

Chapter XXIV

Database Support for Workflow Management Systems

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INTRODUCTION: WORKFLOW SYSTEMS

A workflow is a series of work processes performed under rules that reflect the formal structure of the organization in which they are carried out and the relationships between their various parts. Workflow applications are software applications used to automate part of workflow processes. They run under the control of a workflow management system (WfMS). The WfMS usually comprises an organizational model, describing the process structure, and a process model, describing the process logic. The Workflow Management Coal-

ition (WfMC, 2008) publishes a set of workflow definitions and related material, including a reference model.

Databases are commonly used as a WfMS supporting technology. Not only workflow data are maintained in databases but also the rules governing processes can be stored in database schemas. Database functionality can be used both for defining and managing process models as well as for environment notification and process enactment. This article shows how particular database-related technologies can be used to support WfMS.

Table 1 relates workflow issues and the database technologies that can be used to deal with them. It summarizes the content of this article presenting the relationships discussed in the text. The next two sections discussing workflow management issues and database support are related to the columns and lines of the table and provide an explanation for these relationships. Only the general relationships stressed in the text are shown. For example, data replication and partitioning have an influence on scalability and privacy but the table does not show the same influence with respect to distributed database technology, although data replication and partitioning are basic strategies of distributed databases.

BACKGROUND: WORKFLOW MANAGEMENT ISSUES

Workflow applications are usually complex, distributed applications consisting of activities performed by people playing different roles, sometimes involving multiple departments and organizations. It is not unusual for different workflows to be governed by different WfMS running under a variety of platforms, application servers, and communications middleware. This situation requires ways of dealing with diversity and complexity and imposes a need for interoperability and scalability. Other issues like heterogeneity,

Table 1. General relationships between workflow issues and database technologies

| | | ENVIRONMENT | | | PEOPLE | | | PROCESS | | | DATA | | |
|-----------------------|----------------------------|-------------|------------------|-------------|--------------------|-------------|-----------|---------------------|-------------|---------|---------|----------|------------------------|
| | | Diversity | Interoperability | Scalability | Collaborative work | Flexibility | Evolution | Assignment of tasks | Consistency | Changes | Privacy | Location | Semantic heterogeneity |
| DATABASE TYPES | Distributed | ✓ | ✓ | | | | | | | | | | ✓ |
| | Parallel | | | ✓ | | | | | | | | | |
| | Multi | ✓ | ✓ | | | | | | | | | | |
| | Active | | | | | | | ✓ | | | | ✓ | |
| DATABASE TECHNOLOGIES | Data replication | | | ✓ | | | | | | | ✓ | | |
| | Data partitioning | | | ✓ | | | | | | | ✓ | | |
| | Synchronization techniques | | | | | | | | ✓ | ✓ | | | |
| | Transaction models | | | | ✓ | ✓ | | | ✓ | | | | |
| | Schema | | | | | ✓ | ✓ | | ✓ | ✓ | | | ✓ |
| | Metadata | | | | ✓ | ✓ | ✓ | | ✓ | | | ✓ | ✓ |

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