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## **PLANNING SUPPORT SYSTEMS FOR PARTICIPATORY PLANNING**

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### **1. COMPUTER-USAGE IN PLANNING**

While many planners use computers, they use them primarily for general-purpose office functions. An assessment of planning practice at the beginning of the twenty-first century suggests, that the adoption and use of geotechnology tools (geographic information and spatial modeling systems) is far from widespread and far from being effectively integrated into the planning process (Stillwell et al. 1999). Planners and designers remain, at best distrustful, or at worst downright antagonistic toward highly systematic and computer-based models (Harris 1989). From the assessment it may be concluded that many planners now have access to the geodata and meta-geoinformation facilities of their organizations, and many are proficient in using their GIS tools to perform spatial queries and to generate thematic maps (Geertman and Stillwell 2003b). Sadly, however, progress towards the use of GIS beyond these basic activities to help solve key planning problems through more sophisticated analysis, has been very limited (Geertman, 1999). They are little used for those tasks that are unique to planning, such as forecasting, analysis, sketching, and evaluation (Klosterman 2001). Alleged reasons for little usage of computers for the tasks unique to planning are that most of current tools that do exist are far too generic, too complex, too inflexible, incompatible with most planning tasks, oriented towards technology rather than problems and too focused on strict rationality (Geertman and Stillwell 2003b).

### **2. PLANNING SUPPORT SYSTEMS (PSS)**

Quite recently, a new generation of tools has entered the scene that is focusing directly to support planning tasks in particular, so-called Planning Support Systems. Planning Support Systems (PSS) were defined by Harris (1989) as an appropriate model for combining a range of computer-based methods and models into an integrated system that can support the planning function. They bring together the functionalities of GIS, models and visualization, to gather, structure, analyze and communicate information in planning. Or, as recently broadly defined by Geertman and Stillwell (2003a), PSS are a subset of geotechnology-related instruments that incorporate a suite of components (theories, data, information, knowledge, methods, tools, et cetera) that collectively support all of or some part of a unique planning task. They take the form of information frameworks that integrate the full range of information technologies useful for supporting the specific planning context for which they are designed (Geertman and Stillwell 2003b). Inevitably PSS are closely related to two other more well-known systems, GIS and SDSS, and therefore it is important to clarify what makes each of these distinctive. GIS can be broadly regarded as general-purpose systems, comprising tools for the handling of geo-referenced data, and applicable for a wide diversity of tasks and problems in various settings. Typically GIS provide generic solutions whereas PSS are specific and focused on the tasks of the application. This implies

the handling of aspatial and nonspatial data as well as spatial data; historical data sets as well as projections; qualitative information as well as quantitative; implicit and semi- or even ill-structured knowledge as well as explicit and well-structured knowledge; and the modeling, design and analysis of dynamic spatial data and information as well as the management and presentation of static spatial data or information. This shows that GIS will form a part of a PSS, but that more is needed to support planning tasks in an appropriate way. SDSS have much in common with PSS. The main difference between the two tool-types is that PSS will have to pay particular attention to long-range problems and strategic issues and may be designed explicitly to facilitate group interaction and discussion, while SDSS are generally designed to support shorter term policy-making by isolated individuals and by business organizations (Clarke 1990). Furthermore SDSS are intended primarily to support executive decision-making (Geertman and Stillwell 2003b).

### **3. UNDER-USAGE OF PLANNING SUPPORT SYSTEMS**

Although optimists believe that PSS have the potential to improve spatial planning substantially, up till now their use in planning practice is limited. A reason for this can be the fact the most planners still are unaware of the existence and potential functionality of these PSS. Over the last few years, individuals or groups, based at scientific, research, or planning institutions around the world, have been involved in development, testing and implementation of a range of PSS. However, no comprehensive picture of the extent of these developments has been constructed and no assessment of the success of their adoption has been undertaken. As a result, different groups of researchers and developers themselves may well be undertaking a substantial amount of work that duplicates or overlaps with work undertaken elsewhere. At the same time, the planning community as a whole has little idea of where to look in the academic or planning literature for good examples of practical applications of PSS. This is problematic for the potential consumers (planners) at a time when there is an increasing need for geotechnology support. Recently, two books edited by Brail and Klosterman (2001) and Geertman and Stillwell (2003b) on planning support systems in practice were published that contribute to the realization of the comprehensive picture of the extent of the developments in PSS.

Another reason for the fact that use of PSS in practice has remained limited up till now can be that known PSS are not appropriate enough to support these planning practices in a dedicated way. And another more general reason can be that support tools are too much focused on technology instead of on the actual planning process itself and the ways in which it can be supported. PSS are often developed from a rather rational view of planning, while in Europe and the USA participation in planning is increasing at a tremendous pace. Participatory planning is seen as means to deal with complexity originating from demands of firms, citizens, interest groups and other governments to have their interests involved in planning and to be physically involved in planning. Support of participatory planning requires PSS to be able to deal with issues originating from the diversity of participants involved; the increased interaction between the participants and between the participants and the supporting instruments; and the characteristics of the planning method, planning process and policy context. Instruments that are developed to support the planning process need to take these factors or pre-requisites into consideration (Geertman and Stillwell 2003b). Many existing PSS are suitable to be applied by a single user, sitting at his desk to analyze some kind of planning problem, based on his own interpretation of the problem. These PSS therefore seem to be less appropriate to support a participatory planning process, which may be a reason for under-usage of PSS for participatory planning.

#### 4. PROBLEM, AIM AND FOCUS OF THE RESEARCH PROJECT

This research project focuses on increasing the fit of PSS to the job goals and requirements of participatory planning instead of on purely improving their technical abilities. It is focused on the improvement of a special strand of PSS, dedicated for so-called participatory planning. The problem on which the research project is based is that there's little insight into how these Planning Support Systems could be developed and applied to improve participatory spatial planning in particular at a regional governance level. The research project aims at improving the quality of Planning Support Systems by finding out how they could be dedicated so as to support participatory spatial planning situations. However, before developing and applying PSS for participatory planning much more insight is needed in the underlying reasons for the under-usage of PSS in practice. After all, if it appears that other reasons than lack of fit to the participatory planning tasks are blocking wide acceptance and usage of PSS following efforts will be in vain. As a consequence, the first research question aims at finding the main bottlenecks blocking general and widespread use of Planning Support Systems in spatial planning?

A systematic overview of reasons for under-usage of PSS

To find the answer to the first research question, a questionnaire has been distributed globally among PSS-developers and –users to gain more insight into the reasons obstructing general and widespread use of Planning Support Systems. The sources for the questionnaire are threefold.

The first source are theoretical frameworks from the fields of Management Information Sciences and Innovation Sciences. These sources were encountered by realizing that the research question was in fact a specification of a more general question to reasons for acceptance and usage of any IT-based system. These types of questions are subject for the fields of Management Information Sciences and Innovation Sciences. Literature from these fields provides several theoretical frameworks showing underlying reasons for the individual and organizational decision to accept or reject IT-based systems (Rogers 1983, Davis 1986, Venkatesh and Davis 1994, Goodhue and Thompson 1995, Dishaw and Strong 1999, Venkatesh and Davis 2000, Frambach and Schillewaert 2002). A theoretical framework on acceptance of IT-based systems in general is not enough to fully explain acceptance and continued usage of specific systems, such as Planning Support Systems. A set of alleged reasons that are specific for under-usage of PSS and proposed guidelines for increasing the job fit, found in literature on PSS and a set of alleged reasons explaining under-usage of the quite affiliated technology GIS was used as a second source for the questionnaire, to supplement the theoretical framework (Crowell 1993, Brail and Klosterman 2001, Geertman and Stillwell 2003b). Third sources are the authors' and their colleagues additions to this set of reasons.

The list of potential reasons obstructing general and widespread use of Planning Support Systems was developed into a questionnaire. In this questionnaire respondents were also asked to evaluate the importance of the reasons in explaining under-usage of PSS. Furthermore they were asked to fill in reasons that were to be taken away by research with priority and to give their ideas on how to take away the reasons that block widespread usage and acceptance of PSS in planning practice.

## 5. RESULTS

At the AGILE conference, the first results of this questionnaire will be presented. The approach followed to obtain the results for the first part of the research project is innovative in the sense that no previous attempts have been undertaken to make a systematic overview of reasons for under-usage of PSS, based on a well-founded theoretical frameworks of organizational and individual technology acceptance/innovation adoption and implementation and on a global scale. Results of some earlier attempts to develop such an overview of reasons are shown in PSS literature (Harris and Batty 1993, Brail and Klosterman 2001, Gaunt and Jackson 2003, Geertman and Stillwell 2003a, Snyder 2003), but neither of these is based on a binding theory comparable to the framework of Frambach and Schillewaert, nor is any of these based on a global inquiry.

The results to be presented will consist of a systematic overview of reasons for under-usage of PSS in planning. Moreover, the first thoughts of how to tackle these barriers will be presented. Unfortunately it was impossible to already include these results in this paper, because the analysis still had to be done at the closing date for submitting papers.

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