

Chapter 1

Application Profiles: An Overview

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ABSTRACT

Application profiles fulfill similar functions to other forms of metadata documentation, such as data dictionaries. The preference is for application profiles to be machine-readable and machine-actionable, so that they can provide validation and processing instructions, not unlike XML schema does for XML documents. These goals are behind the work of the Dublin Core Metadata Initiative in the work that has been done over the last decade to develop application profiles for data that uses the Resource Description Framework model of the World Wide Web Consortium.

INTRODUCTION

The days in which one could invent their own metadata schema without concern for existing standards or data exchange are long over. Today's data is social if not entirely promiscuous in its relationships with other data stores. The transition from closely held and private data to data that is intended to intermingle with the data of others calls for new tools to facilitate that sharing. Anyone who has undertaken to mix data from more than one source in a single application knows that there is much more that needs to be known beyond the names of data elements. Not only must one know what kind of data to expect, and how much of that data, but one also needs to know the choices that were made in the creation of the data.

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Much effort takes place in data processing in the cultural heritage and scientific communities on the development of what are called “cross-walks.” These are analyses that create equivalencies or near-equivalencies between different metadata schemas and that allow sharing data with others or aggregating data from multiple sources. The time and intellectual energy needed for creation of cross-walks and the subsequent programming to convert one set of metadata into a different metadata format is onerous. At least some of this is due to the lack of a standard to create a machine-readable schema definition that could be used by others. This is not just a data definition, such as “date = yyyyymmdd” but information about the semantics of the schema itself. Is the date field required? Can there be more than one author? Does this community’s ISBN field contain both ISBN-10’s and ISBN-13’s? What does “title” mean in this data - will it include subtitles or not?

Many programmers and analysts have experience in this kind of data transition, and many person-hours have been spent on it. Clearly this is an area where standardization could save a great deal of time.

Those exchanging data have commonly used documents to convey this information among their community of metadata sharing, but few of those documents are machine-actionable; a metadata schemas described in written documents are still very common. Although it has been acknowledged for a time that better and more standard documentation for data exchange is needed, we still do not have a satisfactory solution.

Some Examples of Data Documentation

The need to document and describe the elements and rules of computing practice are almost as old as computing itself. Early data definitions were not only not machine actionable, they were often paper documents with no actual connection to the machine-readable data. Many data standards still are issued as non-actionable documents, even in the major standards organizations like the International Standards Organization. The disadvantages of these paper schemas are obvious, from the problem of keeping them up to date to the fact that they cannot be tested against actual data. Over time, members of the computing community worked to rectify this disjunction between the machine-readable data and the human-readable documents that explain the data. Of these methods are data dictionaries, used with database management systems, formal modeling languages, like the Unified Modeling Language, and the schema standard for eXtensible Markup Language (XML) documents. These are familiar examples, but this is not a complete review of data profile methods.

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