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Implementing a Next Generation Library System

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Abstract

Only a few years ago most library management systems were considered stable and mature and the focus of effort by library vendors and academic libraries was on developing and implementing client facing, web scale, discovery layers. These are now ubiquitous. However the rise and rise of electronic content and the growing complexity of managing that electronic content with systems developed last century has led to the current focus on developing and implementing next generation library management systems. These new library systems are being built from the ground up, encompassing all forms of content and subsuming more recently developed products, such as link resolvers.

Implementing a new library management system is a major undertaking and not taken lightly. Curtin University Library made the decision in 2012 to implement a next generation library system - Alma from Ex Libris – and went live in February 2014.

In this paper the author reflects on the strategic thinking that informed this decision and

- explores why vendors have invested so much in the development of new systems and why libraries are taking them up,

- teases out the benefits and risks of moving to a cloud based, multi-tenanted, software as a service product that has traditionally been hosted locally,

- weighs up the advantages and disadvantages of being early or late to the game,

- considers the impact of a rapid development methodology,

- and finally reflects on the expected gain after the pain.

Curtin Library scoped a multi-year strategic initiative in 2010 to "Review the Library Management Systems and benchmark against possible alternatives in order to ensure efficiency and productivity". This initiated a sustained period of environmental scanning that included workshops with other libraries, consultation with experts in the field, presentations from vendors including but not limited to the Library's long term library vendor Ex Libris, visits to overseas development sites (Clift, 2012), reading of the literature and in-house discussions with (and presentations to) a wide group of library staff.

In the years preceding the review most library management systems were considered stable and mature but not entirely satisfactory. The dissatisfaction however was balanced against the effort of moving to another library system, which was substantial, whilst the perceived benefit was marginal given that comparable systems were largely homogenous (Breeding, 2006).

However dissatisfaction persisted with two major shortcomings in those existing library systems. The first was in client discovery, where the web OPAC was failing to compete with web discovery as epitomised by Google, and the second was in managing the growing component of

the library's collection made up of electronic content with systems that had been designed in an age of print content.

The dissatisfaction with library electronic resource management had seen the emergence of new, loosely integrated products such as OpenURL link resolvers and Electronic Resource Management (ERM) tools and whilst these would prove to be interim solutions they did address the immediate need and thus the focus of effort by library vendors and academic libraries turned towards solving the federated search and web OPAC problem. Federated search solutions had not delivered on their promise, largely due to the inherent weakness in distributing a search to multiple sources. The twin problems of searching local collections and searching combined external 'databases' required a solution. ProQuest's Summon service took an early lead in delivering such a solution to the market, though others soon followed, developing and implementing a client facing, web scale, discovery service.

These client facing discovery layers, as they have come to be called, whilst not identical have rapidly converged in functionality and are now largely homogenous. In many cases they have replaced the web OPAC and federated search products. The concept of simply searching the library's print and journal holdings has been extended to searching the library's full range of electronic and print resources, down to the article level; and indeed searching beyond the actual holdings of the library into a massive 'web scale' dataset of information.

For the library's clients the time required to find information, from discovery to possession, has been truncated by the success of these discovery layers and the increasingly online nature of the collection. Indeed the concept of 'library collection' is changing to include anything that can be accessed by the client, whether the library has acquired the item in the traditional sense or can supply on demand. An example of such just in time acquisition is the use of Patron Driven Acquisition, where an ebook is loaned or purchased on the fly, largely unknown to the client who isn't just discovering an item in the catalogue but is a participant in the selection process.

In the traditional library system the web OPAC was an outgrowth of the underlying library system, late come to the party and manifestly inadequate despite much vendor effort and demands from libraries as wryly noted by Roy Tennant "After all, you can put lipstick on a pig, but it's still very much a pig" (Tenant, 2005). In the process of developing discovery layers that were a new product and not just putting lipstick on the pig, discovery had been decoupled from the traditional library system management. The manifest client advantages of discovery layers such as a single starting point, the ability to search beyond the library collection and the truncation of the time between discovery and acquiring have driven the discovery layer into becoming a ubiquitous part of academic libraries (Breeding, 2012) but decoupled from the traditional library management system.

While great strides were being made in discovery the rise and rise of electronic content and the growing complexity of managing that electronic content with systems developed last century and the not particularly successful interim solutions inevitably returned attention to solving the resource management problem. The architectural shift of separating discovery from resource management had also provided vendors some space in which to focus their attention on management as a discrete problem from discovery.

Library automation had been born out of the need to manage growing collections of books and the complexities of serials. However the growth of electronic content has overtaken print at all levels and patching the old management systems could only go so far.

Unlike the Open URL resolvers which had been spectacularly successful at addressing the appropriate copy problem for clients (Yi, 2007) they and ERM solutions had been much less successful (Kerr, 2010) in attempting to fill the gap left by library systems in managing the complexity of electronic content.

The traditional library management system was built to service specific needs of the time and those needs were around the acquisition, cataloguing, and circulation of print books and serials but the needs have changed. While the new interim products were successful to a degree they

were not well integrated into the library management system which remained the workhorse of the suite of library systems (Breeding, 2010). The lack of integration diminished their effectiveness and magnified the workload as library staff had to manage and communicate between separate systems often resorting to manual workflows and a multitude of spreadsheets.

What was needed was a new integrated solution, a next generation library system. One that was designed from the ground up for the electronic age and in which those areas that had developed outside the traditional library system could be brought within the core of the new system and not bolted on to outside.

Curtin Library's analysis of the library systems environment confirmed that there was movement amongst the library automation vendors and that there were some emerging solutions. The already mentioned separation of discovery from management was one that was well established but was still playing out as discovery layers jostled for market position, especially with the inclusion of mega-collections of materials.

What would a next generation library system look like? Curtin Library's analysis of the library systems environment indicated that next generation of library systems would be built from the ground up, designed for an electronic environment and provided as Software as a Service (SaaS).

A next generation library system was likely to be built from the ground up and could thus be designed to encompassing print, electronic and digital resources but with an emphasis on addressing electronic resource management which was the major unsolved problem. In this process the more recently developed external products such as OpenURL link resolvers and ERMs could be brought back into the core system. Selection workflows, data analytics, integration with external data collections and external systems such as finance could be greatly improved in the process.

A next generation library system was likely to be developed using an agile development methodology where software is developed in smaller modules that are then released to the client rather than building a monolithic product that is only released to the client very late in the development process. This agile methodology is now well understood and widely adopted for software development. The advantage of using an agile methodology when building a product of the complexity of a library system is the constant cycle of feedback from the client and the release of a working product much, much earlier in the development. The use of an agile methodology would also future proof the library system allowing it to naturally grow and develop in response to the market experience and external changes in information management.

A next generation library system was likely to be take advantage of a SaaS model where a single instance of the product is provided to multiple customers on a subscription basis.

There are economies that come from managing a single version of a product. This is particularly an advantage to the vendor for whom support costs are reduced and the efficiencies gained allow the vendor to offer a better price to customers. Another advantage for both vendor and customer is the locating of the SaaS in a data centre managed by the vendor. The infrastructure cost is transferred to the vendor and whilst passed back to the customer the actual cost should be much less than the total cost of doing the server and software management in-house. In a competitive market the overall cost to the customer should be less and the service should be at least as good as provided in-house. SaaS has become the standard model across a number of market sectors and library vendors are not breaking new ground in this regard.

The other notable change that comes with SaaS is the use of a subscription model rather than the traditional purchase and maintenance model. This relieves the customer from finding a substantial upfront capital expenditure (with a much smaller maintenance and support fee) and spreads the cost over the years of the subscription, say 3 or 5 years. Typically this will be recurrent rather than capital expenditure and with the transfer of server and database infrastructure responsibilities from the customer to the vendor local capital expenditure can be

substantially reduced. For the vendor this also means the revenue aligns with the capital outlay. Rather than putting in the capital expenditure upfront in an inflexible way, the capital goes in to match the service and if the service required grows or shrinks, for instance the amount of data storage or computing power required, then the capital expenditure can grow or shrink. Naturally the initial investment is the most difficult but growth can then be aligned with income and the company can be less exposed to change and more able to bring new customers on board quickly. This aligns with the goal of growing the customer base to take advantage of the efficiencies of the SaaS and being competitive on quality and price.

Curtin Library's extensive analysis indicated that these next generation library systems were in the pipeline and a choice was there to be made. In late 2011 three alternative strategies emerged from the analysis that could be adopted by Curtin Library in regards to the next generation of library systems.

Curtin Library could choose to do nothing in the medium term. The existing library systems were stable and capable and the library could wait until the next generation library systems had established themselves in the market before deciding if and when to make a change. This would be a low risk, low effort strategy, though there would be a risk of losing potential productivity and efficiency gains and having to work harder to catch up. The library might eventually be forced to adopt a next generation library system when the current systems were no longer supported. This would be a conservative approach.

The library could however choose to be an early adopter of one of the emerging next generation library systems. Going early would likely bring some financial benefits and potential influence over the development of the product before it reached maturity. Early adoption would align with Curtin Library's culture of innovation. However going early would mean choosing from products that were still in development and would be a higher risk strategy if the wrong choice was made. Balancing the risk against the benefit is difficult when the product is still in development and decisions are based on potential rather than actual product.

The third option was for the library to choose to implement a next generation library system in the medium term, within 3 years, but wait until the new products had reached implementation stage before making a choice. This would position Curtin Library at the earlier end of the change cycle but not at the leading edge. The choice of a next generation library system was one that the library would have to live with for 10-15 years and required careful consideration. However this last strategy would mean actively working towards a decision within the next 12-18 months and preparing the ground work for an eventual implementation.

Curtin Library chose the last strategy, to go to a new system in the medium term but not at the bleeding edge. This choice balanced the need to address the shortcomings of our existing systems whilst delaying the decision making until a more informed choice of next generation library system could be made.

Over the twelve months to the end of 2012 it became clear that the emerging next generation library system from Ex Libris, to be called Alma, was being successfully developed and would be deployed into the market. There were over 60 institutions on three continents committed to implementing Alma at that time and the first of the Australian implementations was underway but not complete. Given Curtin Library's long relationship with Ex Libris and the advantages of migrating 'within house' the decision was made that Alma would the library's next generation system.

Curtin Library went live in February 2014 after an intensive five month implementation. Curtin Library was the tenth site to go live in Australia and New Zealand and that was the culmination of a long journey that started in 2010.

However going live with a new system, whilst a significant milestone and a notable achievement is not the end of the journey but the beginning. At the time of writing this paper Curtin Library

has been live on Alma for less than two months. The library expects to spend the next twelve months settling in the new system, consolidating staff understanding of the way the new system works and exploiting new functionality such as selection workflows.

There have been immediate and obvious gains from implementing a new SaaS system. Three locally hosted and managed products have been replaced by one product that is managed by the vendor with a resultant shifting of workload. The new product's pace of development is already noticeable. There have been monthly releases applied to the software, done at a time of least inconvenience to our clients – the early hours of Sunday morning – and without intervention from library staff. The focus of library staff has shifted from testing of service packs to understanding and taking advantage of new functionality and problem fixes. Staff are adjusting to the fact that in the new system change is the new constant.

The library staff are now working in a common environment where previously much of the activity was in silos, though no one person is master of the whole system. There is an implied intuitiveness that comes from working in the same system which will ease the transition for staff as they move from one role to another.

There have been immediate benefits in the handling of electronic resources, particularly in working with publishers and other vendors. Further efficiencies in the management of resources will emerge over time, once library staff have adapted to the new way of doing things in Alma and have implemented more efficient workflows. This will be one of the goals for the first 12 months after implementation. In the first few months there will be many cases of taking a step backwards before going forward as staff adjust to a new way of doing things and then optimise workflows for local conditions.

The SaaS nature of the product and the ongoing rapid development means that all customers are on the same version at the exact same time and everyone is relatively new to the product. This has encouraged the growth of a vibrant user community. If one customer is having an issue with the latest update it is likely all customers are having the same issue, unlike being on different versions at different times resulting in vendor efforts being diluted. There is also a clear advantage in speaking to the vendor with a more unified voice and providing more coherent and timely feedback to the vendor. The roll out of next generation library systems to so many customers in such a short period of time presents a once in a generation opportunity to build a global community of disparate libraries.

For Curtin Library there were also advantages to the long lead time and the broad staff engagement in the analysis and preparation before implementation. By the time the decision was made to commit to a particular product and an implementation timeframe library staff had accepted the need for change and that the Library was moving forward with an innovative product. Staff enthusiasm and willingness to work with the new product ameliorated the inevitable hiccups and minor failings contributing greatly to the successful implementation.

Libraries continue to be collection managers and providers of information resources to their clients. Libraries have been early adopters of technologies that assist in that mission and the emergence of next generation library systems is another chapter in that proud history of technological innovation.

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