Perspectives on HCI Patterns: Concepts and Tools

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INTRODUCTION

"Patterns" were defined and named by Christopher Alexander within the domain of architecture [2, 3]. In his writings he espouses an approach to design that focuses on the interactions between the physical form of buildings and the way that form impacts personal and social behaviour [4]. Important aspects of his patterns are:

- They were devised with the express intention of providing a common vocabulary between users and architects, as well as among architects themselves.
- Patterns are not created or invented; they are identified via an invariant principle (of good design) as manifest across different places and cultures.
- They are structured around the problems that designers face, and those problems are addressed by "solution statements". As such, patterns are embedded in practice, addressing recurrent problems with invariant solutions.

Each "pattern" follows a prescribed form based on evidence, examples, and use, and has instructions for how to achieve its effect. A pattern is named, and illustrated with a photograph and diagram. The 253 patterns identified are collected into a pattern "language" (PL), which allows them to be used in combination (often with patterns at different scales) so whole environments can be constructed.

Other groups have tried to use this pattern approach in domains such as software [7, 8], pedagogy [9], e-business [1], and for "shaping the network society" [6]. From at least 1997 [4], CHI researchers have explored the role that patterns and pattern languages might play in interaction design. There have been two key motivations:

- It is relatively easy to make an analogy between the domains of architecture and UI design, based on concern for the effect of a constructed artifact on personal and social behaviours.
- Alexander's patterns (the "first encounter" with patterns for most) "make sense" to designers. They also are written compellingly and elegantly.

THE IMPORTANCE AND TIMELINESS OF THE TOPIC

Perhaps because of the strong (positive) reaction to Alexander's work, efforts to construct a PL for HCI have been dominated to date by a search for *'the'* form for individual patterns. With the notable exception of Tidwell [10] only very recently has there been work that starts to look at putting these individual instances together, in fragments of pattern languages [5, 11]. As these "collections" have emerged, work has polarized and small groups have formed taking specific (and often divergent) stands. This has had several effects. Firstly, it is hard for a "pattern newcomer" to grasp the scope and potential of the form, as it is difficult to pick out common features from the low-level (and somewhat chaotic) body of work. Secondly, the breadth and richness afforded by multiple perspectives has been obscured, as workers in this area have narrowed focus to doing patterns "their way". Thirdly, the conceptual strengths are concealed by obsession with low-level detail and there is little consideration of what *makes* a pattern a pattern – or a language a language.

In addition to conceptual issues there are further issues tied to pattern creation and use. Both of these activities have the potential for facilitation by tools. However, to date, there is little existing tool support. Indeed, there is little

even understood about the activities involved in both creating and using patterns.

Patterns may be used in different ways depending on users' domain skills and their roles as, say, designers, developers or educators. A tool could provide role-specific support. For example, a pattern writer may use a tool to make a set of patterns more consistent in terminology, to organize and interrelate patterns, and to see gaps and contradictions in a pattern language. Developers may use a pattern tool to select, organize, and edit patterns relevant to a specific task, and to find relevant software components, configured appropriately using knowledge embodied in the patterns. A student may use a tool to learn about the problems, contexts, and solutions that occur in the field of HCI.

THE GOALS OF THE WORKSHOP

The workshop has two main goals. The first relates to the conceptual issues - to explore and share a diversity of perspectives on patterns and pattern languages for interaction design, HCI, and related design activities. We aim to take "half a step backwards" and consider issues of why (and how) patterns are created and how and when they are useful in the design process. We aim:

- To identify what is *important* in the area, what is fundamental to patterns as applied to HCI;
- To enhance our understanding of the *concept* of patterns and pattern languages in relation to other theoretical models used in design;
- To work towards the creation of a "map" of the conceptual territory of the pattern endeavor.

The second goal is to understand how computer tools can best support the various activities involved in both the creation and consumption of patterns and potential software components relating to the patterns. We aim:

- To create a shared understanding of the needs and activities of the diverse groups of people involved in pattern creation and pattern use;
- To identify ways in which the capabilities of the computer can enhance and support these activities.

PLAN FOR CONDUCTING THE WORKSHOP

The main activities to achieve our first goal will be discussion and presentation of alternative positions, based upon submissions. Participants will be expected to prepare responses to two other position papers and facilitate discussion for those papers. The organizers will mediate discussion throughout and encourage the initiation of discussion prior to the workshop using an electronic forum. Detailed discussion of issues arising from these activities will provide the basis for the mapping activity.

To achieve our second goal, we will explore the needs and activities of different potential creators and consumers of HCI patterns. Through a set of activities ranging from role-playing, to pattern organization exercises, pattern design, and solution-finding tasks we will try to abstract critical thought and behavioral processes that could be supported by tools. Then participants will use one or more existing tools in activities crafted to elucidate the issues identified. Through these discussions and hands-on exercises we aim to achieve a consensual set of issues and requirements, and begin to design for the next generation of pattern tools.

At the end of this workshop we hope to have a better understanding of the conceptual issues related to patterns and their use, and a clearer view as to how computer-based tools can support pattern related endeavors.

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