Chapter 8

Implications of Markup on the Description of Software Patterns

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ABSTRACT

The reliance on past experience is crucial to the future of software engineering. There are a number of avenues for articulating experiential knowledge, including patterns. It is the responsibility of a pattern author to ensure that the pattern is expressed in a manner that satisfies the reason for its existence. This chapter is concerned with the suitability of a pattern description for consumption by both humans and machines. For that, a pattern description model (PDM), and a pattern stakeholder model (PSM) and a pattern quality model (PQM) as necessary input to the PDM, are proposed. The relationships between these conceptual models are highlighted. The PDM advocates the use of descriptive markup for representation and suggests the use of presentation markup for presentation of information in pattern descriptions, respectively. The separation of representation of information in a pattern description from its presentation is emphasized. The potential uses of the Semantic Web and the Social Web as mediums for publishing patterns are discussed.

INTRODUCTION

There are different kinds of conceptually reusable experiential knowledge in software engineering (Garzás & Piattini, 2007). In the past few decades, patterns (Buschmann, Henney, & Schmidt, 2007b) have emerged as a kind of knowledge garnered from past experience that has proven to be effective. Indeed, over the years, patterns have been ‘discovered’ in and applied to a variety of domains (Rising, 2000), including software engineering. For novices, patterns serve as means of guidance; for experts, they serve as means of reference.

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However, any kind of knowledge is only as useful as it is expressed, and the same applies to patterns. The usefulness of a pattern is severely hindered (Kohls & Uttecht, 2009) if it is not described properly. For example, difficulty in reading a pattern description may not be productive and poses an obstacle to any further realization; difficulty in understanding a pattern description presents a potential for its misapplication; difficulty in transforming a pattern description is a hindrance to making it available on different computing environments; and so on.

The rest of the chapter is organized as follows. First, the background necessary for further discussion is given and related work is presented. Then, conceptual models for stakeholders of patterns, quality of patterns, and description of patterns are proposed. Next, directions for future research, including challenges in addressing them, are outlined. Finally, concluding remarks are given.

**BACKGROUND**

In this section, a synopsis of terminology related to a pattern description and a brief introduction to the notion of markup pertaining to the scope of this chapter are given.

**Basics of Patterns**

The pattern domain is the universe of discourse for all things related to patterns. The pattern body of knowledge (PBOK) is the set of fundamental concepts, activities, and results that characterize the pattern domain.

There are certain basic concepts in PBOK that are of interest. A pattern is an empirically proven solution to a recurring problem that occurs in a particular context. A pattern application domain is the area of study to which a pattern corresponds to. An anti-pattern suggests a ‘negative’ solution to a given problem. A pattern language is a collection of patterns that are closely related to each other through their individual contexts and contribute towards a common goal.

There are other concepts in PBOK that are of interest. A pattern description is a set of indicative statements that specify a pattern. A pattern description, if structured, typically consists of a number of elements. A pattern element is a labeled placeholder for information that accentuates a certain aspect of a pattern. A pattern form is a prescription of a specific set of pattern elements that are expected to appear in a pattern description. A pattern thumbnail is a succinct depiction of a pattern. A pattern collection is a set of patterns that are specific to some pattern application domain and correlated in some manner. For example, a pattern language is a pattern collection; however, the converse is not necessarily the case in general. A pattern documentation is a document describing how a specific pattern can (and even should) be used. It could be noted that, for the sake of this chapter, the terms ‘pattern description’ and ‘pattern documentation’ are not synonymous (and therefore not interchangeable). A pattern sequence is a sequence of patterns through one or more pattern collections. A pattern story is an instance of a pattern sequence.

**Significance of a Pattern Description**

An appropriate pattern description is crucial for a number of reasons. These are discussed in the following.

**Relationship of a Pattern Description to Pattern Acquisition**

The acquisition of a pattern is one of the integral steps in pattern usage. The knowledge of mere presence of certain patterns, especially in an electronic medium, is not always sufficient for acquiring any of those patterns easily, if at all.