An eXtensible Web Modeling Framework*

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1 Introduction

This document presents the eXtensible Web Modeling Framework (XWMF) which is based on the Resource Description Framework (RDF) [5, 10]. Both frameworks use metadata to describe properties of web resources. Our proposed framework applies the same (meta-) data model to reason about web site data, and to specify the structure and content of a web site and making statements *about* the elements of a web site. A formal model defining the various properties can lead to a consistent structure and easier maintenance. The formal model of the XWMF results in machine-understandable and interoperable content- and meta-data of a web site. The data model is capable to structure information from small units such as elements or single web pages (for *authoring-in-the-small*) to large structures such as web sites (for *authoring-in-the-large*). The formal model of XWMF can lead to the development of better software tools supplying web site development and maintenance.

2 XWMF

XWMF is a proposal of how to apply the RDF schema specification [5] to constrain the structure and logical content of a web page/site and to issue statements about elements of a web page/site. The statements assign instances of properties which are defined by a set of RDF schemes for various application areas. Instances of these additional schemes can be interpreted by various applications such as web site modeling and maintenance.

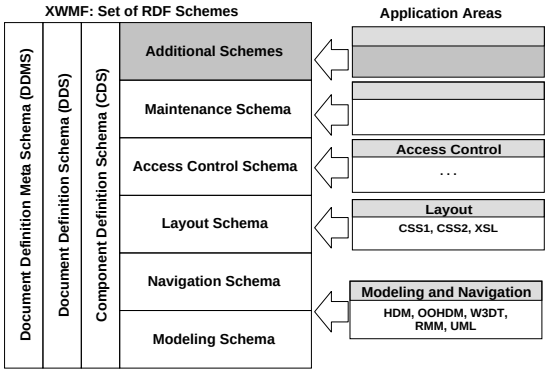

Figure 1: XWMF

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An RDF schema can be used to constrain the structure and content of a web page in a similar manner as a document type definition (DTD) [4]. We call such a DTD schema a *Document Definition Schema* (DDS). The RDF schema specification [5] does not define a vocabulary to express everything expressible by a DTD. Instead, it specifies the mechanisms needed to define properties, to define the classes of resources they connect, to restrict possible combinations of classes and relationships, and to detect violations of those restrictions. A DDS is specified by defining a set of classes representing the (content of) elements of a web page. For defining constrains similar as a DTD a DDS uses properties which are predefined in a *Document Definition Meta Schema* (DDMS).

We developed an editor as a support tool to experiment with the XWMF approach. Currently the XWMF-editor is mainly an RDF editor for the graphical development of RDF models but is able to process a DDS. The editor can save application models in different formats including the triple notation of an RDF model according to the RDF model and syntax specification and also in serialization syntax of using XML.

3 Related Work

As described a DDS is an RDF schema with a similar intent as a DTD. There are several approaches such as Document Content Description for XML (DCD) [3], Document Definition Markup Language (DDML) Specification [2], Schema for Object-oriented XML (SOX) [7], XML-Data [12], XSchema [11] which define constraints for XML documents as well. These approaches focus on defining constraints of the structure and content of a single XML document class. In contrast to these approaches the DDS is a part of a general and interoperable framework (XWMF). Additional schemes can define constraints (properties) on the relationships of classes of web pages (structure of a web site) and properties for maintenance, layout, etc.

4 Conclusion and Future Work

In general XWMF can coexist with various web modeling approaches and methodologies, especially when the approach focuses on assigning properties to objects or classes. Examples for suitable modeling approaches include HDM [8] , OOHDM [14] , RMM [9], W3DT [1] for example. The general modeling language UML [13] can also be used to model a web site. For a discussion of the relationship between the RDF schema and UML see [6]. We plan to develop RDF schemes which can be used similar or in conjunction with web modeling approaches. Furthermore we plan to develop a set of more detailed RDF schemes for application areas such as web site development and maintenance.

Improvements of the XWMF-editor should ease the development with XWMF. The editor should be able to transform a XWMF model to the corresponding XML documents. Some of the additional assigned information such as layout information is used to generate the XML documents and some may be used for maintenance of a web site.

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