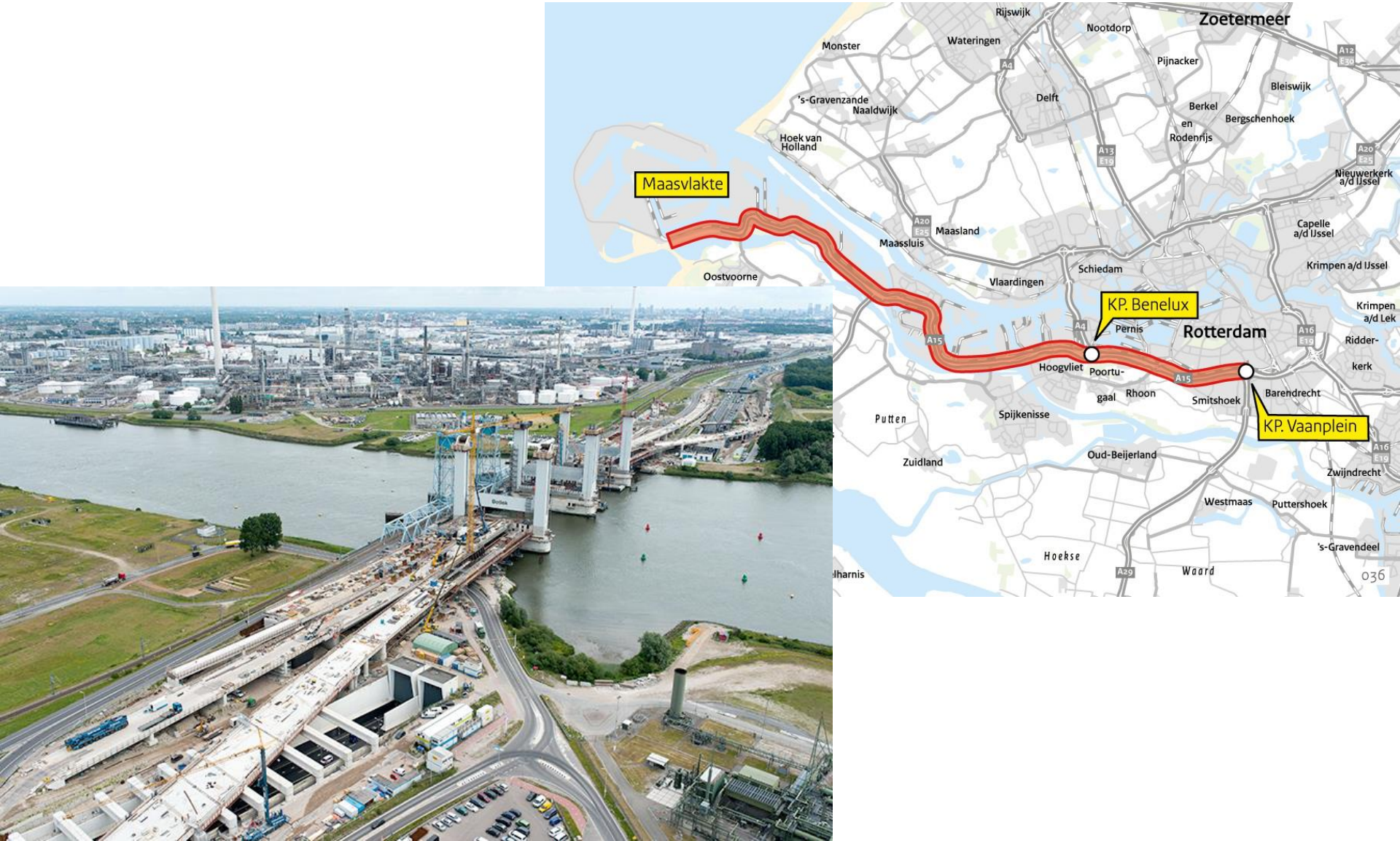
- ✓ Focus on how *configurations* explain outcomes
- ✓ Assess the role of context: *simultaneously identify unique and similar aspects across cases*
- ✓ *Include the different actor perspectives in explaining outcomes*
- ✓ Attention to the *dynamics* of project implementation and *appreciate uncertainty*

Method: QCA

Qualitative
Comparative
Analysis



Example: A15 MaVa



Example: A15 MaVa

| | <u>Case-ID</u> | <u>EVENT</u> | <u>MAN</u> | <u>COOP</u> | <u>SATIS</u> |
|--|----------------|--------------|------------|-------------|--------------|
| <u>Uncertainty</u> 20 cases of "events" during project implementation | CAB1 | 0 | 0 | 1 | 1 |
| | CIT1 | 1 | 1 | 1 | 1 |
| | CIT2 | 1 | 1 | 0 | 1 |
| | CIT3 | 1 | 0 | 0 | 0 |
| <u>Context</u> Events occurring in the project environment | CIT4A | 1 | 0 | 0 | 0 |
| | CIT4B | 1 | 0 | 1 | 0 |
| | DOW | 0 | 0 | 0 | 0 |
| | EXP | 0 | 0 | 0 | 0 |
| | GRO | 0 | 0 | 0 | 0 |
| | HBR1 | 1 | 0 | 1 | 0 |
| <u>Management</u> Management strategies and public- private cooperation | HBR2 | 1 | 1 | 0 | 1 |
| | HBR3 | 1 | 0 | 1 | 0 |
| | LEI | 1 | 1 | 1 | 1 |
| | MUN1 | 1 | 0 | 1 | 0 |
| | MUN2 | 1 | 0 | 0 | 0 |
| | PRO | 1 | 1 | 1 | 1 |
| <u>Outcome</u> Different perspectives → "satisfaction" | PRV1 | 1 | 1 | 0 | 1 |
| | PRV2 | 1 | 1 | 0 | 1 |
| | RWS1 | 1 | 0 | 0 | 0 |
| | RWS2 | 1 | 0 | 1 | 0 |

Example: A15 MaVa

- > Study this table with your neighbor (5-10 min.)
- > Logically compare rows where possible
- > Then formulate at least three lessons learnt

Table 11.3 Truth table

| <i>EVENT</i> | <i>MAN</i> | <i>COOP</i> | <i>SATIS</i> | <i>Cases</i> |
|--------------|------------|-------------|--------------|-------------------------------|
| 0 | 0 | 1 | 1 | CAB1 |
| 1 | 1 | 1 | 1 | CIT1, LEI, PRO |
| 1 | 1 | 0 | 1 | CIT2, PRV2, HBR2, PRV1 |
| 0 | 0 | 0 | 0 | DOW, GRO, EXP |
| 1 | 0 | 0 | 0 | CIT3, CIT4A, MUN2, RWS1 |
| 1 | 0 | 1 | 0 | CIT4B, RWS2, HBR1, HBR3, MUN1 |

Example: A15 MaVa

Table 11.3 Truth table

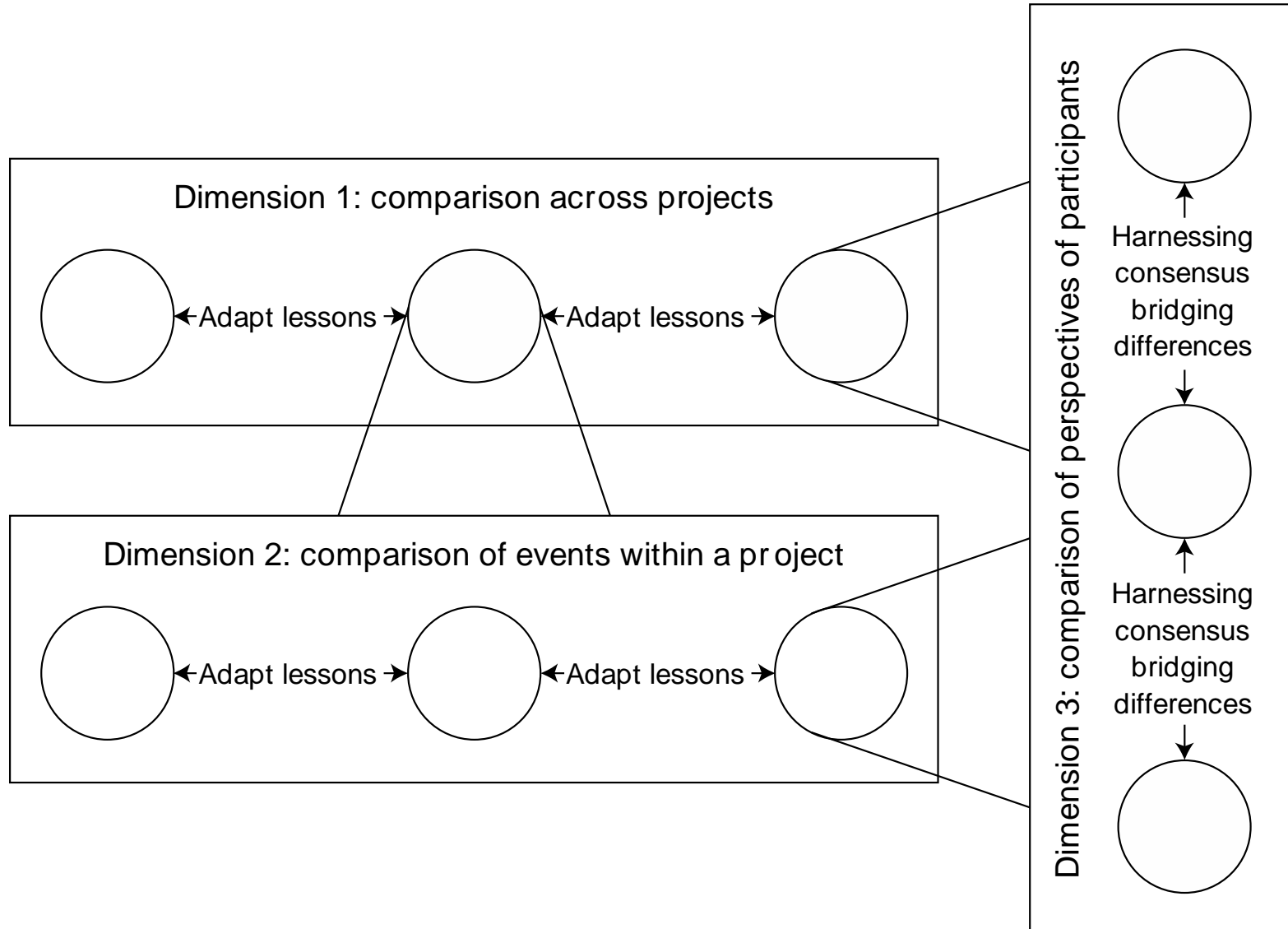
| EVENT | MAN | COOP | SATIS | Cases |
|-------|-----|------|-------|-------------------------------|
| 0 | 0 | 1 | 1 | CAB1 |
| 1 | 1 | 1 | 1 | CIT1, LEI, PRO |
| 1 | 1 | 0 | 1 | CIT2, PRV2, HBR2, PRV1 |
| 0 | 0 | 0 | 0 | DOW, GRO, EXP |
| 1 | 0 | 0 | 0 | CIT3, CIT4A, MUN2, RWS1 |
| 1 | 0 | 1 | 0 | CIT4B, RWS2, HBR1, HBR3, MUN1 |

The table is annotated with colored boxes and arrows:

- Green boxes highlight rows 1, 2, and 3, with a '3' in the MAN column of row 2 and a '4' in the COOP column of row 1.
- Red boxes highlight rows 4, 5, and 6, with a '2' in the COOP column of row 5 and a '1' in the MAN column of row 6.
- Red arrows point from the '1' in row 6, MAN to the '3' in row 2, MAN; from the '0' in row 5, COOP to the '2' in row 5, COOP; and from the '0' in row 4, SATIS to the '1' in row 1, SATIS.

- › Two strategies result in **low satisfaction (1,2)**
- › Two strategies result in **high satisfaction (3,4)**
- › In the case of events type [1], change your MAN-strategy from [0] to [1] (**1→3**)
- › In the case of MAN type [0], change your COOP-strategy from [0] to [1] (**2→4**)

Extending the evaluation



The example highlights

- › Focus on **both unique and similar aspects** of cases
- › **Lesson transfer (learning)** from case-to-case
- › QCA **meets the 4 requirements** to a large extent

- › Large **opportunities for evaluation** (e.g., Rijkswaterstaat Project Database)...
- › ...but **need to be seized more!**

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