

talis



# Project Maya



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## Executive overview

### **Plugging the expectations gap**

The world of library and information services changed the day Google added book metadata and content to its indexes. Or perhaps more precisely, users' expectations of library and information services changed. As yet, the services have not.

This is a serious problem because today's users want to experience the library in the same way they experience information services offered by other providers like Amazon and Google. They want rich content, which they can interact with directly, and which is available quickly and easily where and whenever they want. Talis has explored this growing 'expectation' gap between what today's internet-savvy users want and what libraries actually provide in previous white papers. Our conclusion is that the library domain must close this gap or risk becoming irrelevant.

It's a tall order but it's not impossible. The technological advances harnessed by innovators, such as Yahoo! and Google, are also available for libraries to exploit. Already there is much talk of a new approach: Library 2.0. It will be difficult though; Library 2.0 relies on an openness that is completely at odds with the closed, monolithic library systems currently in operation.

Consequently, this paper explores one of the most fundamental elements required to make Library 2.0 a reality: the creation of new, open library standards.

## 1. The need for openness in the library domain

### **The drive towards openness**

#### **The 'information' revolution**

The world is currently experiencing something of a revolution in the way that information is created and shared. Along with the explosion in content that the Internet has enabled, people now expect to be able to access that data more easily than ever before.

For libraries this has created something of a challenge. What is their role in this changing information landscape?

#### **Changing consumer expectation**

Consumer expectation is the principle driving force behind any market, and the library domain is no exception. The problem is that new, large internet players in the information domain, such as Google or Amazon, have become such giants in the field of online information search and discovery that the traditional role libraries have played has begun to look a little irrelevant in the increasingly 'connected' world. In fact, research suggests that library users continue to value libraries but are more likely to use Internet search engines (not the library's online presence) to find information.

For libraries to survive, therefore, they need to remain relevant to a new generation of confident consumers of web content. They must be able to utilise similar tools and deliver services in a manner that is familiar to those used to the web experience.

That could mean, perhaps, ensuring that library content and services must be visible to users wherever they want: in university and college Virtual Learning Environments or Course management systems, local authority portals, search engines or, even, sites such as Amazon.

#### **How can the library domain become more open?**

The impact of these changing consumer expectations on the library domain will be dramatic. If libraries must be more open in the way that they make information available to users then some of the fundamental aspects of the library domain will need to be changed.

#### **Changing technology**

The library domain will need to adopt the next wave of technology change, sometimes called web 2.0, if it wants to become more open. It's simple really. Due to the rise of the Internet and web, the world is becoming 'connected'. In its simplest form, we have seen a network of computers connect to each other via the Internet. This idea is now evolving rapidly with applications or systems also becoming connected.

The only trouble is that libraries, and the library management systems they rely on, are currently not prepared for this at all. Traditionally, large monolithic systems have been connected to other large monolithic systems via tightly coupled inflexible integration points.

Inevitably, this tight coupling is fragile. A small change in one component can easily break the whole system. Now imagine trying to connect to other systems. The result would be extremely costly and fragile systems that constantly break as different components change. A group of components would need to be changed together or not at all.

Indeed, that is the situation today. A group of components, such as a cataloguing component and an OPAC component, must only be changed together or not at all. And, typically, that also means that both components need to come from the same vendor if they are to work

together and be updated in synchronisation. This is what we mean by a large monolithic system.

Trying to meet new demands with large monolithic systems is not viable as a recent report from the University of California Libraries entitled "[Rethinking how we provide bibliographic services for the University of California](#)" December 05 starkly states

"We all agree that the cost of our Bibliographic

Services enterprise is unsupportable as we move into an increasingly digital world, yet a solution is nowhere in sight."

The University of California is certainly not alone in this view.

### **Library systems will become more open**

In the web 2.0 world, this model is turned on its head. Instead, components must be loosely coupled to each other so that changes in one component do not break the system.

Of course, there are compelling benefits for this approach. The ability for different systems to be loosely coupled together could enable, for example, a MyYahoo page to be integrated with a LMS system. It also means that the different components of a single system could be loosely coupled so that different parts of the system could be upgraded or swapped in and out as required.

### **Library information will become more open**

This is a radical change for the library domain. Traditionally, library management systems have acted as data silos with information locked in and not available to anyone other than a particular library user. The implications of web 2.0 is not just that systems will be easier and more cost effective to change but that library information will become much more freely available.

### **Library vendors will have to become more open**

These changes will have a knock-on effect on the entire library domain. The 'walled garden' approach where customers had to use new functionality from a single vendor, even if a better solution was available elsewhere, will no longer be the only solution. Now it will be technically possible, and financially viable, for customers to purchase the best of breed components from whichever vendor they prefer. Consequently, it's now important that library vendors begin to work together as collaborators as well as competitors.

This open approach will also drive innovation and competition at a new pace, leading to a radical transformation of the library domain software industry which will prove beneficial to libraries and their customers.

One of the most exciting aspects of technology changing at a rapid rate is that the business model of many library stakeholders will have to become more open too. Over the last ten years, the cost of creating and running global sharing systems, whether for bibliographic or other data, has fallen dramatically. Modern distributed systems can support huge amounts of data and users with ease – and at relatively low cost. Consequently, there is no reason why these systems cannot act as a cheap 'sharing' resource upon which new innovation can be built.

In fact, this change to the business model must happen. History shows that technology can be a real disrupter of business models, a process that has been named 'The innovators dilemma.' Consider, for example, the effect that digital cameras had on huge, global film distribution and processing businesses, such as Kodak.

Here, and with other examples, a slow build-up leads to a 'tipping point' after which change occurs very quickly. The slow start allows an incumbent to ignore the fundamental changes until it is too late and, unless these organisations can change very quickly, they experience a sudden death.

It is no exaggeration, then, to say that it is not just libraries but other organisations in the domain that simply must change. Once these companies begin to realise that they can no longer retain the 'locked-in' business model, these changes will begin to take place.

### **The rise of Library 2.0**

The combination of changing consumer expectations in the information world and changing technology capabilities, in the form of Web 2.0, is driving a radical shake up in the library domain: Library 2.0.

This concept is well documented now and, while it is defined differently by individuals, most agree that it is a world where libraries will adopt a host of exciting new applications to offer users a rich experience of information, which they can find easily either in the library or in a multitude of ways online.

## 2. The need for open library standards

For this vision of Library 2.0 to succeed, library standards must become more open too.

The library world has long had standards, such as Z39.50, Marc, SIP2 and many others, and these have served the domain well for years. However, they were not designed to meet the needs of the Library 2.0 world.

These standards were created many years before the advent of the web and so were not designed to meet the challenges of a 'connected' world. They remain a vital backbone of the library software industry but there is now an urgent need to go beyond these standards.

### **What's the problem?**

#### **Example: Viewing your library account**

'Library 2.0' users want to view their library account details in the places where it makes sense for them. That could be in the VLE or, perhaps, in a MyYahoo page (take a look at [www.yahoo.com](http://www.yahoo.com)).

Today that information is available from an LMS via an agreed NISO standard such as NCIP, a library standard that defines XML requests and responses for circulation related activities. Unfortunately there is no way for users to connect their MyYahoo page to the NCIP protocol. MyYahoo relies on the well-established RSS standard but there is no library domain standard for making information available via RSS.

From a technology point of view, this barrier is small, but the real problem is that library domain standards have often been designed to work well with systems within the library domain but not with the wider world. Clearly, if an aim of Library 2.0 is to make library information available outside the LMS then this situation must change.

New, open library standards are essential to support the flexible, loosely coupled systems described early, and to gain the benefits that come hand-in-hand with this new library 2.0 model.

### **What's the solution?**

#### **Open library standards could transform the library domain**

Introducing new, open standards could lower technical, economic and emotional barriers and enable innovation to flourish.

#### **So what, exactly, could be possible?**

What if circulation information, library statistics and many other valuable pieces of information were available over simple RSS feeds? It would mean that library information could be easily accessed in a variety of places and this information would be available for harvesting into a host of new aggregated services for libraries.

### 3. What sort of standards?

Not all standards are created equal. The web has shown us that you can create powerful yet simple standards and that the adoption rate of these can be truly amazing. Consider, for example, the speed with which the very simple RSS and Atom standards have evolved and been used to support the explosion in blogging. These standards have helped ensure that the dramatic rise in the number of blogs, from almost none to tens of millions in three years, has been fully supported.

What should therefore be considered in the creation of new library standards?

#### **Global standards**

Today, global technology standards abound which is enabling technology to be opened up across continents. Why can this not be replicated with new, open library standards?

Using global web standards and simple data adapters would make it possible to create a standards 'layer' that would liberate data from the library management silo and allow it to be used by applications and services. There would be no need for risky, costly bespoke work; systems would 'just work' with other systems.

#### **Advantages of global standards in the library domain**

The library domain has a long history as a technical pioneer. Z39.50, for example, is an incredibly sophisticated piece of work by an industry that has a deep understanding of metadata and structured searching. Yet, the wider technology industry has never heard of it and certainly doesn't support the specification and infrastructure required.

Continuing to create standards in isolation could lead to more technical isolation and the danger of being left behind as the next wave of technology change sweeps forward.

If, on the other hand, the library domain joins the global effort to drive horizontal technology forward and harnesses the tremendous effort and investment already being poured into it, it will be possible to progress much faster and with much less risk than has ever been possible before.

Right now the challenges being faced by the whole technology industry are closely aligned with the challenges facing the library and information domain. This is why Talis is strongly active in both NISO (library domain) and the W3C (global web standards).

## **Simple, web based standards**

Most would agree that Z39.50 and RSS are both very useful and successful standards. Neither is perfect but both are being successfully applied today to solve real world problems. Can they offer us any lessons for the future of library standards?

### **Z39.50 and RSS: a comparison**

#### **Z39.50**

NISO standard Z39.50 is a library domain protocol standard for conducting machine-based searches. It is a binary standard, a stream of 1s and 0s (ASM1), which means that, unlike XML say, it is not human readable. It uses TCP/IP to communicate rather than HTTP and, therefore, doesn't work with web server or browser infrastructure. This is unsurprising as it was created many years before the web was invented.

In fact, Z39.50 was created by a technical committee within a standards body. It is very complex and requires a significant amount of highly skilled development work to create a working Z39.50 server and a great deal more work to create a Z39.50 client to search servers.

Consequently, creating and deploying Z39.50 servers and client applications is a major investment that requires many people and usually a commercial return on investment. Uptake and deployment is therefore slow. Thankfully, though, some Z39.50 frameworks were open sourced by companies such as Index Data which helped to lower some of these costs.

#### **The risks of this complex standard**

Z39.50 creates a big risk for early adopters: what happens if, after they have spent a lot of time and money, others do not adopt the new standard?

It is something of a catch 22 situation. Until many people are using a standard it has little practical value, but if it is expensive to use the early adopters face the risk that they become the only adopters of a failed standard.

In the case of Z39.50, the rewards were worth the risk. It is now widely used in the library domain. It is easy to see, though, that taking this approach to Library 2.0 would take many, many years and, considering the rapid pace of change, would be very risky. There is a real danger that standards would be out of date before they were even implemented.

#### **RSS**

RSS, on the other hand, is a very simple standard. It is based on XML and web standards and therefore allows machine-based content syndication.

An RSS feed can be as simple as an XML web document, delivered by any web server and able to be viewed immediately in any browser, or via a very simple web or client application.

An RSS feed or RSS client can also be created in a few hours by novice developers or advanced users. The cost of creating and deploying RSS feeds and clients is therefore very low. No major investment is required and individuals can easily build useful RSS feeds and clients without the need for commercial return on investment.

#### **The advantages of simple, web-based standards**

It's not difficult to see, then, that simple web based standards are preferable. By virtue of the existing web infrastructure, combined with the simplicity of the standard, a large number of adopters can start to evaluate the standard at low cost and risk. It therefore becomes

apparent very quickly whether a large number of people will adopt and use the standard - or not. A great example of this in the library domain was the initial OpenURL standard. This took only a few years to change an important part of the industry and created an entire new business space for link resolvers.

The bottom line is that the adoption of a standard will prove impractical if only a small number of very highly skilled library domain developers can understand it. Standards must therefore be simple and accessible to a wide audience.

### **Combined standards**

For some, the idea of using a simple standard to deal with complex issues will seem incomprehensible. So it's worth remembering that the World Wide Web is based on the combination of three very simple standards: HTTP, HTML and URL.

These three standards are a perfect example of the huge value that combining simple standards can offer. Complex problems are better addressed by a number of simple and powerful standards used together than by a single highly complex standard as each simple standard provides its own immediate benefits and, when combined with others, can solve complex problems.

### **Dynamic standards**

Deliberation about standards over a number of years is simply not possible in the dynamic, 'connected' world. The web has shown us that standards can be created and in use extremely quickly. Fast and efficient standardisation is not a trick the library domain has learnt yet, but it must if it wants to survive.

Fortunately, as it becomes apparent that creating open library standards is possible the perceived risk of doing so will fall very quickly.

## 4. Project Maya

Project Maya is as Talis research project dedicated to driving a new wave of web standards into the library domain. We are doing this through collaboration with other vendors, via the Talis Connexions and Talis Additions partnership programmes, as well as by working with the wider developer and user community through the Talis Developer Network. We are also closely involved with global standards bodies through our co-chairing of the NISO web services working group and our W3C standards editorial work. Talis believes that there should be a unified set of simple web standards to access data in an ILS, to harvest holdings for example, and to access ILS functionality. In effect, breaking down the walls of the ILS silo with simple low barrier standards.

### **What next? The Skywalk platform and Project Maya**

The Talis Skywalk platform brings together components, such as Talis Keystone, Talis Silkworm and Talis Bigfoot, in a loosely coupled architecture aimed at supporting libraries in the Library 2.0 world.

Project Maya will ensure that this platform will be standards aligned so that every LMS can break free of its current boundaries. With the help of our partnership programmes, we will also ensure that this innovation will be an open, industry-wide approach that encourages the inclusion of all library stakeholders.



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