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Making planning support systems matter : improving the use of planning support systems for integrated land use and transport strategy-making

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Publication date

2010

[Link to publication](#)

Citation for published version (APA):

te Brömmelstroet, M. (2010). *Making planning support systems matter : improving the use of planning support systems for integrated land use and transport strategy-making*. [Thesis, fully internal, Universiteit van Amsterdam].

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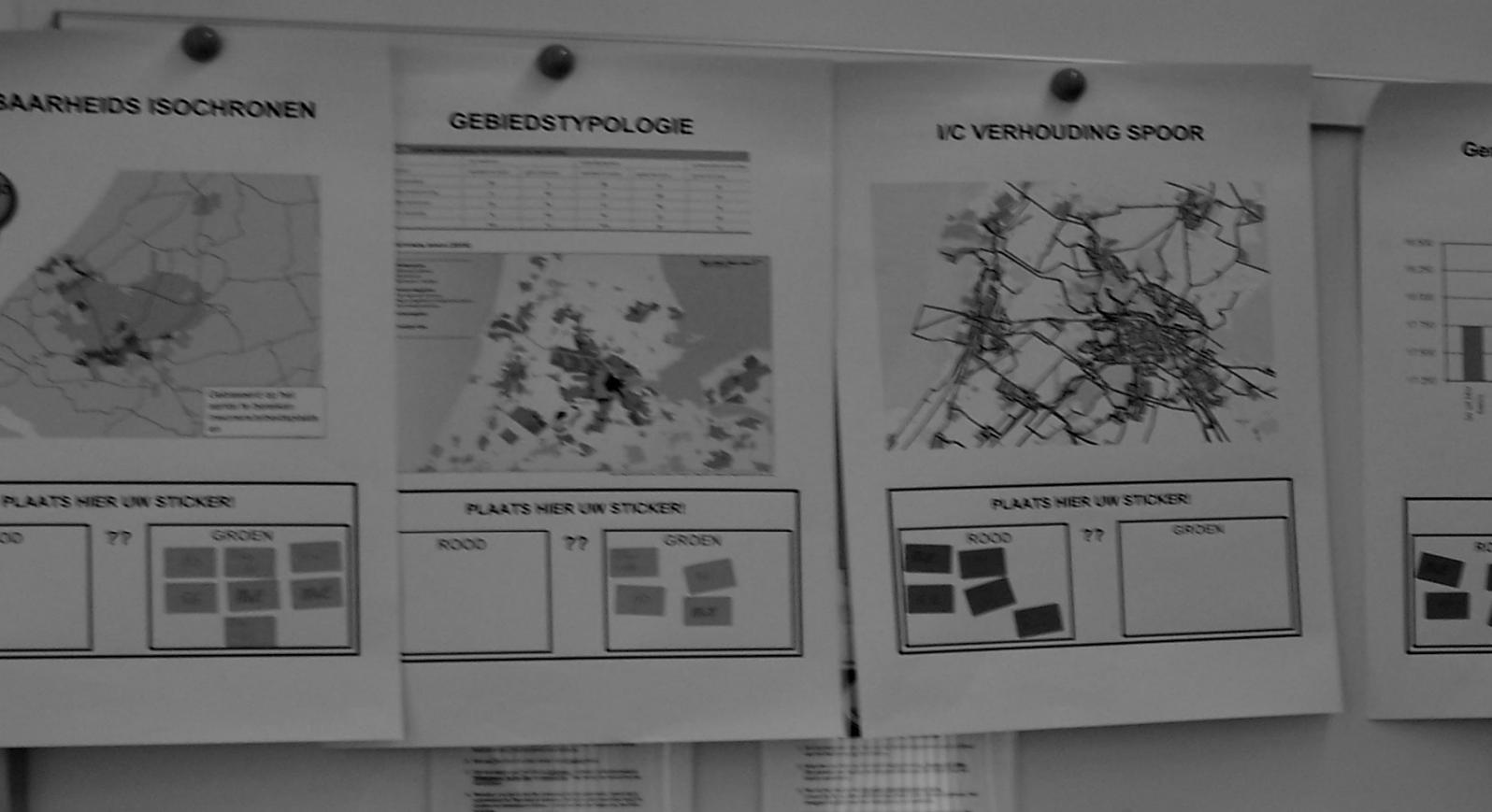
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Chapter 7

General Conclusions and Recommendations



The main conclusions identified throughout the dissertation, will be highlighted and summarised in this chapter. This will answer the central research question (as presented in Chapter 1) and offer fruitful directions for future research.

7.1 CONCLUSIONS

My argument is based on the discussions in academia and in planning practice about (1) the importance of integrated land use and transport strategy-making for the future sustainability of urban regions and (2) the difficulties of implementing academically and commercially developed knowledge to support integrated land use and transport strategy-making in daily planning practice. From these two main points, the main question of this dissertation was formulated as

How to improve the use of Planning Support Systems that aim to support integrated land use and transport strategy-making?

The current Planning Support Systems (PSS) that are used to support integrated land use and transport (LUT) planning seem well suited for some planning tasks, such as calculating the effects of new/existing strategies and providing background information for discussions. However, these PSS also have serious shortcomings; they do not provide new LUT insights, for example they: are used to justify positions that are already taken (i.e. 'fact-fighting'), do not fit the planning process and are not well linked to planning practice. Land use respondents are more critical of these shortcomings than their transport counterparts. Moreover, the output is often too transport oriented and fails to provide a common LUT language to support the generation of strategies. Chapter Two highlighted the LUT strategy generating stage (where land use and transport planners need the most support) as the weakest link, which was attributed to: a lack of transparency, low communication value, lack of user friendliness and the impossibility to experiment with the PSS. PSS should function as laboratories where planners can collectively experiment and take part in group learning about LUT relationships, which will allow them to subsequently generate grounded and tested LUT strategies. In order to provide this support, the PSS should be easy 'to play with' and transparent regarding its assumptions. One promising strategy that was formulated in Chapter Two is to create a structural dialogue between PSS developers and potential users. This should use existing planning problems from daily planning practice and would correspondingly produce a 'learning by doing' dynamic. Around the planning problem, the PSS users and developers can cooperatively develop and use a PSS, iteratively conceptualising and testing it in iterative cycles.

Chapter Three continued with insights and lessons from the academic fields of knowledge management (the SECI model) and cognitive psychology (Kolb's learning styles), and highlighted the methods and techniques that could address some of these problems. Based on these methods and techniques, the Mediated Planning Support (MPS) approach was presented as a potential answer to these challenges. The MPS approach focuses on situations where existing tools, instruments or PSS need to be further modified in order to be useful for planners. The MPS approach addresses some of the fundamental bottlenecks recognised in the PSS literature. The

transparency of the output and the assumptions of the (computer) models are improved through discussions and continuous explanations by the modellers. The PSS become more flexible and attuned to the particular characteristics of specific planning process, thus increasing their compatibility with existing planning tasks. Also, the planning participants can gain a shared ownership of the process and improved information choices. PSS developers can learn how their model and output is used in 'wicked' planning processes and how this unpredictability can influence the usefulness of their products.

The initial application of the MPS approach was discussed in Chapter Four. This application in the Greater Region of Amsterdam resulted in two outcomes: (1) the development of a PSS to support integrated land use and transport strategy-making and (2) shared strategies. For the PSS, several crucial characteristics were identified:

- The generation of alternatives seems best supported by geographical mappings of the current situation;
- Simplicity is key;
- Network maps showing the functioning of important transport links are important for understanding the impacts of the generated alternatives;
- Most of the additional information should be provided in the form of a background database (i.e. on a laptop) that can be consulted during discussions;
- In the final stage (selecting robust choices and identifying interdependencies) graphs are helpful for indicating the impact of certain interventions.

For the participants, the developed strategies were not the most important result of the MPS approach. Instead, an increased (and perhaps most importantly a shared) awareness of the rationale behind LUT relations and choices was identified as the main added value. Or even, as one transport planner asserted, "it created insight that existing ideas are not the only ones that make sense". The participants also noted that the process perfected existing ideas and concepts, enriched their evidence-base and created a common language for addressing these issues.

Chapter Five set out to explore the functioning of the mechanisms behind the intervention (knowledge generation) and its outcomes (shared LUT insights). These mechanisms have been explored in the specific context of land use and transport planners participating in strategy-making processes at the local/regional scale in the Netherlands. Based on literature review (especially the SECI model of Nonaka and Takeuchi [1995]) and the observations, questionnaires and interviews of two explorative cases, it was concluded that:

- Socialisation is an important process that creates shared LUT knowledge;
- For socialisation to be constructive, both externalisation and internalisation are crucial processes;
- The cases emphasised that both the planning problem and the supporting information (content of the PSS) have to be discussed and selected in open dialogue between planners and PSS developers;

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- The cases also indicated that PSS developers (modellers) need to be present throughout the process (from problem definition to strategy selection), in order to support externalisation and internalisation;
 - In order to be successful, MPS processes should be set up as an environment in which planners can *learn* about important LUT relationships.

The case analysis of the sixth chapter suggests that the MPS intervention in this specific context did yield significant positive results: improving the compatibility of PSS to the characteristics of strategy-making processes, increasing the planning practitioners' awareness and understanding of the PSS, enhancing transparency of its assumptions and outcome and increasing acceptance and use. The expected increase of the PSS' usefulness in supporting strategy-making could not be fully verified in quantitative terms, although participatory observation and workshop questionnaires did support this finding. The mechanism that produced these outcomes consists of several elements. First, the open attitude of both parties is important and should be fostered and guided throughout the process by a mediator/facilitator. This serves to preserve an open collaborative spirit and prevent a relapse into a destructive adversarial attitude. Second, the prototyping process is vital for structuring the dialogue, i.e. for specifying the planners' demands and communicating the (im)possibilities of the PSS. The result is increased commitment, understanding and acceptance. Third, this prototyping process should emphasise the both the externalisation of tacit knowledge and especially the internalisation of explicit knowledge.

Overall, the research explored the implementation gap of PSS for integrated land use and transport strategy-making in detail. The proposed solutions focussed on the social side – instead of on the technical side – of the implementation bottlenecks. This was *grounded* in academic insights from knowledge management and cognitive sciences and *tested* in three cases of strategy-making in the Netherlands.

The main conclusion is that linking different types of knowledge (tacit and explicit) in a structured and iterative way improves the PSS use. It improves not only the quality and context specificity of the PSS, but also increases mutual awareness of (1) what a PSS can and cannot deliver and (2) the characteristics of strategy-making processes. Finally, the transparency and flexibility of the PSS are improved. Such an approach is situational: it has to be repeated – with varied detail – in each new planning situation. Thus, it is a continuous prototyping process in which the PSS developer and other participants gather new knowledge about strategy-making characteristics that influence the use of their instrument. Such a MPS approach is especially suitable for improving existing tools and instruments, which are often not utilised to their full potential for providing support to strategy-making (notably transportation models).

7.2 FUTURE RESEARCH DIRECTIONS

This research followed a strong pragmatic approach, which was focused on planning practice. This improved the understanding of (1) certain academically grounded interventions aimed at improving the usability of PSS and (2) how these (do not) work in the complexity of planning practice and why. This pragmatic research

approach enables an improved understanding of the complexity of real-life strategy-making situation and thus increases the relevance of the findings for practical situations. However, unlike classic experiments, there is only limited control over the variables, for example differentiation in variables between cases but even this control is questionable. In reality, numerous context variables influenced the success and failure of parts of the intervention. This limits the generalisability and the identification of universal patterns.

Future research should first focus on testing these findings in research environments with a weaker context but with more control (arrow [1] in Figure 7.1), i.e. more formal experiments. For example, they could test if and how the usability of PSS improves with increasing transparency or flexibility. But also the main assumptions about the *conceptual use* of PSS and its outcomes can be tested: how much does improved insight really matter in strategy-making?

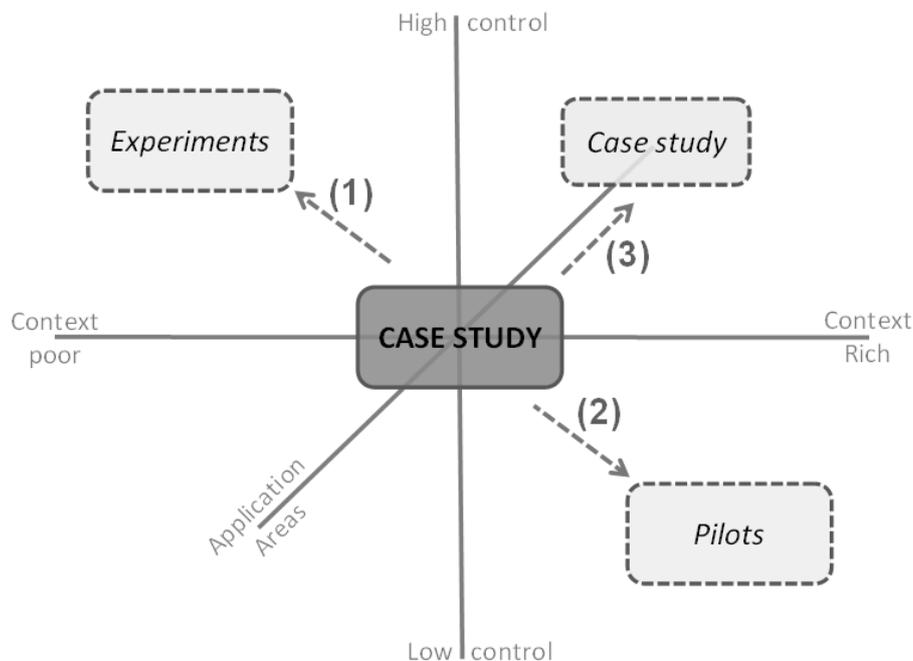


Figure 7.1 Towards research models with more control, more context and different domains

A second important direction for future research takes the opposite approach. Consultants would apply the MPS approach in more real-life strategy-making contexts (arrow [2] in Figure 7.1), while the researchers would observe and record the outcomes. It would sharpen insights on the workings of the mechanisms discussed in this dissertation, in the context of land use and transport strategy-making.

A third and final direction for research consists in extending the context in which the MPS framework is applied (arrow [3] in Figure 7.1), not only in other spatial planning sectors (such as environment, economy or water) but also in strategy-making situations with more conflicting interests and with more diverse sets of actors (stakeholders, citizens and decision-makers).

A last direction, more focused on pure research and methodology, would be to analyse whether there is a possible synergy between the pragmatic research approach (aiming for relevance above rigor) and the syntactic research approach (aiming for rigor above relevance). Is it possible to conduct research that can balance relevance and rigor or does the researcher have to choose one over the other?

