

Public summary of PhD-thesis of Cahyono Susetyo

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Stakeholders-Oriented Spatial Decision Support System

The most common method to increase stakeholders' involvement in participatory planning and decision-making practices is by improving the communication between planners and stakeholders. Therefore, participatory planning practices mainly focuses on expanding the capabilities of experts and planners to gather and analyse stakeholders' preferences as one of the considerations in planning and decision-making. To provide an alternative approach that can overcome the drawbacks of a planner-centered participatory planning such as the limited number of stakeholders who can be involved, this research focused on improving stakeholders' participation by negotiation. Here, decision-making processes mainly focuses on communication among stakeholders and their interactions to reach an agreement.

The main objective of this research was to develop a computer-based method that supports stakeholders' negotiation in a participatory planning and decision-making process. To achieve this objective, a computer system was developed where stakeholders could make and adjust their proposals toward negotiation issues. The computer system acts as a human mediator that gathers stakeholders' preferences and give suggestions to help stakeholders improve their proposals.

To improve participatory planning, I focussed on spatial aspects. A land allocation problem was selected as the decision problem, which should be solved by stakeholders with the mediation of a computer system. The computer-mediated negotiation solves the decision problem by moving stakeholders' proposals closer until an agreement is reached or the system cannot produce suggestions that can move stakeholders' proposals closer one to another.

To test the developed computer system, I constructed a negotiation setting: a land allocation problem in Surabaya City, Indonesia. Using hypothetical data, I found that my model was capable of solving a multi-issue, multi-stakeholder negotiation problem. Knowing this, I continued with real stakeholders, and expanded the amount of stakeholders. I tested automated negotiation, where the negotiation model automatically seeks an optimum solution between a large number of participants. Then I asked the stakeholders to use the computer system to adjust their proposals until an agreement or the optimum solution was reached. I found that the system can cope with a large number of stakeholders and that they can reach an agreement with the support of a computer-based negotiation support system.

In my approach of computer-mediated negotiation setting, the role of experts and planners is not to solve the decision problems anymore, but rather preparing a platform where stakeholders can interact to one another during negotiation. However, this does not mean that their role is reduced. Their expertise is still required to provide information about various aspects in the process of planning and decision-making.

Title of PhD-thesis: Stakeholders-Oriented Spatial Decision Support System.



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