Planning support systems in urban development in the Netherlands

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AMS
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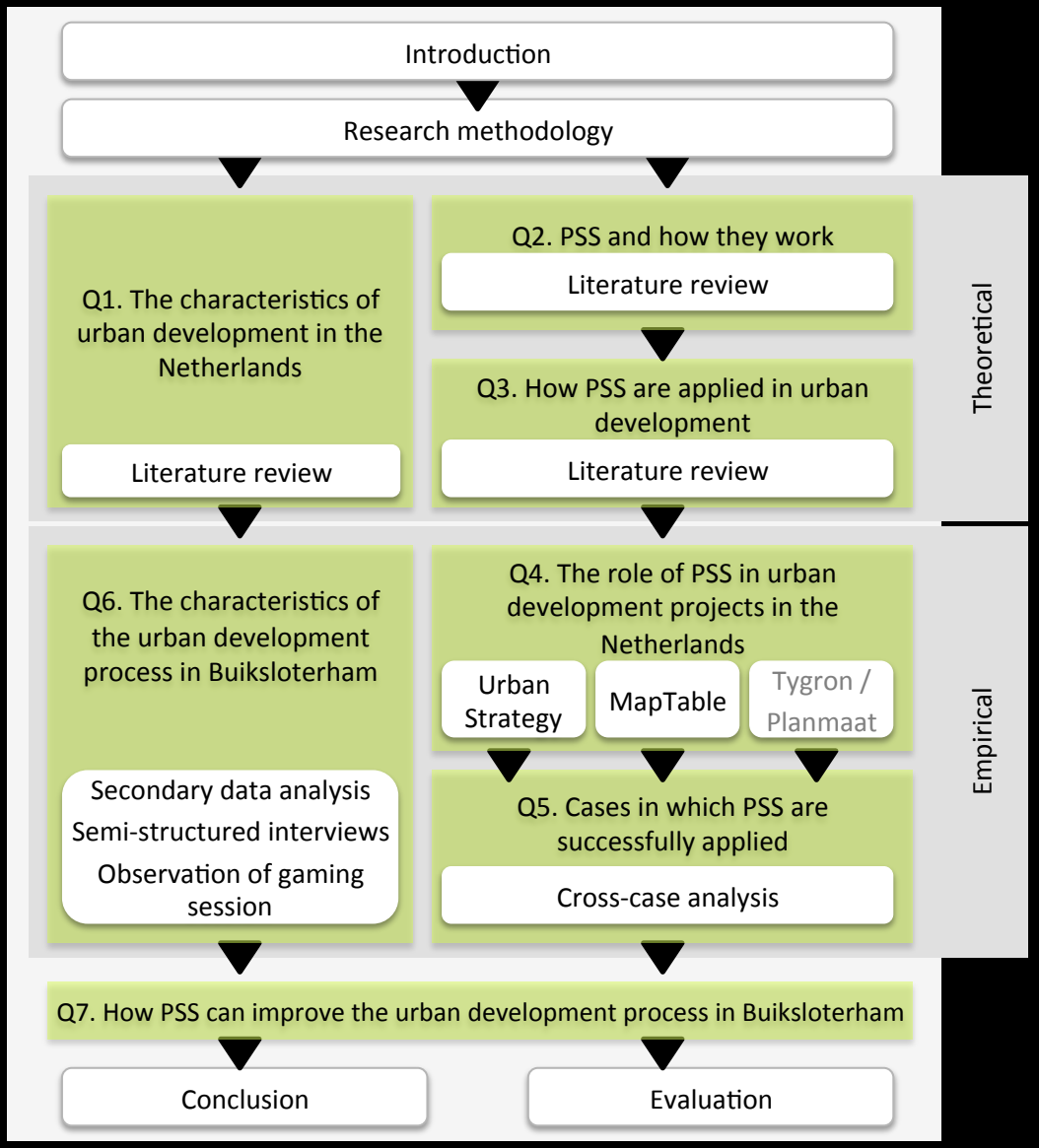
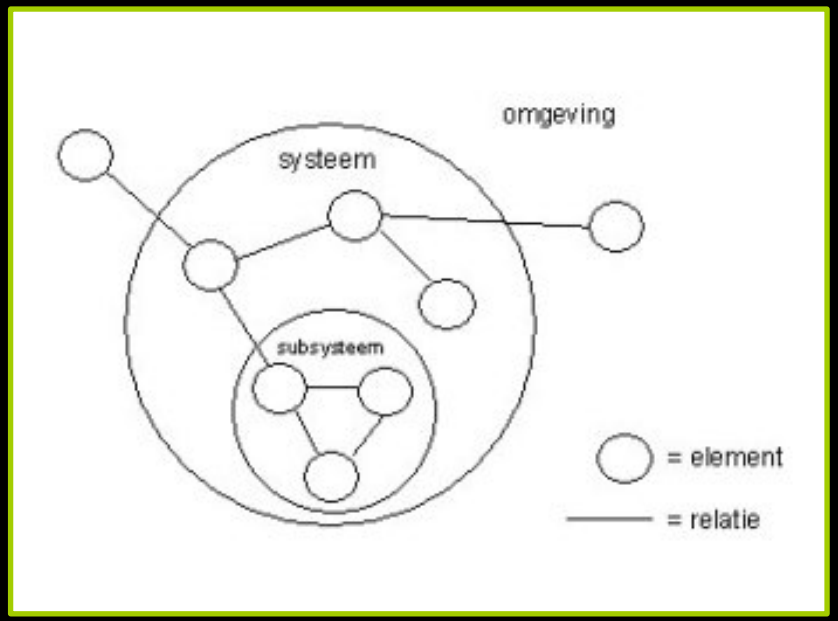
Presentation contents & research design



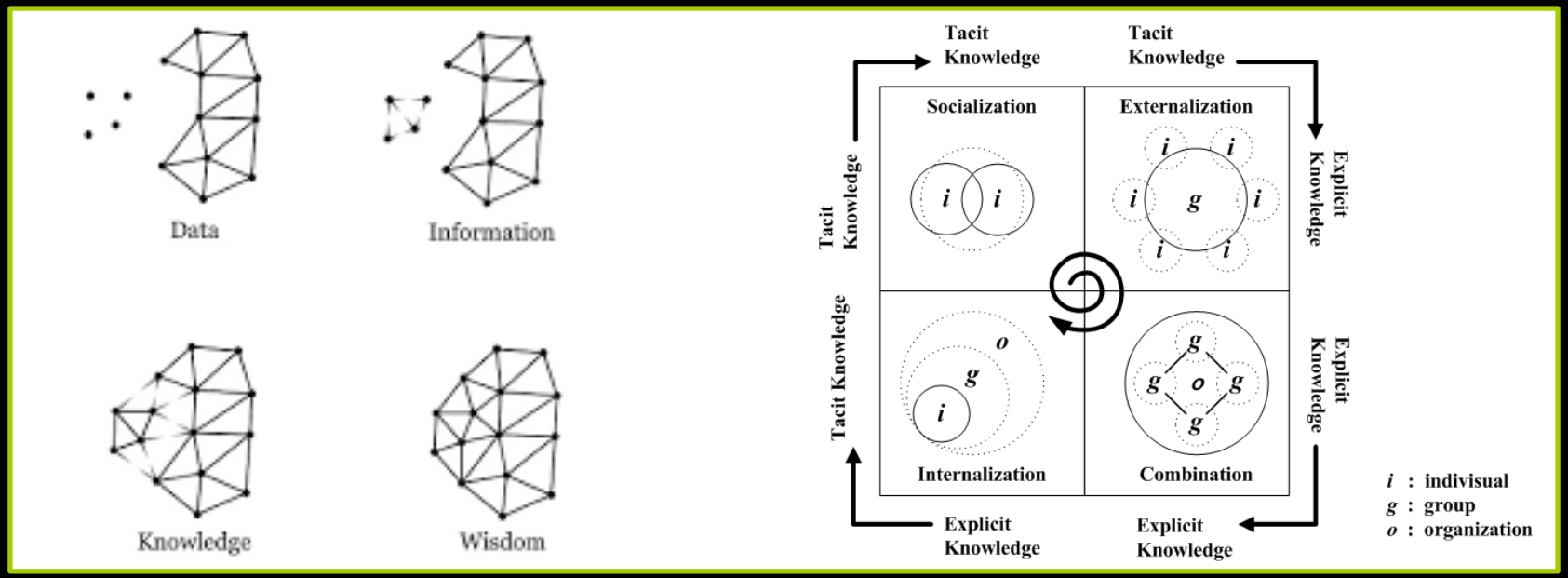
Theoretical framework

- Systems thinking theory
- Hard systems methodology vs. soft systems methodology (Checkland, 1981)
- Types of systems: deterministic, animated, social, ecological systems (Achoff, 1999)
- Type of subsystems: aspect system, component system, phase system (De Leeuw, 2002)



Theoretical framework

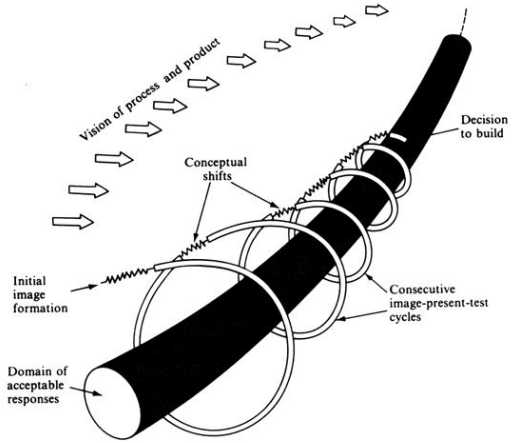
- Design thinking and decision-making: open and creative process
- Tacit and explicit knowledge
- PSSs process data in order to create information, when stakeholders internalize this information, new knowledge will be generated.
- New knowledge can change the perspective of stakeholders upon the spatial issue



Theoretical framework

- A changed perspective of stakeholders, can lead to changed ambitions
- The design process is an iterative learning process
- The design process consists of divergent and convergent phases
- Soft systems approach suits the human centred approach of design thinking

The Spiral Model of Zeisel



Design development spiral

Findings

1. What are characteristics of the decision-making process in urban area development in the Netherlands? [literature review]

- Level of scale
- Multi-actor & multi-disciplinary: different interests, objectives &backgrounds
- Long-term
- High investments
- Dynamic context

Findings

2. What are PSS and how do they work? [literature review]

- Based on GIS and MCA;
- Different stakeholders use PSS in a different way;
- Different PSS can support different tasks: analysis, validation, exploration, design, evaluation, and negotiation;
- PSS can be descriptive, prescriptive, and predictive;
- PSS are based on a heuristic design method;
- PSS has evolved from technocratic top-down decision systems to participatory planning systems.

Findings

3. How are PSSs applied in urban area development? [literature review]

- Range of different tools; different purposes; suitable for different phases;
- Still not widely applied in practice;
- Aim to reach consensus;
- Adaption framework Willows & Cornell is suitable for iterative design processes;

Findings

4. What is the role of PSS in urban area development projects in the Netherlands in relation to cases of Urban Strategy and the Maptable?

[case studies]

Findings

4. What is the role of PSS in urban area development projects in the Netherlands in relation to cases of Urban Strategy and the Maptable?

[case studies]

Urban Strategy

GVU

SUMP

Findings

4. What is the role of PSS in urban area development projects in the Netherlands in relation to cases of Urban Strategy and the Maptable?

[case studies]

STRENGTHS

- Calculation model:
  - Reliable statutory calculation methods;
- Speed;
- Visualizing relation between different themes.

WEAKNESSES

- Focus on 'grey' environmental themes;
- Accessibility: available via TNO;
- Data intensive: large preparation time needed;
- Level of interactivity:
  - Limited user-friendliness: operator is needed.

OPPORTUNITIES

- Rule-of-thumb indicators;
- Online availability;
- Internationalization;
- Maturing of the software.

THREATS

- Competitive tools;
- Awareness of the tool of potential users;
- Accustomed to traditional workflow or seen as threat to their job;
- Fear for differences in results and rejection of the results;
- Seen as a limitation of the design freedom.

Findings

4. What is the role of PSS in urban area development projects in the Netherlands in relation to cases of Urban Strategy and the Maptable?

[case studies]

MapTable

Kwadrant in Maarssenbroek

Woudenberg Oost

Findings

4. What is the role of PSS in urban area development projects in the Netherlands in relation to cases of Urban Strategy and the Maptable?

[case studies]

MapTable

Kwadrant in Maarssenbroek

Woudenberg Oost

STRENGTHS	WEAKNESSES
• User-friendliness: interactive setting; • Design possibilities; • Tool draws positive attention.	• Calculation speed; • Compactness: size & weight; • Preparation time.
OPPORTUNITIES	**THREATS**
• Flexibility; • Streamlining different programs and data sources; • Portability: lighter and thinner; • Greater role citizen participation.	• Risk of technical failure; • Power relations: fear for decreased negotiation position; • Transition of different stakeholders.

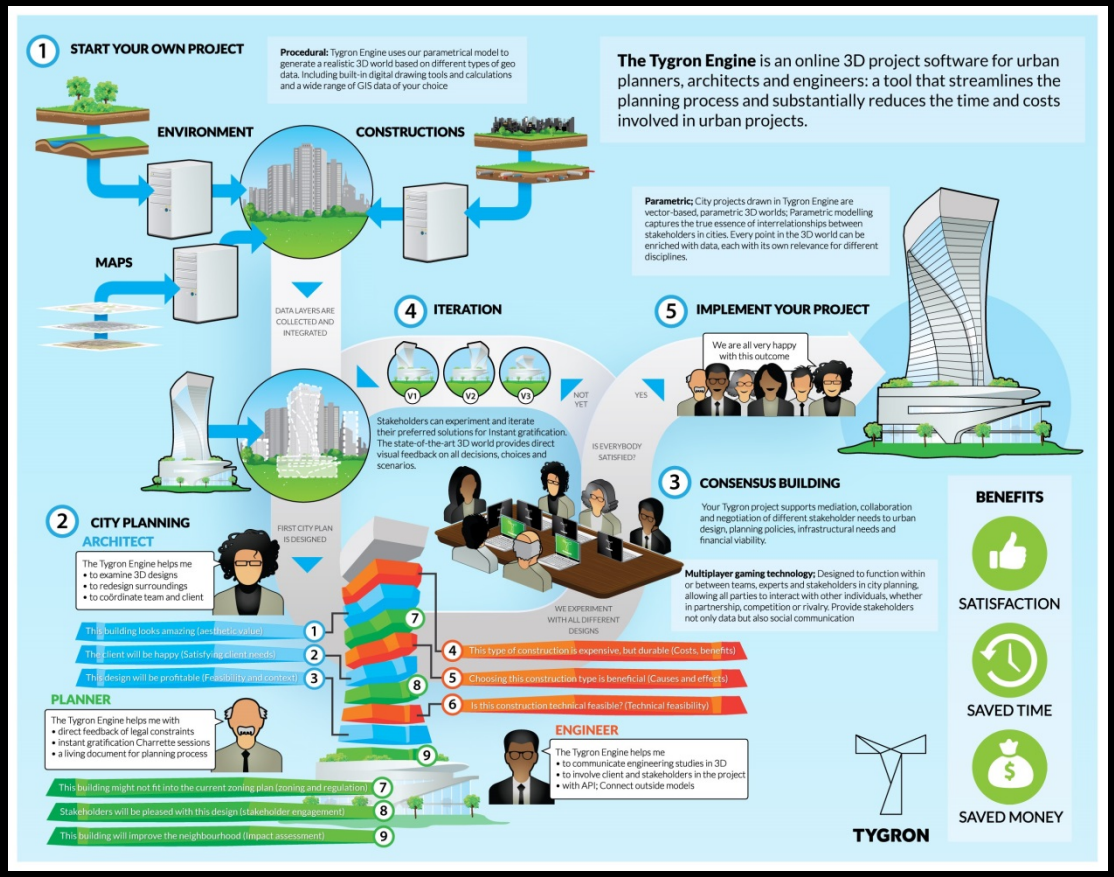
Findings

4. What is the role of PSS in urban area development projects in the Netherlands in relation to cases of Urban Strategy and the Maptable?

[case studies]

Tygron

Planmaat



Findings

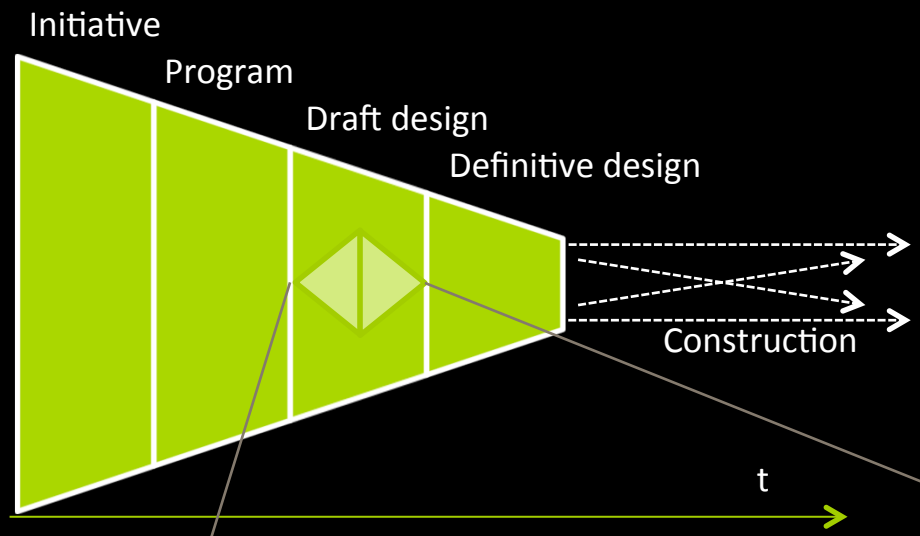
5. In which cases is the application of PSSs perceived useful by its users and developers? [case studies]

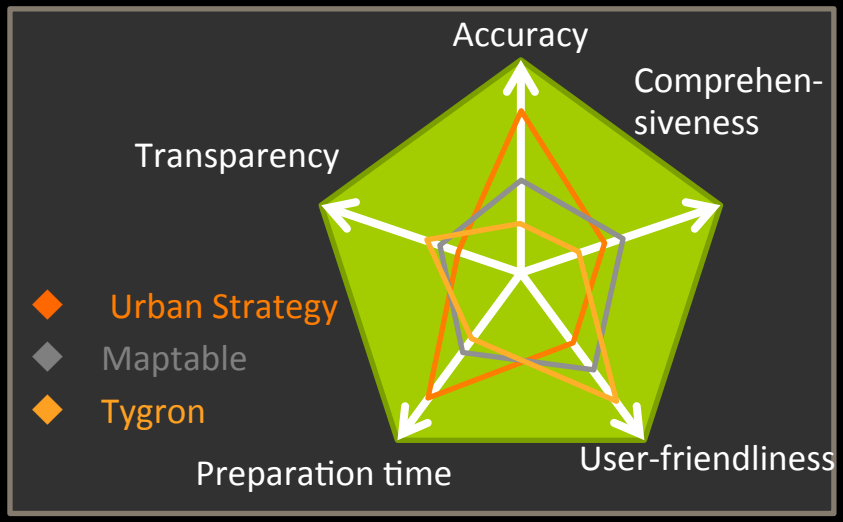
Name tool:	MKP-Maptable	Urban Strategy	Tygron
Developed by:	Ivam, Province of Utrecht, Mapsup	TNO	Tygron
Exists since:	2006	2005	2005
Based on type of software:	ArcGIS + Community Viz Scenario 360 + Phoenix	ArcGIS + connected to various existing models like OPS, Lotos EUROS, Swung, SRM.	ArcGIS online + Tygron game engine
Type of tool:	Computer-based	Both (light web-based version on request)	Web-based
Purposes:	Descriptive; prescriptive; exploration; selection; negotiation	Descriptive; prescriptive; predictive	Descriptive; prescriptive
	Analysis; validation; exploration; design; evaluation; negotiation	Analysis; validation; exploration; design; evaluation	Exploration; evaluation; negotiation
Indicators related to the following themes:	Energy; materials, water; soil, ecology; noise; air; external safety; odour; light; mobility.	Traffic; noise; air quality; external safety; costs; groundwater; liveability; sustainability (energy).	budget; building; water storage; water system; livability; heat stress; green; parking; climate.
Related sources (scientific):	(Arciniegas, 2012; Arciniegas & Janssen, 2009; Arciniegas & Janssen, 2012; Arciniegas et al., 2011; Arciniegas et al., 2013; Pelzer, 2015; Pelzer et al., 2013; Pelzer et al., 2015; Pelzer & Geertman, 2014; Pelzer et al., 2014a; Schatz et al., 2013; Vonk & Ligtenberg, 2010)	(Beurden et al., 2013; Borst, 2010; Dias et al., 2013; Pelzer, 2015; Pelzer & Geertman, 2014; Pelzer et al., 2014b; A Schelling et al., 2010; Te Brömmelstroet, 2014; Te Brömmelstroet et al., 2013)	-
(Popular)	(Mapsup, 2008, 2013, 2015; Mouter & Pelzer, 2013b; Provincie Utrecht, 2015a, 2015b, 2015c; Puylaert & Werksma, 2011, pp. 30-31; Van Helden & De Jong, 2015)	(Mouter & Pelzer, 2013a, 2013b; Ab Schelling et al., 2012; Te Brömmelstroet & Borst, 2012; TNO, 2015a, 2015b)	(Bekebrede et al., 2012; Tygron, 2015)

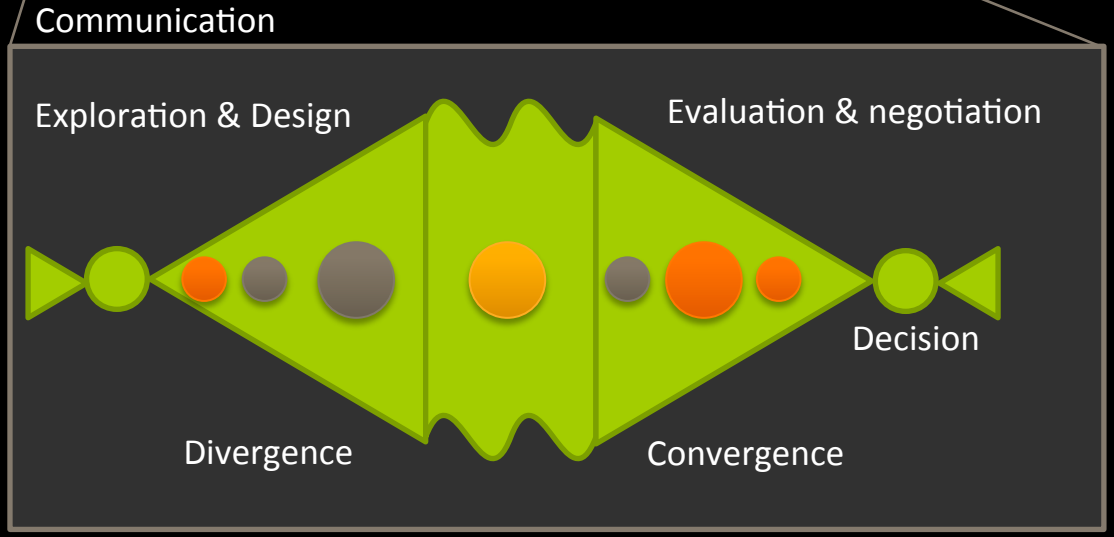
	Case 1	Case 2	Case 3	Case 4
Tool:	Urban Strategy	Urban Strategy	MKP-Maptable	MKP-Maptable
City:	Tilburg	Utrecht	Woudenberg	Maarssenbroek
Project:	SUMP Tilburg	Gezonde Verstedelijking Utrecht	Woudenberg-Oost	Het Kwadrant
Client:	Municipality Tilburg	Rijkswaterstaat o/b/o IenM	Municipality Woudenberg	Municipality Stichtse Vecht
Type of development:	Inner-city	Inner-city	Greenfield	Infill area
Scale (ha):			35 ha	3 ha
Development task:	Development of mobility policy	Development of urban health policy	Development of +- 875 dwellings	Development of 140 dwellings
Funding sources:	Government	Government	Government	Developer Kwadrant B.V. & municipality
Process				
Timeframe:	2015-2040	2014-2030	2014-2015	2014-2015
Phase:	Initiative	Initiative	Initiative	Design
Sequence:	Sequential	Sequential	Integral sequential	Integral sequential
Decision-making culture:	Open	Closed	Open	Closed
Orientation:	Indicative	Indicative	Indicative	Blueprint
Stakeholders:	Municipality Tilburg.	Rijkswaterstaat; Municipality Utrecht; POSAD; KC HUL.	Municipality Woudenberg; Atelier Dutch.	Municipality Stichtse Vecht; Bon Groep B.V.
The application of PSS				
Reason for using the PSS:	External advise: fast & shifting responsibility	Exploration of possibilities	Exploration of possibilities	Convincing the council of feasibility
Aim:	Prescriptive	Prescriptive	Prescriptive	Prescriptive
Workshops:	(1) Evaluation	(1) Evaluation	(1) Evaluation (2) Drawing, simulation	(1) Evaluation (2) Drawing, simulation
Main themes addressed:	Air & noise quality	Air & noise quality	Odour & external safety & noise	Noise quality
Main data sources used:	Municipality	Municipality	Municipality	Municipality
Result:	Ambition plan	Problem description	Programme of requirements	Feasible design

Findings

5. In which cases is the application of PSSs perceived useful by its users and developers? [case studies]

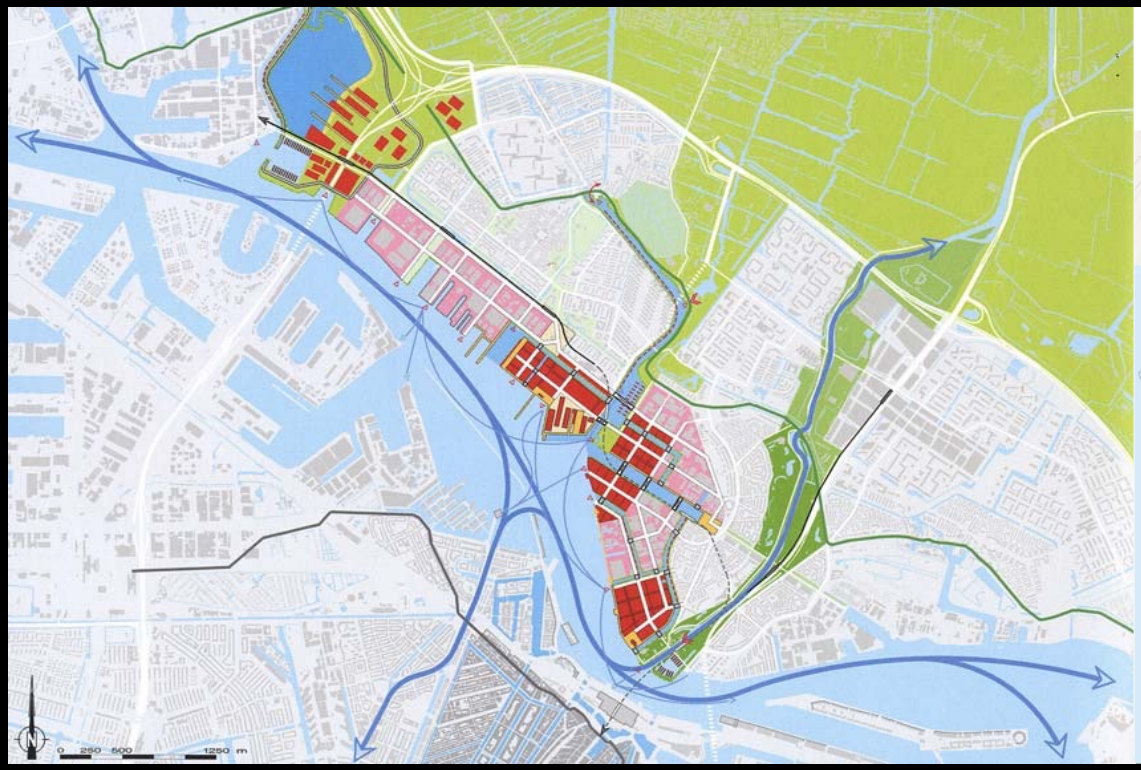






Findings

6. How can the development process in Buiksloterham be characterized? [case study]



Findings

6. How can the development process in Buiksloterham be characterized? [case study]

- Transformation of industrial area into a mixed-use urban area;
- High ambitions regarding to circular economy;
- Contaminated soil en environmental situation makes this hard to achieve;
- Bottom-up initiative: facilitating government: many stakeholders;
- Timeline running from 2005 to 2030: still in its initiative phase;
- Improving economic situation creates pressure of major parties to develop in the area.

Findings

7. How can PSSs improve the development process in Buiksloterham?

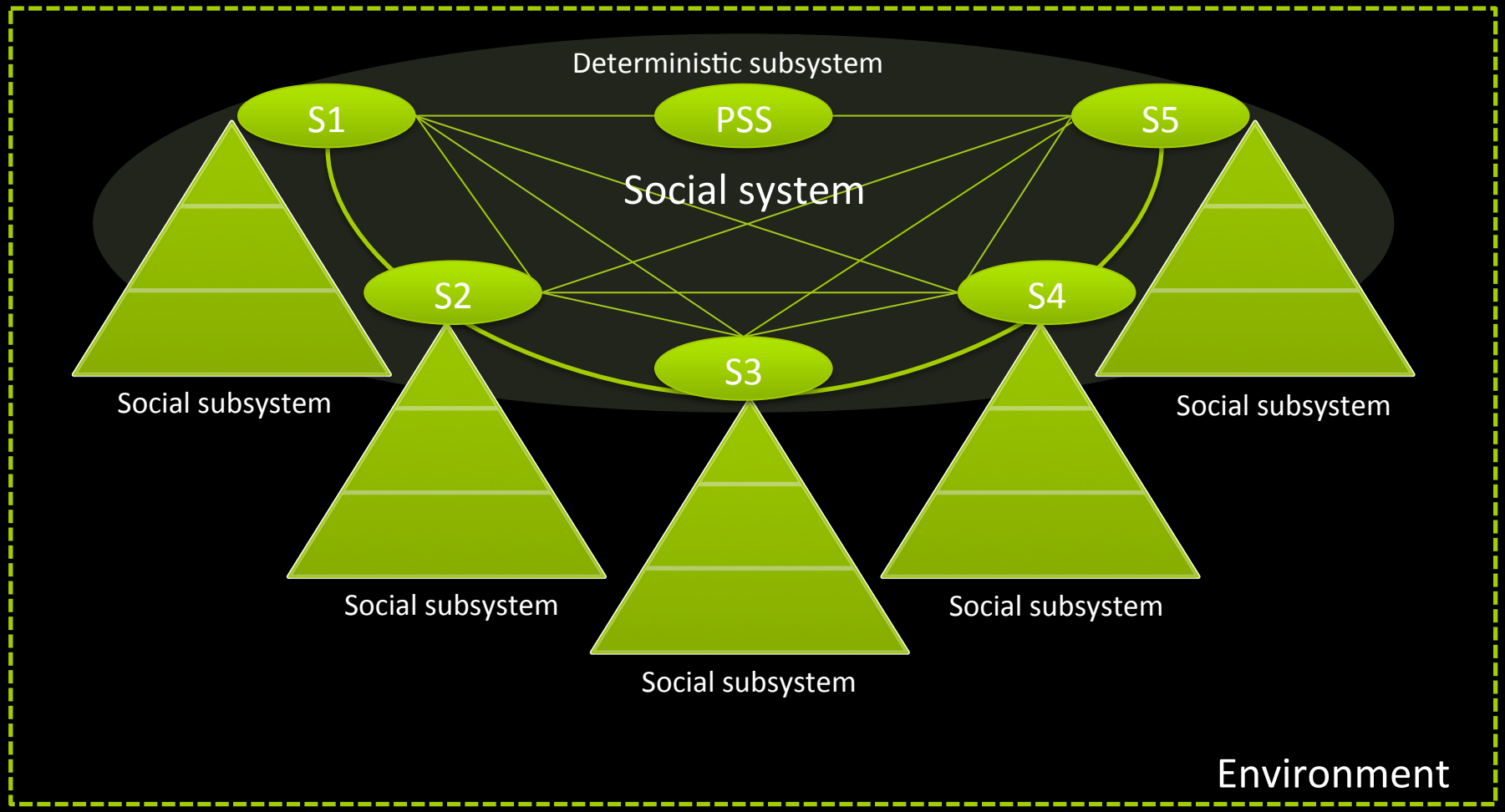
- Hard vs. soft systems approach
- Group objectives vs. Individual objectives
- Open decision making vs. Closed decision making
- Moment in the process
- Explicit vs. Tacit knowledge

- Optimization vs. Satisfaction
- Building according to specifications vs. Fitness for purpose

Findings

7. How can PSSs improve the development process in Buiksloterham?

- Hard vs. soft systems approach



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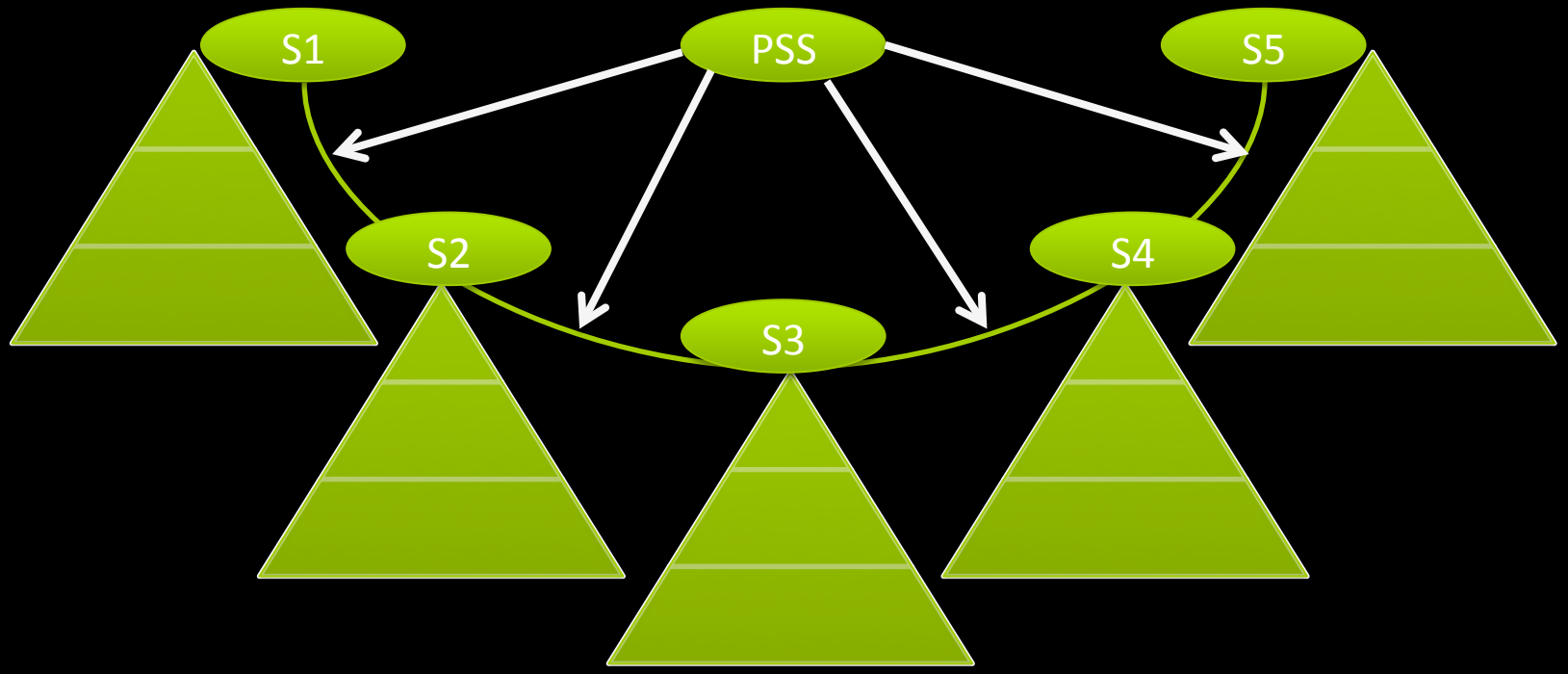

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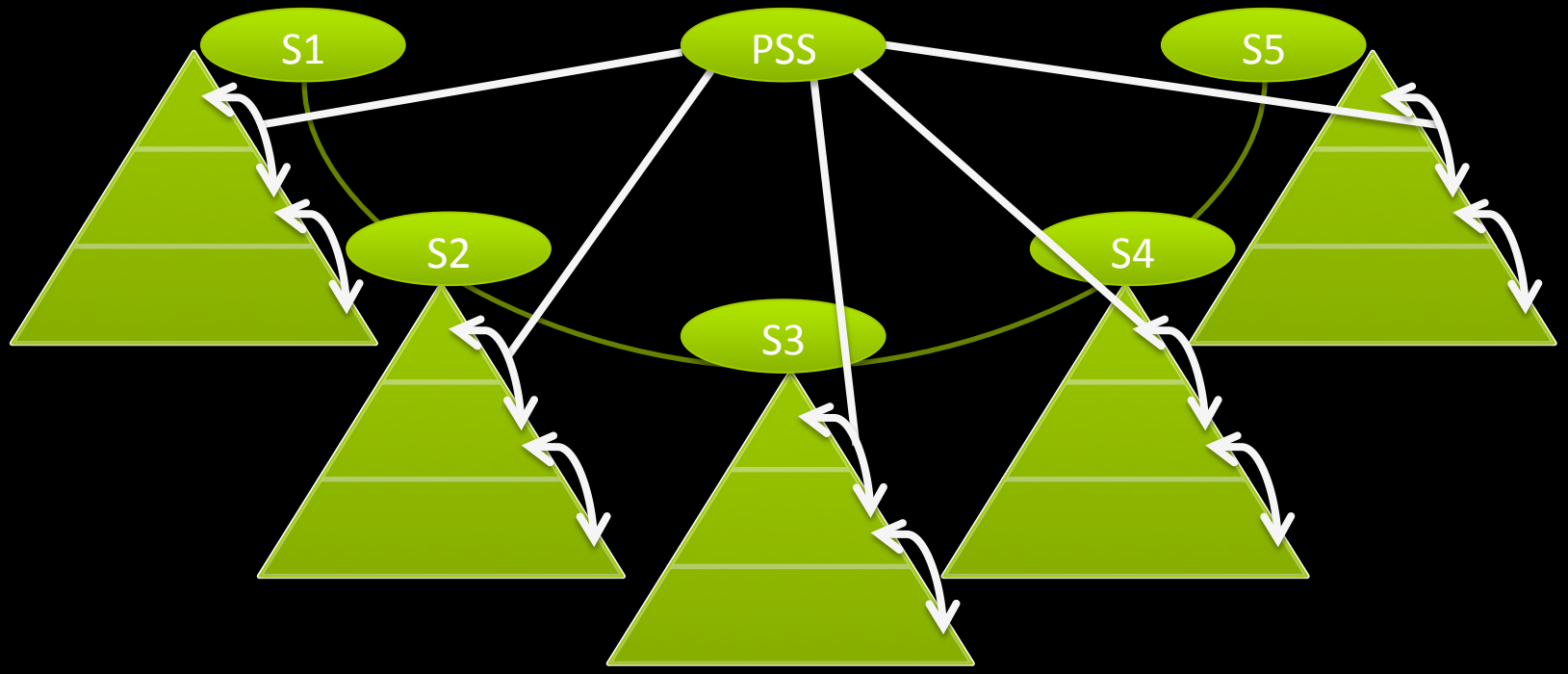

Findings

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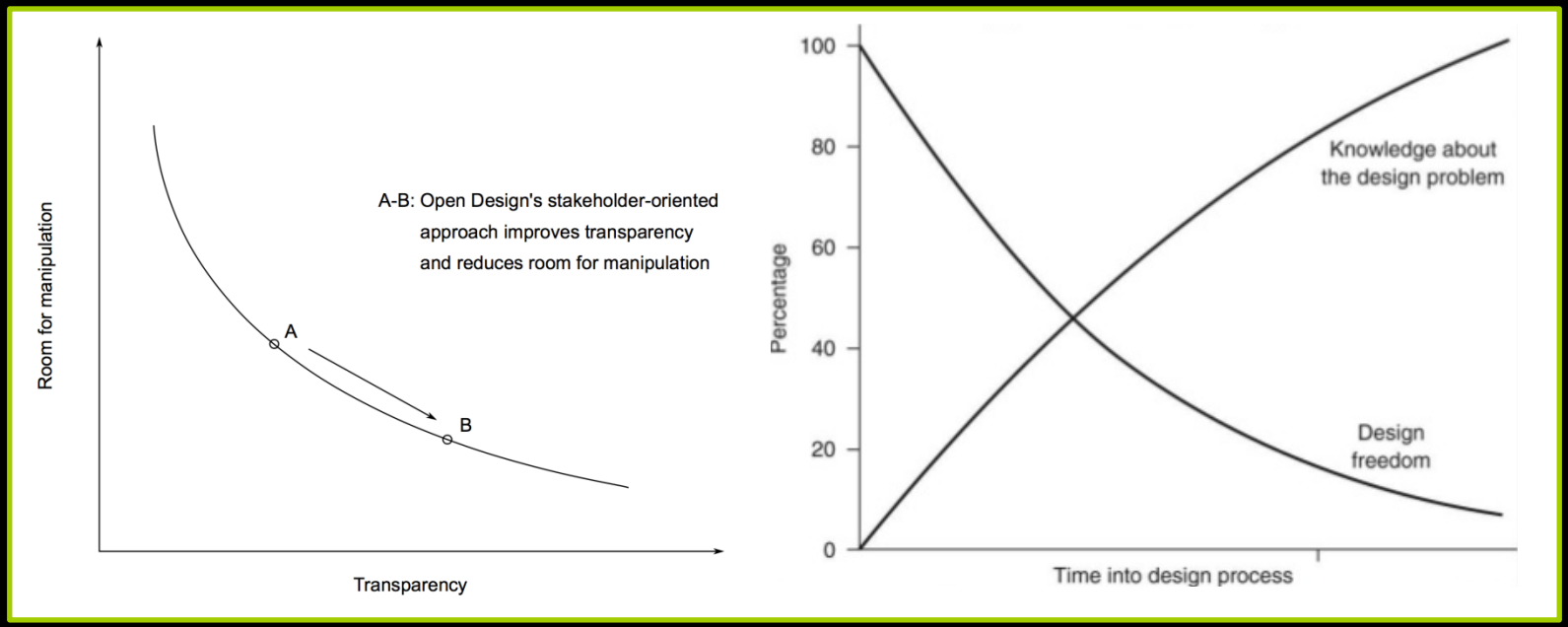
- Open decision making vs. Closed decision making
- Moment in the process



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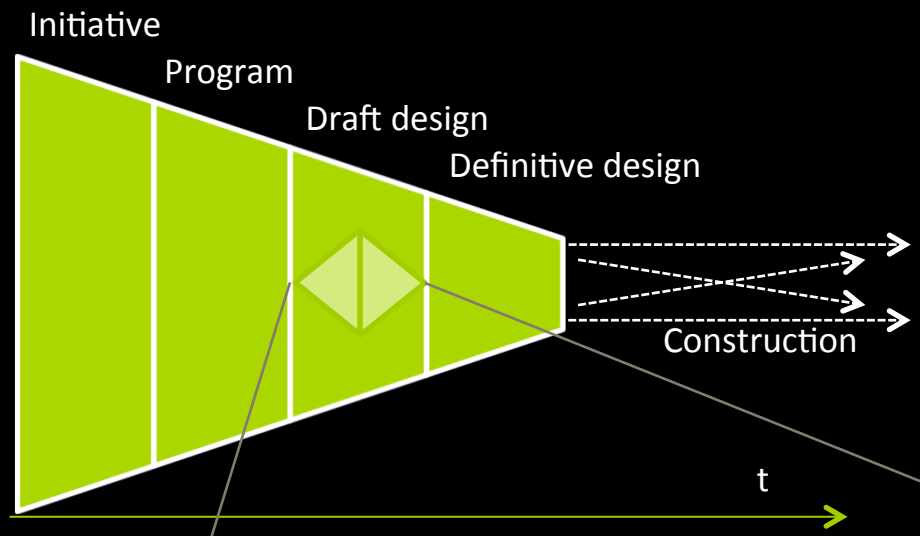

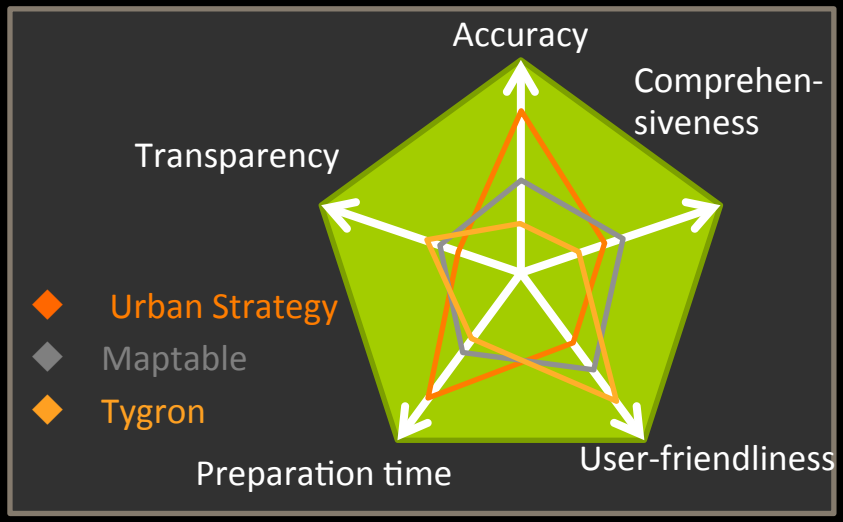

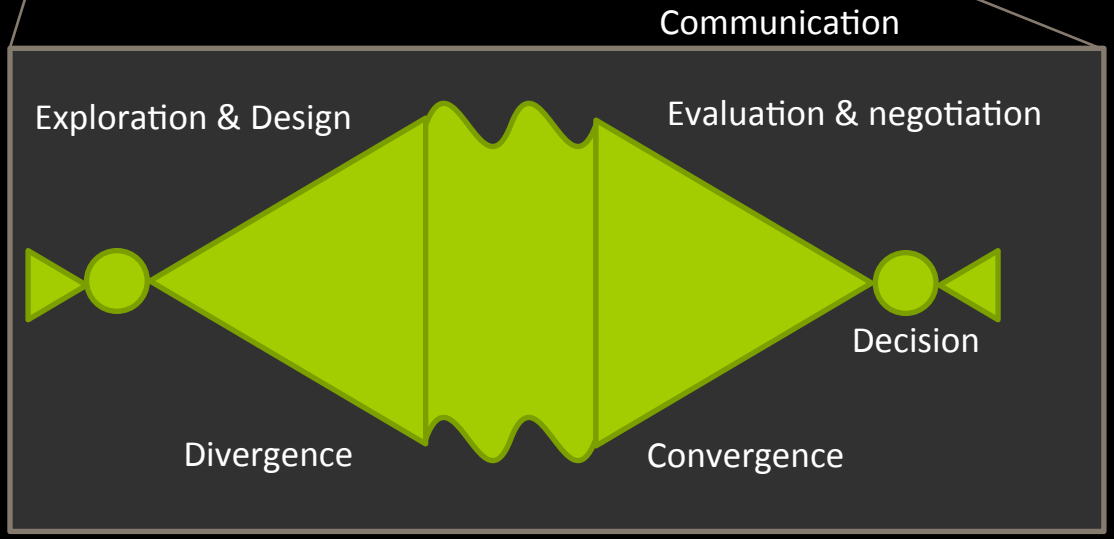

Findings

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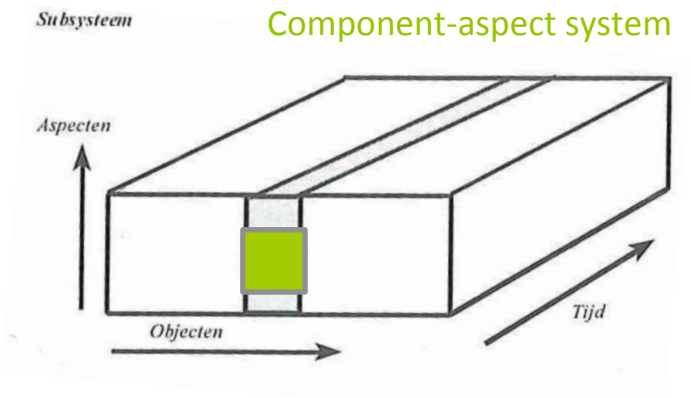
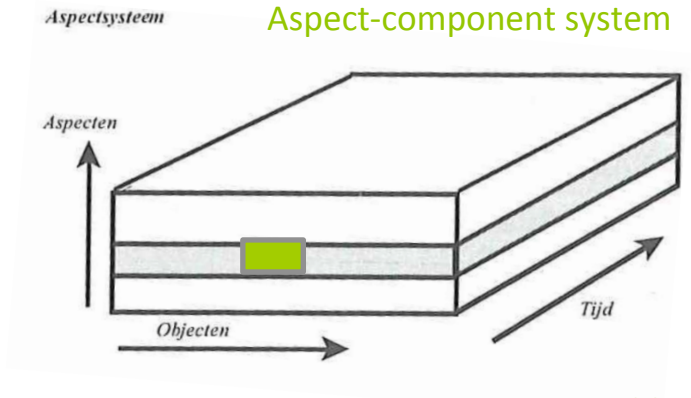
- Explicit vs. Tacit knowledge

Component-aspect system



Urban Strategy

Aspect-component system



MKP-Maptable

Findings

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Findings

7. How can PSSs improve the development process in Buiksloterham?

In structuring the ambitious redeveloping process. Many stakeholders with vary different backgrounds are involved, from citizens with limited knowledge about redevelopment processes to developers and planners.

It's very important to share tacit and explicit knowledge to create societal support for the redevelopment plans.

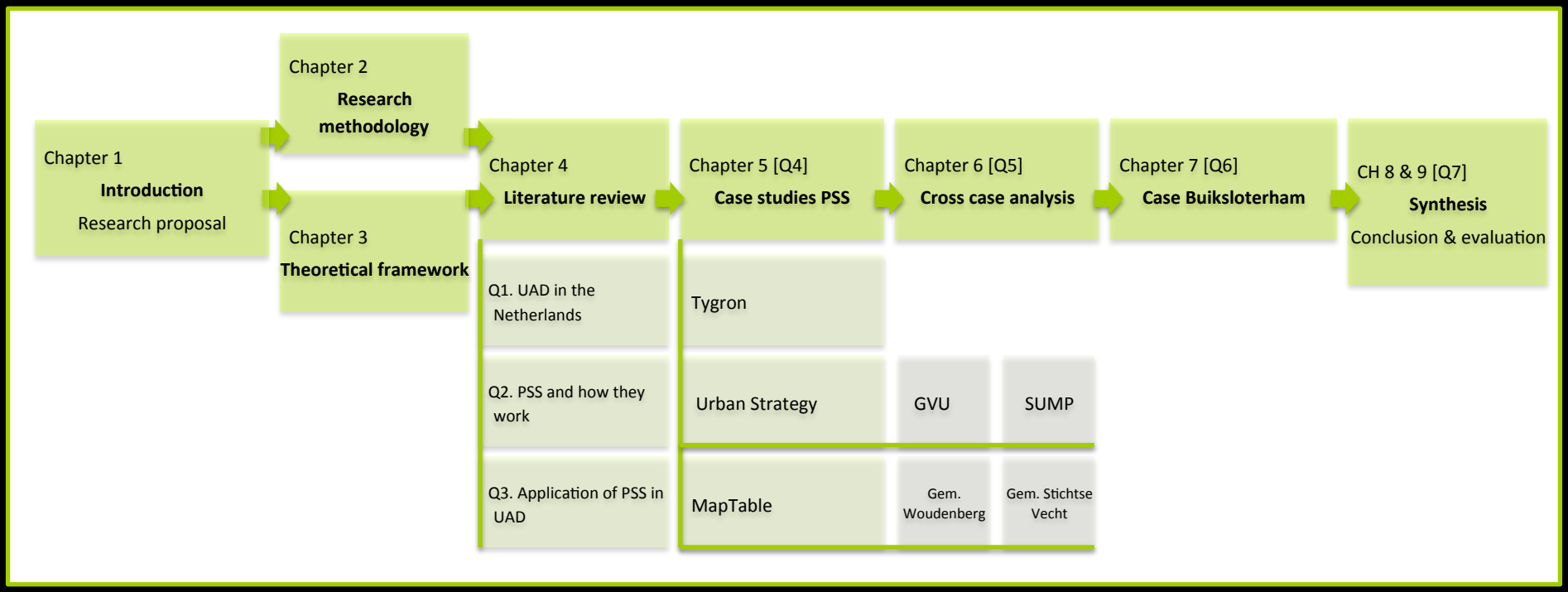
"Brainpower should be mobilized: the technique is in place, but the way of organizing and funding the development should be devised."

Conclusion

How could PSSs improve the decision-making process in the urban area redevelopment process of Buiksloterham, Amsterdam Noord?

1. What are characteristics of the decision-making process in urban area development in the Netherlands?
2. What are PSSs and how do they work?
3. How are PSSs applied in urban area development?
4. What is the role of PSSs in urban area development projects in the Netherlands in relation to the cases of Urban Strategy and the MKP-Maptable?
5. In which cases is the application of PSS perceived useful by its users and developers?
6. How can the development process in Buiksloterham be characterized?
7. How can PSSs improve the development process in Buiksloterham?

Reflection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Q2. PSS and how they work
Q3. Application of PSS in UAD
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Conclusion & evaluation