

Svolgo : A Graph Framework

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1 Introduction

The "Svolgo" project's aim is to construct an framework for building applications which require the creation, transformation or visualisation of information found in the web environment that can be represented in a graph model. It is proposed that applications of this type, which could potentially work with any of a wide variety of domains, can be constructed using an internal graph-based model that is abstracted from the domain in question using a transformation mechanism. The transformation mechanism under development is a declarative rule-based system with rules specified in RDF. Considerable work has already been done on the system, but it is still early days, though initial experiments have shown promise.

2 Motivation

It has been suggested that one of the key issues retarding the evolution of the current web into a Semantic Web is the lack of tools. There are already at least two tools for graphically creating and editing RDF, and there are numerous tools that can perform various kinds of transformation on RDF datasets. Few of these tools however do much to bridge the gulf between real-world users of information in specific domains, and the generalised RDF description of that information. It is hoped that this project will go some way towards bridging the gulf. For example, there is a reasonably standardised model and syntax for genealogical data (GEDCOM), but tools intended for working with this information are predominantly limited to this closed domain. If a mapping was drawn between this structure and a generalized graph, then the information could be manipulated in the latter form. The user could be oblivious of the internal representation, and modified data could be stored back in the GEDCOM format. The key advantage in this approach is that the internal representation could also be output to a different model and syntax, based on another mapping.

3 Implementation

The framework is being developed in Java as the object-oriented paradigm fits well with the approach to modelling, and is reasonably platform independent. Availability of the Jena RDF Toolkit and the Batik SVG Toolkit was also a significant factor. The basic architecture used is strongly suggested by the model structure - classes to represent graphs,

vertices and edges. The initial temptation to make extensive use of inheritance was curtailed when it was found that not only did code get confusing, but that the lack of multiple inheritance in Java made for painfully inelegant solutions. The current approach features parallel trees extended from the core model, with change-event passing used to maintain synchronization between different representations.

4 Current Status

The system implemented to date can carry out certain simple transformations, and visualisation is possible using Scalable Vector Graphics as the target representation. The architecture is such that interactive applications will be possible, and development of a graphical user interface using Java Swing is well advanced. Work has begun on developing a generalised method in which the transformation rules may be specified declaratively using RDF. Languages/models currently supported (to wildly varying degrees) include : arbitrary XML (DOM model); RDF; GraphXML; RGML; GraphViz. Areas in which work is planned in the near future include :

Integration of User Interface This will need considerable work to couple the required user-friendliness with core functionality.

Transformation Schema Further work is needed on the RDF Schema used to define the transformations. In addition, linkage is required between statements in the Schema and (RDQL) queries to carry out mapping of resources.

Groves The mapping between a graph and tree (or vice versa) can be quite knotty, and one possible way of simplifying the task might be to use an intermediate grove representation.

5 Further Information

Source code, examples and documentation are available from <http://www.isacat.net/2002/svolgo/index.htm> and the author may be contacted using danny@isacat.net. Significant developments will be announced on the W3C RDF-Interest mailing list.