Chapter 3
Modelling & Matching and Value Sensitive Design:
Two Methodologies for E-Planning Systems Development

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ABSTRACT
In this chapter the authors present two methodologies: Modelling & Matching methodology (M&M) and Value Sensitive Design (VSD), which can help address the knowledge gap in the methodologies for designing e-Planning systems. Designed to address the requirements of diverse user groups and multi-disciplinary cooperation for systems development, these two methodologies offer operational guidance to e-Planning systems developers. After the background introduction on e-Planning systems, these two methodologies are described, along with their application in two projects, namely VEPs and UrbanSim. This is followed by suggestions for the further work and conclusions.

INTRODUCTION
Cities are dynamic living organisms that are constantly evolving. Thus city planning has always been difficult. Today our rapidly changing society makes the job of predicting future needs of city dwellers, and those who depend on the services cities provide, even more problematic. Particular problems include: transport, pollution, crime, conservation and economic regeneration. Thus in addressing the complex problems of city planning it is not sufficient just to be concerned with the physical structure of the city; the interplay of intangible economic, social and environmental factors needs to be considered as well.

Those involved in the sophisticated art of city planning use a variety of tools. Many authors argue that Information Communication Technologies...
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(ICTs) offer the potential to improve the current situation in the consultative urban planning process, in particular the Internet, Geographic Information Systems, and Virtual Reality. The rapid development of these technologies provides new opportunities to improve the planning processes and make better use of resources (Dollner et al., 2006). Recently it has become clear that in order to provide more efficient city management and administration, it is important to design holistic systems that integrate information from city authorities, utility and transport system providers etc (Hamilton et al. 2005; Knapp et al., 2009).

E-Planning systems are a new variety of information system for use in urban planning, with the goal of making the urban planning process more effective and efficient with appropriate ICTs. Nowadays, many countries around the world intend to modernise the planning process or have already initiated such movement (ODPM, 2004).

An e-Planning system is a complex information system that involves integration of various new technologies and interaction among multiple user groups. However, the vast literature that covers computer use for e-Planning systems arguably devotes insufficient attention to gathering requirements of different user groups and to the system development process. Effective development methodologies are needed to ensure that new technologies are matched to required functionality, and that successful e-Planning systems are implemented. In addition, the technical problems of creating an integrated ICT infrastructure to support e-Planning systems development are considered not to be the most difficult challenge (Curwell & Hamilton, 2003). Greater concern is expressed over social, human and activity issues, which should be addressed in a system development process.

In her PhD research, Chen has identified significant gaps in current knowledge regarding appropriate development methodologies for complex system development that involves multiple stakeholders, such as e-Planning systems (Chen, 2007). It also shows that the individual Information System Development Methodology (ISDM) does not offer a total solution that address both ‘soft’ and ‘hard’ perspectives in the system development process. Hence, this chapter is intended as a contribution toward the development of hybrid methodologies that can provide sufficient support to e-Planning systems designers. This chapter concentrates on how multiple stakeholders can be involved in the design process of e-Planning systems and how system designers can work together to identify goals in terms of cities designing via appropriate system development methodologies; so that the systems produced can enhance the planning process.

The chapter starts with the general investigation of e-Planning systems from its definition, current applications for both professionals and general public, and future trends. These investigations indicate challenges of the development of these systems. The potential solutions to address these challenges are discussed in the second part of this chapter, which presents two approaches that we believe will be useful for e-Planning systems development: Modelling & Matching, and Value Sensitive Design. The intended outcome of the application of both M&M and VSD is improved planning systems, in terms of better alignment to planning needs.

The Modelling & Matching (M&M) methodology (Chen, 2007) aims to address the need to develop systems that satisfy the requirements of stakeholders who display wide variance in terms of domain knowledge and motivations. In addition, it focuses on the appropriate process to facilitate cooperative system development engaging multi-disciplinary professionals, and to integrate technical design into the knowledge management/structuring process. M&M brings together many approaches and bridges the design/implementation gap by providing different design models with immediate feedback from stakeholders that is so lacking at present.

Value Sensitive Design (VSD) is a theoretically grounded approach to the design of technology
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