Chapter IX

Applying JAVA-Triggers for X-Link Management in the Industrial Framework

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ABSTRACT

This chapter focuses on referential link integrity problems. In the industrial context, the life cycle of a document plays a central role in describing the "steps out" of a product. Users realize some manipulations like creation, edition, suppression and querying under a multi-user environment, risking possible destruction or the alteration of the document's integrity. A classical impact is the infamous "Error 404: file not found." However, the user needs a notification alert mechanism to prevent and warrant the coherence of manipulations over all the life cycle processes of a product. The main objective of this chapter is to provide a generic relationship validation mechanism to remedy this shortcoming. We believe in the combination of some standard features of XML, specifically XLL specification as a support for integrity management and Java-Triggers approach as an alert method. This study, compared with actual approaches, proposes a solution based on active functionalities.

INTRODUCTION

The business contributions of intranet applications have proven that this technology is a golden approach to support corporate Web-based systems (as stated in Balasubramanian et al., 1997, 1998). Increasing in number, all kinds of organizations are taking advantage of intranets to propagate structured documentation (e.g., technical, medical, academic, etc.). Intranet technology is well used to enhance organizations' business strategies (Bonifatti, 2000). The current Web and intranet services are short of referential integrity support. In this study, the coherence problem means that a link depends on the "state" of the referenced document. When documents are edited or revised, locations can probably be altered, with the potential risk of destroying the record of a linked text. Observable examples are broken links and dangling references, arguably two of the most unwanted problems in distributed domains.

Another frequent problem is resource migration. Experience has shown that Web resources often "migrate" during the reorganization of hardware resources (e.g., as a result of an increase in the volume of information published by a given site).

The question is how to preserve the link integrity when, at any time, document links can be altered in some way, with the potential risk of destroying the record of a linked text (broken links). The main purpose of this chapter is to provide a generic relationship validation mechanism to keep the link references in a "coherent state" over all processes involved. It proposes a solution based on active functionalities. Our approach is based both on the definition of ECA rules and Java-Triggers Technology; the rules are used as alert mechanisms. Therefore, some standard features of XML, highlighted in the XLL specifications (X-link and X-pointer) presented by the XML-Linking working group, will be considered in this work as a support for integrity management.

BACKGROUND

In the literature we have found several research and development projects addressed to referential link integrity problem; two main categories of solutions have been proposed: preventive and corrective solutions (Ashman, 1999, 2000).

Preventive Solutions

- **Forbidding changes:** is a preventive strategy, the modification of documents is not authorized (Thistlewaite, 1995). Links pointing to documents or part of documents should not fail.
  - This approach does not provide a protection in cases where the host information is changed. Addressed to link update problem only.
- **Versioning:** is one of the main issues in the hypermedia field adopted by Vitali (1999) and Nelson (Theodor, 1999). The changes in the document are permitted by the creation of a newer version and are notified to the reader. Thus, the document changes as new versions become the active document. In summary, versioning provides an easy and safe solution to the well-know problem of referential link integrity.

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