Planning support systems in urban development in the Netherlands

Marije Schilder 4003071
Q1. The characteristics of urban development in the Netherlands

Q2. PSS and how they work
   - Literature review

Q3. How PSS are applied in urban development
   - Literature review

Q4. The role of PSS in urban development projects in the Netherlands
   - Urban Strategy
   - MapTable
   - Tygron / Planmaat

Q5. Cases in which PSS are successfully applied
   - Cross-case analysis

Q6. The characteristics of the urban development process in Buiksloterham
   - Secondary data analysis
   - Semi-structured interviews
   - Observation of gaming session

Q7. How PSS can improve the urban development process in Buiksloterham

Conclusion
Evaluation
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
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

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[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]
## 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]

<table>
<thead>
<tr>
<th>MapTable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kwadrant in Maarssenbroek</td>
</tr>
<tr>
<td>Woudenberg Oost</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>STRENGTHS</th>
<th>WEAKNESSES</th>
</tr>
</thead>
<tbody>
<tr>
<td>User-friendliness: interactive setting;</td>
<td>Calculation speed;</td>
</tr>
<tr>
<td>Design possibilities;</td>
<td>Compactness: size &amp; weight;</td>
</tr>
<tr>
<td>Tool draws positive attention.</td>
<td>Preparation time.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OPPORTUNITIES</th>
<th>THREATS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flexibility;</td>
<td>Risk of technical failure;</td>
</tr>
<tr>
<td>Streamlining different programs and data sources;</td>
<td>Power relations: fear for decreased negotiation position;</td>
</tr>
<tr>
<td>Portability: lighter and thinner;</td>
<td>Transition of different stakeholders.</td>
</tr>
<tr>
<td>Greater role citizen participation.</td>
<td></td>
</tr>
</tbody>
</table>
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

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

<table>
<thead>
<tr>
<th>Name tool:</th>
<th>MKP-Maptable</th>
<th>Urban Strategy</th>
<th>Tygron</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developed by:</td>
<td>Ivam, Province of Utrecht, Mapsup</td>
<td>TNO</td>
<td>Tygron</td>
</tr>
<tr>
<td>Exists since:</td>
<td>2006</td>
<td>2005</td>
<td>2005</td>
</tr>
<tr>
<td>Based on type of software:</td>
<td>ArcGIS + Community Viz Scenario 360 + Phoenix</td>
<td>ArcGIS + connected to various existing models like OPS, Lotos EUROS, Swung, SRM.</td>
<td>ArcGIS online + Tygron game engine</td>
</tr>
<tr>
<td>Type of tool:</td>
<td>Computer-based</td>
<td>Both (light web-based version on request)</td>
<td>Web-based</td>
</tr>
<tr>
<td>Purposes:</td>
<td>Descriptive; prescriptive; exploration; selection; negotiation</td>
<td>Descriptive; prescriptive; predictive</td>
<td>Descriptive; prescriptive</td>
</tr>
<tr>
<td>Analysis; validation; exploration; design; evaluation; negotiation</td>
<td>Analysis; validation; exploration; design; evaluation</td>
<td>Exploration; evaluation; negotiation</td>
<td></td>
</tr>
<tr>
<td>Indicators related to the following themes:</td>
<td>Energy; materials, water; soil; ecology; noise; air; external safety; odour; light; mobility.</td>
<td>Traffic; noise; air quality; external safety; costs; groundwater; liveability; sustainability (energy).</td>
<td>budget; building; water storage; water system; livability; heat stress; green; parking; climate.</td>
</tr>
<tr>
<td>Related sources (scientific):</td>
<td>(Arciniegas, 2012; Arciniegas &amp; Janssen, 2009; Arciniegas &amp; Janssen, 2012; Arciniegas et al., 2011; Arciniegas et al., 2013; Pelzer, 2015; Pelzer et al., 2013; Pelzer et al., 2015; Pelzer &amp; Geertman, 2014; Pelzer et al., 2014a; Schatz et al., 2013; Vonk &amp; Ligtenberg, 2010)</td>
<td>(Beurden et al., 2013; Borst, 2010; Dias et al., 2013; Pelzer, 2015; Pelzer &amp; Geertman, 2014; Pelzer et al., 2014b; A Schelling et al., 2010; Te Brömmelstroet, 2014; Te Brömmelstroet et al., 2013)</td>
<td>-</td>
</tr>
<tr>
<td>------</td>
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</tr>
<tr>
<td>City:</td>
<td>Tilburg</td>
<td>Utrecht</td>
<td>Woudenberg</td>
</tr>
<tr>
<td>Project:</td>
<td>SUMP Tilburg</td>
<td>Gezonde Verstedelijkings Utrecht</td>
<td>Woudenberg-Oost</td>
</tr>
<tr>
<td>Client:</td>
<td>Municipality Tilburg</td>
<td>Rijkswaterstaat o/b/o lenM</td>
<td>Municipality Woudenberg</td>
</tr>
<tr>
<td>Type of development:</td>
<td>Inner-city</td>
<td>Inner-city</td>
<td>Greenfield</td>
</tr>
<tr>
<td>Scale (ha):</td>
<td>35 ha</td>
<td>3 ha</td>
<td></td>
</tr>
<tr>
<td>Development task:</td>
<td>Development of mobility policy</td>
<td>Development of urban health policy</td>
<td>Development of 875 dwellings</td>
</tr>
<tr>
<td>Funding sources:</td>
<td>Government</td>
<td>Government</td>
<td>Government</td>
</tr>
</tbody>
</table>

**Process**

| 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]
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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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?

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7. How can PSSs improve the development process in Buiksloterham?
**Chapter 1**
Introduction
Research proposal

**Chapter 2**
Research methodology

**Chapter 3**
Theoretical framework

**Chapter 4**
Literature review

**Chapter 5 [Q4]**
Case studies PSS

**Chapter 6 [Q5]**
Cross case analysis

**Chapter 7 [Q6]**
Case Buiksloterham

**CH 8 & 9 [Q7]**
Synthesis
Conclusion & evaluation

Q1. UAD in the Netherlands

Q2. PSS and how they work

Q3. Application of PSS in UAD

Tygron

Urban Strategy

GVU

SUMP

MapTable

Gem. Woudenberg

Gem. Stichtse Vecht