Chapter 4
Modeling and Language Support for the Pattern Management

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ABSTRACT

Patterns are mentioned usually in the extraction context. Little stress is posed in their representation and management. This chapter is focused on the representation of the patterns, manipulation with patterns and query patterns. Crucial issue can be seen in systematic approach to pattern management and specific pattern query language which takes into consideration semantics of patterns. In the background we discuss two different approaches to the pattern store and manipulation (based on inductive database and PANDA project). General pattern model is illustrated using abstract data type implemented in Oracle. In the following chapters the introduction to querying patterns and simple scheme of the architecture PBMS is shown.
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INTRODUCTION

Sophisticated data processing tools (pattern recognition, data mining, knowledge extraction, etc.) were designed and developed because of reduce user interference in the process of extracting knowledge artefacts from the data. These knowledge artefacts denoted as patterns are characterized by a high degree of diversity and complexity. The problem of storing and manipulating patterns has limited attention in comparison with attention to the knowledge extraction techniques. So far patterns have not been exhaustively treated in terms of their storing, retrieving and querying. There is a leg of management systems that can provide support for general pattern definition and manipulation.

Like data also patterns can be modelled, stored, manipulated and queried. Patterns can be seen in the similar way as entity in data modelling. In reality there is innumerable amount of entities and process of data modelling is focus on finding them in connection with its specific domain. Modelling patterns is also finding specific types of patterns in connection with knowledge extracting techniques. For example, patterns can be modelled as association rules, clusters, time series data, etc. To be able to manipulate patterns with their generic structure we have to incorporate all kinds of patterns. These ideas were introduced in (Rizzi, Bettin et al. 2003) and also for some kinds of pattern indication for implementation were shown (Catani, Maddalena & Mazza 2005). Another approach to the manipulation of patterns was developed in inductive databases. Inductive databases do not work with generic patterns but focuses on specific pattern categories. Some object – relational databases also solve problem of specific kind of patterns, mainly for pattern’s extraction from time series data.

The goal of the chapter is to describe three approaches mentioned above and introduce the design of solution based on enlargement object - relational approach to the idea of generic pattern structure.

BACKGROUND

In general, a pattern can be defined as a compact and rich in semantics representation of raw data (Catania, Maddalena, & Mazza, 2005). Patterns can be generated from different application context. Usually patterns are extracted by using some data mining tools or other pattern recognition tools. Raw data from which the patterns are extracted change with high frequency. The question is whether existing patterns still represent the data source. It is clear that any tool for providing manipulation with patterns not only in terms of changing pattern information can be useful for users.
Modeling Agent Interactions using Common Ground Knowledge from a Joint Activity Theory Perspective
www.igi-global.com/article/modeling-agent-interactions-using-common-ground-knowledge-from-a-joint-activity-theory-perspective/108927?camid=4v1a

Development Support of Learning Agent on Repository-based Agent Framework
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