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Understanding Strategic Behaviour in Real Estate Decision-making by Enhancing Collaborative Behaviour through Decision Support Systems

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Introduction

**Research
Methodology**

Results

**Discussion and
Conclusions**

Introduction

Research problem and aim



Problem: Limited understanding of how Strategic Behaviour (SB) operates in Decision Support Systems (DSS).

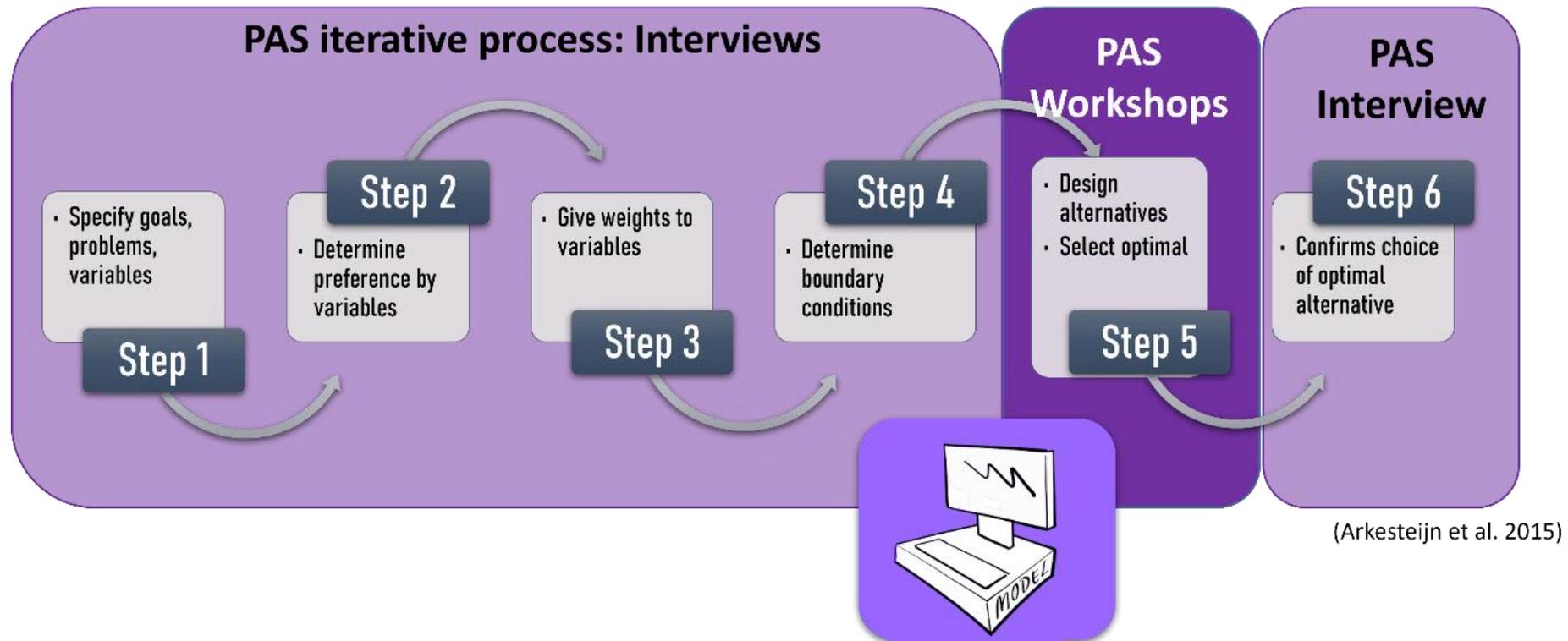


Gap: Lack of empirical observation of SB in real DSS using a literature-based conceptual SB observation framework.



Aim: Understanding the SB in DSS-based and non-DSS-based environments and validation of the literature-based conceptual SB observation framework.

Selected DSS: Preference-based Accommodation Strategy (PAS)

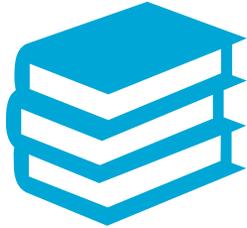


PAS process (simplified version) (Arkesteijn, 2015)



Research Methodology

Research methodology



Data collection:

Semi-structured interviews for understanding the current decision-making process

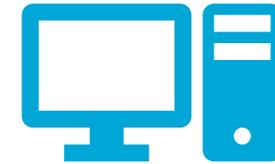
+ Understanding the DSS-based decision-making process via the PAS activities

+ Observations + Documents review



Data analysis:

Literature-based framework
+ thematic deductive codes (framework)



Ethical considerations

HREC at TU Delft
+ Internal confirmation at NLOG

Case study: A strategic, multi-actor real estate decision problem at NLOG

NLOG*

Understanding the current (traditional) decision-making and SB within it

Understanding the PAS-based decision-making and SB within it

**NLOG is a term that is used in this presentation to refer to the case (a public real estate organisation))*



*Results- Current (Traditional)
Decision-making Process at NLORG*

Mapping the framework to NLORG's current decision-making environment (Non-DSS)

Framework step	Theme/Code
1. Detect interdependence (rationale: goals and motivation)	Interdependent but segmented so often unaware of each other's (goals)
2. Determine strategic approach	Power Dynamics, Exclusion, Self-interest
3. Observe strategic actions	Lobbying, Late Interventions, Goal Framing
4. Analyse strategic use of resources	Information Asymmetry, Lack of Objectivity
5. Interpret incentives	Low Transparency, Low Trust, Defensive Culture

Results- PAS-based Decision-making Process at NLORG

Mapping the framework to NLOGG's current decision-making environment (PAS)

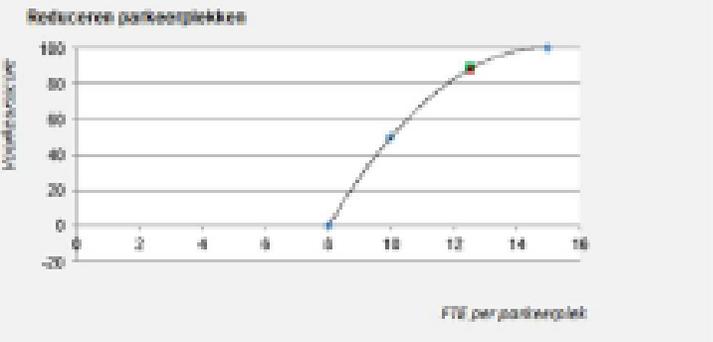
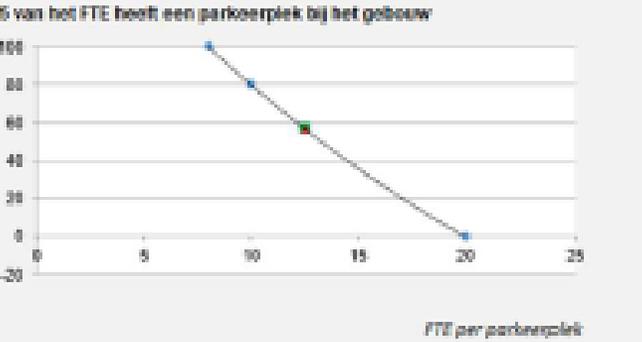
Framework step	PAS activity and conclusion
1. Detect interdependence (rationale: goals and motivation)	Interdependence analysed (step 1 to 4 PAS) and shown in 42 conflicts and overlapping goals
2. Determine strategic approach	Stakeholders cooperate or protect their position by adjusting preferences strategically or clarifying their rationale in group discussion
3. Observe strategic actions	66 strategic actions recorded (PAS Step 4)
4. Analyse strategic use of resources	Stakeholders used model features to influence decisions based on equal access (PAS Step 4)
5. Interpret incentives	Stakeholders reflected on motivations: confirmed strategic edits, or emphasized honesty. PAS led to increased trust and perceived fairness (PAS Step 6)

Step 1- Detect interdependent actors (rationale: goals and motivation): 42 conflicts

Supported by: Interview 1 (PAS Activity 1)

Conflicts of interest

In total 42 conflicts of interests were identified.

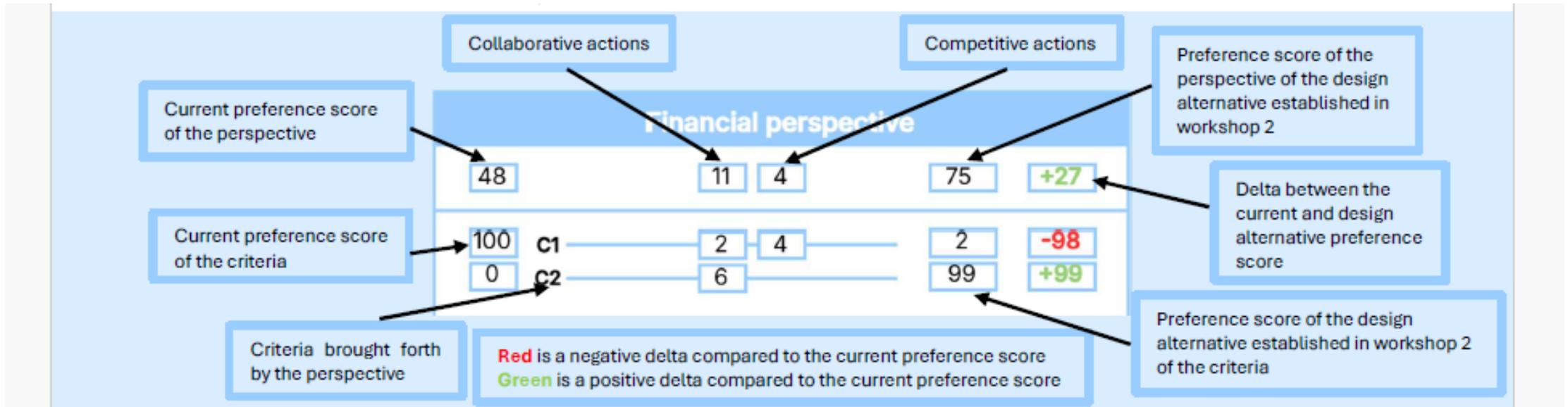
Strategic perspective	Technical perspective																				
 <p>Reduceren parkeerplekken</p> <p>Y-axis: 100, 80, 60, 40, 20, 0, -20</p> <p>X-axis: 0, 2, 4, 6, 8, 10, 12, 14, 16</p> <p>FTE per parkeerplek</p> <table border="1"><caption>Data for 'Reduceren parkeerplekken'</caption><thead><tr><th>FTE per parkeerplek</th><th>Value</th></tr></thead><tbody><tr><td>8</td><td>0</td></tr><tr><td>10</td><td>50</td></tr><tr><td>12</td><td>90</td></tr><tr><td>14</td><td>100</td></tr></tbody></table>	FTE per parkeerplek	Value	8	0	10	50	12	90	14	100	 <p>0,5 van het FTE heeft een parkeerplek bij het gebouw</p> <p>Y-axis: 100, 80, 60, 40, 20, 0, -20</p> <p>X-axis: 0, 5, 10, 15, 20, 25</p> <p>FTE per parkeerplek</p> <table border="1"><caption>Data for '0,5 van het FTE heeft een parkeerplek bij het gebouw'</caption><thead><tr><th>FTE per parkeerplek</th><th>Value</th></tr></thead><tbody><tr><td>8</td><td>100</td></tr><tr><td>10</td><td>80</td></tr><tr><td>12</td><td>60</td></tr><tr><td>20</td><td>0</td></tr></tbody></table>	FTE per parkeerplek	Value	8	100	10	80	12	60	20	0
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8	100																				
10	80																				
12	60																				
20	0																				
Reducing parking places	Increasing parking places																				
Both are defined with the same unit but with different interests in them. This results in a conflict of interest on the basis of the goal they want to achieve with the parking places																					

Step 3- Observe strategic actions

Supported by: Workshop 2 (PAS Activity 4)

66 Strategic Actions Identified:

- Classified as **Competitive** or **Collaborative**
- Mapped against preference curves



51	60	6	80	+29	
Financial perspective					
48	11	4	75	+27	
100	C1	2	4	2	-98
0	C2	6		99	+99
0	C3	2		100	+100
30	C4	1		60	+30
80	C5	0		83	+3
Technical perspective					
45	12	1	89	+44	
25	C1	1		100	+75
72	C2	0		72	0
57	C3	0		57	0
47	C4	8	1	90	+43
42	C5	3		94	+52
Strategic perspective					
35	19	1	72	+37	
72	C1	2		100	+28
7	C2	0		57	+50
89	C3	0		89	0
60	C4	0		78	+18
0	C5	0		0	0
90	C6	0		100	+100
0	C7	2		100	+100
46	C8	4		58	+12
2	C9	3		42	+40
0	C10	0		0	0
46	C11	4	1	86	+40
0	C12	0		0	0
50	C13	2		100	+50
34	C14	2		100	+66
User perspective					
74	18		82	+8	
43	C1	10		86	+43
59	C2	0		61	+3
70	C3	0		70	0
100	C4	0		100	0
70	C5	1		87	+17
70	C6	1		94	+24
66	C7	1		76	+10
78	C8	0		78	0
93	C9	0		93	0
66	C10	4		100	+34
70	C11	0		76	+6

An example Fully Collaborative (Non-Strategic) (1/11)

"If we are trying to reach our goals, it might be a better choice to go for an intervention advancing nature inclusivity and climate adaptivity. Especially with this building, since it's not a long-term asset... And maybe we can also help the budget by choosing only one of them."

– User perspective

"Look, this even enhances the score by 3."

– User perspective

a goal not represented in their own preference curve

Step 3- Observe strategic actions

Supported by: Workshop 2 (PAS Activity 4)

- While 11 actions were fully collaborative, **an additional 60 actions** were classified as collaborative SB.
- These actions were analyzed using **six collaborative characteristics** from the literature.

Characteristics	Times recognized
Information sharing	50
Public testing of assumptions	46
Openness on goals	40
Invitation to other perspectives	52
Concern of mutually beneficial solution	35
Understanding of other ones goals	43



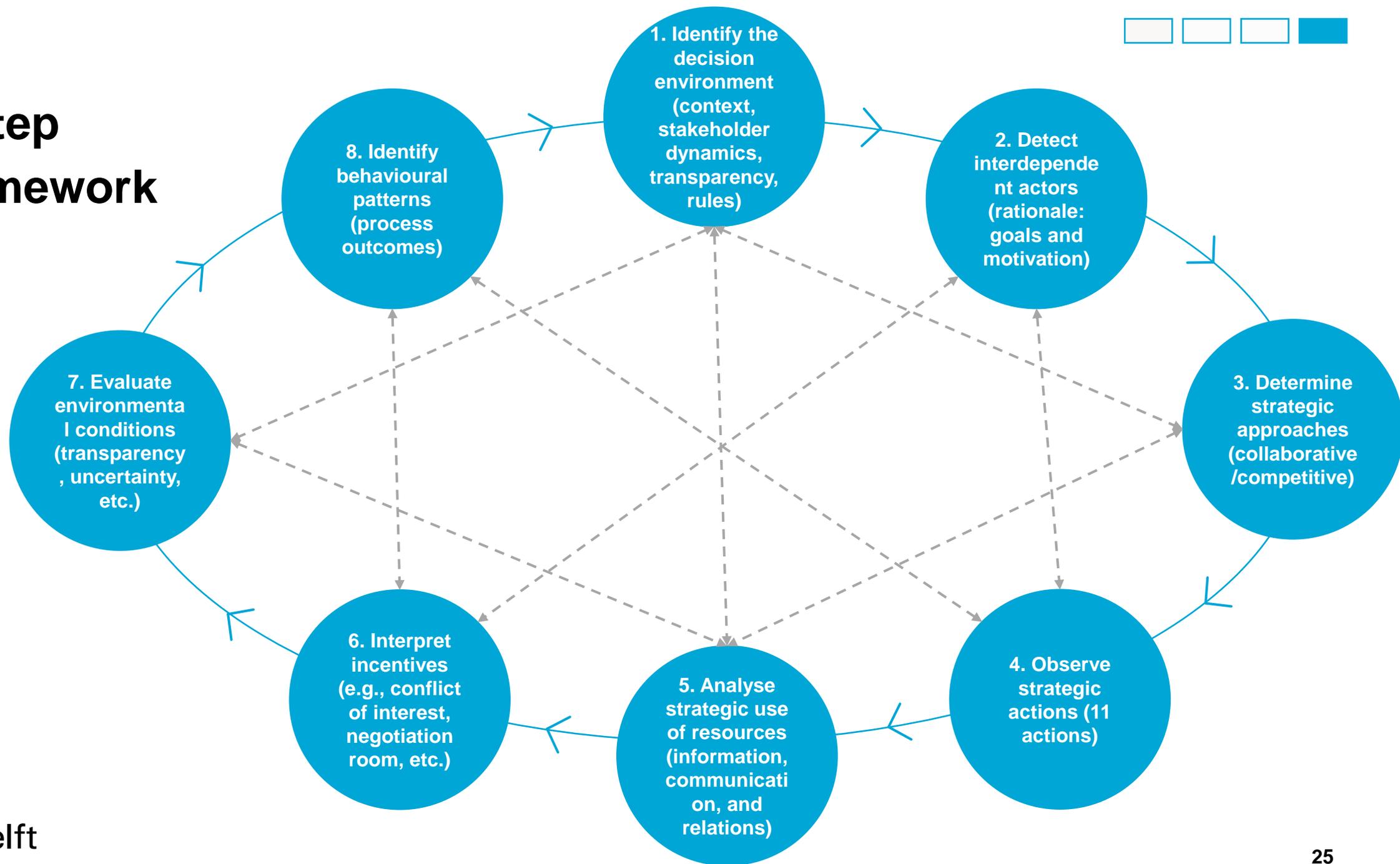
Comparison DSS-based environment & current decision-making process

Decision environment structure shapes the visibility, nature, and outcomes of strategic behaviour.

Main Differences – DSS (PAS) vs. Traditional

Aspect	Traditional Decision-Making	PAS-Supported Decision-Making
Structure	Informal, fragmented	Structured, tool-supported
Transparency	Limited, hidden preferences	High, with visualized goals and trade-offs
SB Detection	Difficult to trace	Observable and codable via model use and recordings
Influence Mechanism	Power-based or informal lobbying	Model feedback and explicit goals
Risk	Hidden power imbalance	Strategic gaming during individual phases

8-step framework



Key points and takeaways

- *Current processes more competitive SB and in PAS more collaborative SB*
- *Structured DSS environments (like PAS) improve transparency, collaboration, and traceability of strategic behaviour (SB), but do not eliminate strategic system gaming.*
- *Compared to traditional processes, PAS made goals visible, encouraged reflection, and shifted behaviour from informal lobbying to open negotiation and shared learning.*



Limitations

Transparency tools alone are insufficient without group accountability and accessible interfaces. Hidden asymmetries may persist.

Involvement of the account manager of the users but not users of the respective organisations



Recommendations for future research

Testing and validating the 8-step framework using PAS or other DSS in other context.

References of the paper

SCAN THE QR CODE TO DOWNLOAD THE REFERENCE LIST



Thanks for your attention!