# Personalization and Accessibility: Integration of Library and Web Approaches

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## ABSTRACT

This paper describes personalization metadata standards that can be used to enable individuals to access and use resources based on a user's particular requirements. The paper describes two approaches which are being developed in the library and Web worlds and highlights some of the potential challenges which will need to be addressed in order to maximise interoperability. The paper concludes by arguing the need for greater dialogue across these two communities.

## Categories and Subject Descriptors

H5.2 [Information Interfaces and Presentation]:  User Interfaces - Standardization

K4.2 [Computers and Society]: Social Issues – Assistive technologies for persons with disabilities

## General Terms

Human Factors, Standardization

## Keywords

Metadata, accessibility, IMS, MARC.

## 1. USER CONTEXT FOR ACCESSIBILITY METADATA

In order to illustrate the potential benefits of using metadata for personalization to enhance the accessibility of networked services, two scenarios are provided which aim to illustrate the issues in context:

1.  At home, Alex uses a Virtual Learning Environment (VLE) to find recommended books and learning objects suitable for visually impaired users for his distance-learning course.

2.  At a public library, 14 year-old Bernie searches the local catalog for pictorially-rich information for an advanced school project; there is nothing suitable for a dyslexic student, so what can she do to widen her search?

These scenarios show resources must not only meet needs in terms of appropriate content and authorized access to the resource, but also with regard to the accessibility (or usability) of the resource for the individual user. So let us consider the approaches taken by the library and Web worlds.

## 2. THE MARC APPROACH

MARC 21 format [1], developed in 1965, is a metadata schema for electronic library catalogs that is widely used for online public access catalogs (OPACs). The format is based on cataloguing rules (AACR2) and international standards for resource description (ISBD).

Over time MARC 21 has been extended to include other resources (e.g. audio, audio-visual, maps, etc.) as well as books and journals. It can hold information about target audience, reading age, curriculum subject and level, restrictions on access, and the form and size of the resource. There are, however, still gaps relating to accessibility. For example, precise format information (the spacing of Braille text, or digital audio file structure) would be useful.

Extending the format elements and using existing fields better would provide benefits: search interfaces could be designed to filter for certain formats: 'no Braille' (the user can't read it) or 'audio cassettes only' (the user doesn't have a CD or MP3 player). Filtering could use combinations of parameters to find resources appropriate for, for example, an age group, reading level or educational level.

Alex might start from a VLE reading list, use the library catalog to find only digital and audio items, and follow a URI to an online journal accessed via speech synthesis software. Alex might then return to the VLE and find that some alternative forms of physical learning objects are held in the library.

Bernie could cross search a number of public library catalogs for 'talking books', thus maximizing use of each library's typically small collection of this format. Having found appropriate titles, she could then request them using inter-library loan.

System change can be slow and should be undertaken with care. Libraries may request new functions when changing systems (usually every 5 years) but budget constraints usually dictate 'off the shelf' products, so changes depend on vendor support. Vendors may resist changes and they always need time to implement them. Academic libraries face an additional problem as VLEs are often not part of the library system and interoperability between catalogs and VLEs can be non-existent or limited.

## 3. THE ACCESS FOR ALL APPROACH

AccessForAll is an approach to delivering resources where a resource can have distributed adaptations that replace or augment it in order to meet the immediate context.

A user's functional requirements and preferences for that delivery context are stored in a Personal Needs and Preferences profile (PNP). The PNP describes requirements in terms of control, display and content rather than descriptions of disability. Such functional requirements can be equally useful to people with disabilities and others in disabling contexts, caused by devices, circumstances, etc.

Associated with each resource is Digital Resource Description (DRD) that identifies associations between a resource and available alternatives and describes the accessibility properties of that resource or adaptation in a way that can be used to select resources that match a user's PNP.

The AccessForAll approach is being implemented in metadata in ISO [2] in co-ordination with IMS [3]. A collaboration, including the CEN-ISSS Learning Technologies Workshop [4] and the Dublin Core Accessibility Working Group [5] aims to develop a metadata model that will suit many communities, at least being interoperable with other metadata and perhaps even to be included with it. Web-based services and VLEs, in particular, are expected to adopt this approach.

## 4. INTEGRATING THE APPROACHES

In order to illustrate the need to coordinate the approach taken in the library world and the AccessForAll approach, consider the following scenario. Within a virtual learning environment (VLE) it may be possible to provide an accessible learning experience through the automated, dynamic integration of appropriate resources. Within the context of a 'blended learning' approach, where non-digital resources and human services are involved, some of the resources will be physical objects and their metadata may be only in a particular library's catalog. Clearly, it would be desirable for the VLE to be able to access data held in the library catalog in order to alert the student to the availability of any available accessible physical resources.

In the absence of known alternatives, the AccessForAll replacement/augmentation approach requires a search process to discover alternative content which may be located in many different sectors – educational portals, specialist producers of accessible formats, various types of libraries – and described using different metadata schemas.

In general, it will not just be a matter of recasting the original query. This time, it may need a tailored query to identify alternatives for certain sections of the original content only, and in certain forms. Just what this query will look like is not yet clear but it is likely that it will have to be constructed incorporating some available metadata from the original resource. For example, a query may be needed to find a text version of the sound component of the film of Hamlet with Richard Burton? As this search will need to use available metadata, the compatibility of the metadata in the systems involved will be crucial to its success.

Work will be required on standards already in use in these sectors; although the Z39.50 protocol enables cross searching of library catalogs, for example, this is focused on content and is not concerned with accessibility issues. New developments may, however, be useful; for example, as Functional Requirements for Bibliographic Records (FRBR) principles are incorporated into library standards and a proposed International Standards Text Code (ICTC) is developed, it should become easer to identify items as versions of a resource.

## 5. CHALLENGES

This paper has described the approaches taken to providing and using accessibility metadata by two related communities. In order to ensure interoperability between those sectors several challenges will need to be addressed including:

- Addressing the interoperability of elements being proposed for MARC and AccessFor All.

- Recognizing that different processes and time frames for industry standardization may make decision-making and synchronization of developments difficult.

- Working with a diversity of different standards processes and organizations.

- Establishing convergence across multiple toolsets working with different software technologies in different communities.

- Working with context-related constraints in communities such as libraries, vendors, Web developers, etc.

- Working with differing timescales in the library and Web worlds.

- Developing case scenarios which cover areas of overlap across the two approaches.

- Identifying business cases for deployment of the approaches discussed.

Given an integrated long-term approach by libraries, vendors and the accessibility community, it might be possible to derive substantial benefits. If the issues highlighted above are addressed by appropriate stakeholders, including the relevant standards bodies, vendors (e.g. of OPACs and VLEs) and the user communities (including the educational sector and libraries).

One of the particular challenges to be addressed will be in addressing the tensions between a fast moving Web development environment and a library environment in which the rate of change may be slower.

## 6. CONCLUSIONS

This short paper has given an overview of the approaches being taken in several communities in the development of standards for accessibility metadata to provide access to resources which can be personalized in response to a user's specific requirements. The paper describes possible requirements for systems which may need to access metadata encoded in the different schemas, and outlines the challenges which need to be addressed in order to provide such interoperability.

The authors invite feedback from interested parties who wish to be involved in addressing these interoperability concerns.

## 7. REFERENCES

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