ICT as core business:
will we prosper or drown?

Carolyn McDonald
Technology Services Librarian
Gold Coast City Council
camcdonald@goldcoast.qld.gov.au

Kate Davis
Online Futures Librarian
Gold Coast City Council

Abstract
Recent changes in IT organisations have resulted in changes to library IT support. Concurrently, new tools and systems for service delivery, have become available, but these require a move away from the traditional ICT model. Many libraries are investigating new models, including Software as a Service (SaaS), cloud computing and open source software. This paper considers whether the adoption of these tools and environments by libraries has occurred as a result of a lack of suitable ICT solutions and support ICT organisations. It also considers what skills library staff need in order to ensure sustainability, supportability, and ultimately, success.

Introduction

Every day, libraries deliver Information and Communication Technology (ICT) services to their customers, in the form of public access computers, wireless Internet connectivity and technology training programs. A visit to almost any library would demonstrate that librarians increasingly rely on the Internet and the World Wide Web as a core service and collection delivery channel. And ICT is the single most important set of tools in allowing us to carry out 'traditional' library functions such as collection management and circulation. The use of ICT in libraries is now deeply entrenched.

For many libraries, ICT is no longer simply an enabler. It is increasingly becoming core business. The online world is increasingly important as a source of information and for connecting people and organisations in many spheres of life. The evidence is in every public library which has banks of computers available for members of the public to use, training courses for them to take to learn how, and staff being trained to assist them in their online journeys of discovery and connection. This means the relationship between libraries and the ICT infrastructure and support providers is more important than ever. Without appropriate ICT support, libraries will struggle to be nimble and agile in evaluating and implementing new technologies.

Libraries are surrounded by tools and systems that provide new and exciting options for service delivery, but that require a move away from the traditional ICT model. Many libraries are adopting, or at least investigating new models, including Software as a Service (SaaS) options for major systems, cloud computing for hosting of services and resources, and open source systems and software solutions.

How does this fit within the broader ICT framework of parent organisations? Why is it that libraries are increasingly choosing to embrace alternative hosting models and open source systems in preference to proprietary products? Is it because libraries' needs cannot be met by their ICT providers? Are libraries embracing these new models to fill a gap, or is there a strategic imperative to do so?

This paper investigates the ICT models that are currently in place in libraries, and how well these models meet the libraries' ICT needs. It identifies some themes that impact on libraries' decisions with regard to hosting models and draws out the implications of these. Finally, the paper presents a view of the skill set that library staff believe they need in order to manage systems and services that sit outside the traditional ICT framework. The information in this paper is based on a survey conducted by the authors in October 2009.

Definition of key terms
Some of the terms and acronyms used in this paper and the survey are used in various ways in discussion and commentary. The definitions the authors have chosen to adopt for the purposes of this paper are:

Software as a Service (SaaS)
"SaaS is software owned, delivered and managed remotely by one or more providers… [It] is purchased on a pay-for-use basis or as a subscription based on usage metrics". (Gartner 2009a p.4)

SaaS is increasingly being used interchangeably with the term cloud computing. For the purpose of this study, SaaS is used to refer to services provided under formal, usually contractual, arrangements, while cloud computing is considered to be the use of free or for-fee cloud-based services.

Cloud computing
Cloud computing is Internet ("cloud-") based development and use of computer technology. In concept, it is a paradigm shift whereby details are abstracted from the users who no longer need knowledge of, expertise in, or control over the technology infrastructure that exists "in the cloud" to support them. It typically involves the provision of dynamically scalable and often virtualized resources as a service over the Internet.

Typical cloud computing providers deliver common business applications online, which are accessed from a web browser, while the software and data are stored on the servers. (Wikipedia n.d.)

Open Source Software (OSS)
Open source describes a broad, general type of software license that makes source code available to the general public with relaxed or non-existent copyright restrictions. (Wikipedia n.d.) (For further information see Open Source Initiative, n.d.)

History

This paper does not aim to present a history of library automation as this work has already been done. (Breeding 2009b; Groenewegen 2004; Henderson 2008; Pace 2009) What is missing from the literature is a timeline that correlates developments in library automation with trends in ICT management more generally (although Breeding does explore this to some extent). (Breeding 2009b) This timeline is necessary background for this research, which aims to seek out the source of what the authors perceive as a disconnect between libraries and their support providers in terms of the provision of ICT, and some discussion of it is provided below.

During the late 1980s and early 1990s, libraries began to invest heavily in technology. Integrated library management systems created by a few large vendors emerged, representing a shift in process management. There was an increasing investment in desktop computers for library staff, and there were a few public access machines becoming available for online searching of databases. The databases were largely hosted locally, although the first Internet based resources were becoming available.

At the same time, ICT support was starting to become decentralised, at least within some universities in Australia, as desktop computers and local programs that ran on them spread across campuses. At Murdoch University in 1994, the library appointed a Library Systems Officer. This was the first IT based position outside the University's Computing Centre, but was soon followed by others across the campus. There was little central control or standardisation. Libraries generally were able to run their own systems and web servers, as more centralised, controlled web

environments were yet to become significant. In university libraries, library based email systems were common, and ICT staff in libraries managed servers, networks, desktop computers, standards (if there were any), installations, and planning. There may have been some consultation with central university ICT staff, but often decisions were made in the library and systems were funded by the library.

The Y2K (Wikipedia n.d.) burst of expenditure on ICT systems and the retirement of many legacy systems was followed by the dotcom bubble burst in the early 2000s.(Wikipedia n.d.) The introduction of service frameworks for ICT such as Information Technology Infrastructure Library (ITIL) (Office of Government Commerce (UK) n.d.) grew out of the need to control ICT expenditure, while meeting the ever growing demand for improved and expanded services. ICT organisations as well as ICT companies were forced to rationalise, and industry and governments moved towards centralised or shared services. (Claps & Di Maio 2009; Gerson 2004; Kost 2006; Kost 2008; Lan 2009; Venkatraman 2009)

At some universities, such as Murdoch University, the ICT staff were centralised. The main driver was cost reduction, but there was also a growing recognition of the value of standardisation, both for maximising procurement and staffing savings, and to maximise service levels. In some universities, such as Melbourne University, the library and the ICT group were merged into one unit. (Bridgeland & Hayes 2001; Lan 2009)

Many government departments, at all levels of government, were also moving towards shared services. (Kost 2008) Commonly, the first targets for shared services were human resources, financial systems and procurement, and ICT. It was recognised that gains could be made by centralising the systems and infrastructure that were common to everyone. Today, a shared service or centralisation program is underway in some form in every state in Australia, (for example the creation of the Office of Shared Services in Western Australia (http://www.oss.wa.gov.au) and the Library Link Victoria (http://www.publiclibrariesvictoria.net.au/node/17) project). The recent Council amalgamations in Queensland are another form of rationalisation and sharing of systems and services.

The result of these trends was that many libraries lost their dedicated, library-savvy ICT staff to the wider organisation, and had to compete for staff time and skills with other areas of the parent organisation. In many cases, the ability for clear communication between the ICT organisation and the library was reduced or lost. Schneider reminds us we need to manage that communication carefully. (Schneider 2007)

Shared or centralised services in ICT have not been easy to implement. (Kost 2008; Kost 2006; Claps & Di Maio 2009) They are often based on the standard corporate systems and infrastructure with a focus on security, standardisation, and commonality. For many ICT organisations, this leaves few resources to cater for specialist groups with unique requirements, such as libraries. The library's demands, especially where they relate to facilities for customers which are not members of the parent body (such as in public libraries) are often a challenge to the secure, controlled environment required by corporate parts of the parent organisation.

Resources to address these conflicts are often unavailable in a time of declining ICT budgets.

At the same time, ITIL is increasingly being adopted within ICT units in Australia. This framework provides a common language and set of processes for all staff working within ICT, and has led to the implementation of centralised service desks and tools to manage equipment and software across large organisations. Library staff are often not familiar with this framework, and in many cases don't understand the processes that this requires of the ICT staff.

Concurrently, Web 2.0 redefined the web, and more recently cloud computing and SaaS have emerged as formidable trends. In 2001, the move towards a user-centric web commenced, with the launch of Wikipedia providing a highly visible example and, one that was of immediate interest to librarians. By 2004, when the term Web 2.0 was coined, the move to shared services and, in some organisations, the reduction in or removal of library specialist ICT staff had taken place. Similarly, the late 2000s have heralded a growth in the uptake of open source systems in libraries (Balnaves 2008; Breeding 2008; Breeding 2009; Breeding 2009; Grant 2008; Krichel 2008; Trappler 2009; 2009). The availability of the new 'Web 2.0' tools, which apparently did not require specialist ICT skills and were available in the cloud, was a new frontier, as was the availability of 'free' alternatives to proprietary software and systems. Librarians wanted to investigate and possibly implement the new tools, but many had no local environment and possibly minimal skills available to support local implementation.

Research methodology

This research included both a literature search and a survey. The survey is included in Appendix C. The methodology, sample size and limitations of the survey are discussed in Appendix A.

The majority of analysis in this paper results from quantitative analysis of the data collected via the survey. Some broad themes have been identified from this quantitative analysis, as well as manual analysis of the comments. Full keyword analysis of the data has not been undertaken at this stage.

Survey results

The detailed discussion of the data from the survey is presented in Appendix B, due to lack of space in the main paper.

Themes from the data

The drive to move to SaaS and the cloud

SaaS and cloud-based solutions are perceived to be cost effective

For the core library system that facilitates library business, the LMS, 54% of respondents who indicated a SaaS option was in place cited cost effectiveness as a reason for selection of this model. Indeed, cost effectiveness was an often-cited reason for selection of SaaS and cloud-based solutions across the various system types.

The Gartner Group supports the idea that SaaS solutions can potentially "save time, cost and resources over the traditional approach of deploying packaged applications for automating functions supporting prospects, customers, internal staff and partners" (Gartner 2009a p 4).

Lack of local support for Web 2.0 applications and services often coincides with use of SaaS or cloud-based solutions for blogs and wikis

Of the respondents who indicated the support providers did not provide support for Web 2.0 applications and services, only 20% indicated that blogs were hosted locally (either by the library or by a non library ICT support group), with 80% indicating that they use cloud-based hosting options (either for fee or free). Comparatively, respondents who indicated that their support providers supported Web 2.0 applications and services were more likely to use local hosting options for blogs, with 56.4% of this group indicating blogging software was hosted locally (either by the library or by a non library ICT support group). 33% of this group reported use of cloud-based or SaaS solutions for blogging software.

Respondents' indication of hosting options for wiki software demonstrate a similar trend. 63.9% of respondents who indicated their support providers support Web 2.0 applications and services also indicated that wiki software is hosted internally (either by the library or by a non-library ICT group). 25% of the same group indicated that wiki software was hosted externally, either in the cloud or as a SaaS solution. Comparatively, only 32% of respondents who indicated that their support providers do not support Web 2.0 reported that wiki software is hosted locally, while 68% of the same group indicated that wiki software is hosted in the cloud (either for fee or free).

Similarly, of those respondents who indicated wikis and/or blogs were provided via cloud or SaaS solutions, 25% or greater of respondents indicated that the parent ICT organisation was unable or unwilling to provide a local solution.

SaaS and the cloud to bypass the local IT group

Throughout the data, there is a strong sense that SaaS and cloud-based solutions were, in a number of cases, implemented to 'get around' the local IT group, whether because the group was unable to provide a solution, is unsupportive of 2.0 initiatives, does not have the necessary skills, is overly security-focused, is inefficient, or simply does not understand library business.

- o *Using a SAAS [sic] model has eliminated problems we were having with replacing servers on a timely basis.*

- o *The ILS was moved to SaaS because local hardware people were unwilling to support Solaris. Nor could we get permission to upgrade Sun servers, because Sun was not on the approved vendor list.*

- o *We are moving to the cloud and using open source software in order to bypass the ICT Dept.*

These sentiments are echoed by the data around hosting options, with strong representation for the reasons.

  o *Parent ICT organisation unable/unwilling to provide local solution and Eliminated / reduced red tape - implementation easier.*

Gartner notes that "[d]espite its promise, SaaS is not a panacea for the complex people and process issues in most organizations" and notes that the "best adoption path will be deliberate use of SaaS, initially for narrow processes where the technology and vendor capabilities are good matches" (Gartner 2009a p. 4-5).

The authors' research suggests that in some cases, the perception is that SaaS and cloud-based solutions are a viable stop-gap, perhaps even the panacea that Gartner tells us is not offered by SaaS. Further research is necessary to determine whether libraries are moving services to the cloud as part of a strategic imperative to do so, or because they are looking for back doors to get things done.

The parent organisation's ICT infrastructure may not be appropriate to support library business

With almost 80% of respondents belonging to libraries that are part of a larger organisation, it is unsurprising that the issue of suitability of the parent organisation's ICT infrastructure for delivery of library business arose as a theme. Indeed, a number of respondents questioned whether the parent organisation's infrastructure was suited to library business:

  o *I think that one of the factors not considered in this survey but in my mind is fundamentally important to what type of ICT service the library has/offers is who controls the network infrastructure and is it built to reflect the needs of the library or the parent organisation? If library staff upload photos to Flickr and twitter about it - and the public PCs are blocked access to these types of sites via firewall/Internet policy of the organisation - who is their audience/who are they reaching? just themselves?*

  o *[T]he very different nature of ICT for a corporate environment and a public one creates a tension.*

  o *Fundamental clash between security-focussed closed organization policy and library's greater requirement for openness.*

  o *We are supposed to fit into a pre-defined box created by our parent org. and our ILS vendor. Very hard to work this way.*

Indeed, the very fact that respondents indicated they used SaaS and/or cloud solutions to 'get around' corporate ICT groups supports the contention that the parent organisation's infrastructure may not be appropriate for the library environment. As mentioned previously, many respondents reported mixed models for provision of ICT infrastructure and environment, management and administration of systems, and support for ICT. It would be interesting to explore the extent to which unsuitability of the parent organisation's ICT for provision of library services has impacted on the development of the rather fragmented, mixed modality ICT management and support frameworks that exist in many libraries.

Control is a key concept

The desire for the library to gain greater control over systems was a frequently cited reason for implementation of SaaS and cloud solutions.

Discussion around the relationship between library staff and the ICT support group as well as around parent organisation's ICT policy and processes, indicates that control is a critical factor in the way business is conducted. There is a sense that, in a number of cases, the parent organisation's approach to ICT management, is, as one respondent eloquently expressed it, one of 'control freakery'.

- o *… it still seems to be a battle everytime [sic] we have to request something. They take decisions out of our hands… we are left with unsatisfactory outcome with little or no justifications.*

- o *The approvals process puts an individual without understanding of library needs or possibilities [in control] and insists on strict application of policies that may be counterproductive.*

- o *Lots of passive-aggressive politics, with additional control freakery.*

Relationships with ICT groups need work

A significant proportion of respondents indicated a less-than-perfect relationship with the ICT support and infrastructure group
23.2% of respondents indicated the relationship with the group that provides ICT support and/or infrastructure is unhealthy. For the purposes of the survey, 'unhealthy' was defined as: "Communication channels are not effective. Either the library or the ICT group / outsourcing partner does not understand the needs of the other party (or both). Realisation of desired outcomes is severely impacted." This is a significant number of respondents and is certainly an area of concern.

A further 61.6% of respondents indicated the relationship with the group that provides ICT support and/or infrastructure is mostly healthy. For the purposes of the survey, 'mostly healthy' was defined as: "Communication is usually free-flowing, could be improved. Both the library and the ICT group / outsourcing partner generally understand each other's needs, however there are some gaps in understanding that impact on realisation of desired outcomes from time-to-time."

In essence, in significantly more than three-quarters (84.8%) of responses, there is an imperative for the relationship between the ICT group and the library to be improved. It goes without saying that a healthy relationship between the library and the ICT group is fundamentally important to libraries' success in an environment where ICT is core business.

Perception of ICT management may be poor
In addition to less-than-perfect relationships between libraries and ICT groups, there is also an indication in the data that perception of ICT management is fairly poor, even when the frontline ICT staff are well thought of.

- o *…the wider ICT group (particularly ICT managers) does not communicate well with library staff.*

- *We try hard and communicate will [sic] with those who provide the frontline services but IT management do not communicate well.*

Library support providers and parent organisation support providers are perceived quite differently

A number of respondents who commented on the question that asked them to rate statements about their ICT support group indicated that they found the question difficult to answer, as they have two or more support groups: library staff, and the parent organisation's ICT group (and/or, in some cases, an external provider). This difficulty, while caused by an acknowledged flaw in the survey design, did elicit an interesting theme. Among the comments regarding difficulty with this question, a common theme was that there was a marked difference in approach by the different support providers, and, in fact, that the library support staff would garner more positive responses than the parent organisation's ICT group. For example:

- *Can't answer accutately [sic] – some of the people and organisations which provide support are on opposite ends of the spectrum for some of these statements.*

- *Library staff are excellent and responsive to changing needs. Parent organisation is the opposite and gets bogged down in bureaucracy.*

- *I have answered this in relation to Council support. Library staff support and Civica support are very different.*

- *The IT guys at our school are psychotic idiots. None of this applies to the LibLime staff.*

- *This was difficult to answer as I feel the answers differ between the parent IT dept support and library support.*

- *Answered the above questions in terms of parent org's IT staff, not staff in library, who are doing the best they can within the technological constraints of the parent org's IT infrastructure.*

- *The answers are almost [di]ametrically opposite depending on whether the focus is Library staff support for IT or the IT depts [sic] support for IT.*

ICT skills for library staff

Role differentiation: content production vs system administration

In developing the survey, the authors were conscious that there are two quite different types of roles that are played in libraries with regard to use of ICT: that of content production and service management, and that of a more traditional systems role. This division is one that does not seem to make itself apparent in the literature: there is a general feeling of 'DIYness' around libraries' use of social media, cloud computing applications and other emerging technology. Indeed, the authors suspected this division might result in some confusion for survey participants, and this is probably reflected in a low completion rate; one potential respondent indicated in conversation with one of the authors that they tried to complete the survey but "didn't know any of the answers".

The service ownership vs system administration divide was highlighted by a respondent, who made this comment:

> *I think you need dedicated IT professionals, who may or may not have library qualifications/experience, to support library ICT systems. The IT professionals obviously should have the necessary skill sets for whatever their role is AND just as importantly be dedicated to providing the LIBRARY (not Council or parent group) IT service. Supporting the systems is completely separate role to content creation role eg You pay an IT professional to create and administer the website AND you pay someone else (ie library non-IT staff) to write the blogs. I think its pointless trying to find people who can do both at a professional level - they are few and far between.*

While the authors essentially disagree with such a black and white divide, it is true that there are two distinct types of roles in managing implementation and ongoing maintenance of services that make use of emerging technology. As the comment above indicates, some people see this divide being around professional IT qualifications. That is, content production and service management is done by library staff; systems administration is done by IT staff. Who pays the latter group is a moot point. The emphasis is on IT know-how.

But is this actually what happens in practice? More and more librarians are rolling up their sleeves and experimenting with the types of activities that we would have traditionally left to IT staff. For example, in a library where the parent organisation manages ICT, a desire to setup a new website would likely be escalated through ICT processes, with responsibility for design and development sitting with the corporate web team. Does this hold true if the library wishes to setup a blog, or does the fact that setup is apparently so easy mean that librarians are actually doing the work themselves? What happens when they need to do something that goes beyond what a WYSIWYG editor can do? Take another example: the library wishes to use a database of some sort to house selected links to freely available websites and wants to serve these up dynamically in a HTML page. In the past, we would have gone to the parent organisation's development staff for a solution. Today, we can create a delicious account, convert the RSS feed for a tag or a combination of tags to JavaScript, and copy and paste that code into the HTML page. We pick and choose from emerging technologies to build the service infrastructure we need, choosing whatever option best fits our needs (or whatever option we can massage into the appropriate shape to fit the need) that we can implement with our current skills. But is this the best approach? It certainly results in further fragmentation of our service models and, in some cases, means we select a tool because it fits our limited skills sets, rather than because it best fits the need.

The issue is not a clear cut one: it's certainly not a case of shaving off the true 'IT' components of our work and handing those back to the ICT support providers, because, as this survey has evidenced, this will not likely result in the outcomes we need. Rather, the solution probably revolves around librarians building technical skills.

Partridge (2009) describes a divide highlighted by her research: "IT skills" versus "IT appreciation skills". This could be an effective way to think about the divide between

the true "IT" work and content production and service management. Partridge's preliminary work around skills and knowledge for Librarian 2.0 has identified eight key issues, the first of which relates to Technology. "The successful librarian in the web 2.0 world (and beyond) needs to be aware of, and have some fundamental understanding of, the emerging technology – what is available and what it can do and how to make it do what is needed – but they do not need to be IT professionals per se." (Partridge 2009 p8) This is probably true of a majority of librarians, however, if there is a group of librarians that are positioning themselves to exploit emerging technology, to opt for cloud-based solutions, and to implement OSS (and there certainly is such a group), then it is undeniable that those librarians need a skill set that goes beyond "IT appreciation".

David Stuart recently wrote an interesting article on programming skills for librarians that tackled the issue of what sort of IT skills librarians might need. He said:

> The skill sets of librarians and computer programmers are very different and it would undoubtedly be an inefficient use of resources to train librarians to a professional standard of programming. Programming languages go in and out of fashion, and new platforms regularly emerge, requiring their own scripting languages. However, a basic level of programming and experience of manipulating and combining together some of the data available will provide librarians with a better understanding of the potential opportunities with the available data. At a minimum it should be expected that librarians have experience of some of the available mashup tools and editors, and are aware of the scope of the data available. (Stuart, 2009)

Programming, development and system administration skills for librarians is an enormous issue that needs considerably more attention than this paper can give it. The importance of this issue was highlighted for the authors by the fact that SaaS and cloud computing are seen as ways to 'dodge' corporate ICT groups and by the fact that respondents reported some concerning issues with regard to the health of the library's relationship with the ICT support providers.

Respondents' skills

Respondent profile
129 respondents indicated they had IT qualifications or experience (57.7% of respondents who provided an answer to this question). Of those, 60 reported qualifications at varying levels – from a single unit in a library and information science course, to undergraduate and postgraduate qualifications in IT.

Fittingly, respondents who reported they work in systems support roles were more likely to have IT qualifications or experience than respondents who occupy customer service, management / administration or technical services roles. However, there was still a significant proportion of respondents who work in systems support who do not have IT qualifications or experience (20% of respondents who indicate they work in systems support) (see Table 5).

Do you have any IT qualifications or experience?					
	Role				
	Management/ Administration	**Customer services**	**System support**	**Technical services**	**Other (please specify)**
Yes	66%	43%	74%	43%	19%
No	53%	43%	20%	24%	13%

Table 5: IT qualifications and experience by role type

What constitutes 'IT skills'?
As mentioned in Appendix B, there was an issue with the wording of the survey question that asked respondents whether they had any IT qualifications or experience. In essence, 'qualifications' and 'experience' should have been treated separately to maintain the integrity of data. Regardless, the data that emerged from this question does raise some interesting issues around the definition of 'IT skills'.

Rather alarmingly, there was a distinct theme among the respondents that a not insignificant number of respondents equated basic computer skills with IT skills. Granted, this could have, in part, been due to the wording of the question. However, there was certainly an indication from a number of respondents that the ability to use Word, Excel and PowerPoint, or experience "helping students with computer problems" counted as "IT qualifications or experience".

Undoubtedly, Web 2.0 had democratised technology and made it accessible to a much wider audience. At the same time, though, there may have been a devaluation of the work that is done by 'real' IT professionals. Interestingly, while 37.5% of respondents who indicated a SaaS solution was in place for the LMS indicated this choice was informed by a lack of staff skills to host/manage the system internally, only 8.1% of respondents gave this same reason for choice of a SaaS or cloud solution for blogging software. This could be indicative of a perception that blogs are an 'easy' technology to manage. While an LMS is undoubtedly a more complex (and more critical) system, there are similarities in system administration tasks across the two system types. Indeed, all locally managed systems have similar administrative tasks that require IT skills. Could the people that implement a blog hosted on WordPress actually manage a local install? There is a distinct difference between the ability to use push-to-publish technology and IT skills – a difference that some respondents did not recognise.

Required skills and skills gap

The survey gathered rich data on perceptions of IT skills requirements for library staff. In fact, data too rich to fit within the scope of this paper. The authors hope to undertake further work around ICT skills sets for librarians in 2010, with specific focus on that subgroup of librarians who require significantly more technical skills than the populace of "IT appreciators" may have. The data gathered as part of the research reported in this paper will form the foundations for development of the methodology for this further research.

Conclusion

Where to from here? Parent organisations and alternative ICT models

This survey has raised more questions than it answers. The frustration experienced by many respondents in realising desired outcomes with regard to technology implementation and management is clear from comments provided. It would be useful to collect quantitative data about limitations on services or delays in introduction of new technologies caused by the support arrangements where the library is not self-supporting as compared to those libraries that are self-supporting, and the associated costs.

Why does this situation exist? It is difficult to imagine that the comment from one respondent, *"The IT guys at our school are psychotic idiots"* is literally true. Schneider states that "[m]ost of us are buckling under the weight of what we have to support".(Schneider 2007)*. In the authors' experience, many ICT workers are dedicated, hard working professionals who strive to achieve good outcomes for their organisations. So why don't the support arrangements that involve parent organisations provide what the library needs? The comments in the survey reflect a number of themes:

- o poor or inadequate communication
- o bureaucracy/politics
- o demands of the parent organisation conflict with and overwhelm the needs of the library

It would seem that all of these issues could be overcome. However, many parent organisations place demands on ICT groups for tight control over security and budget, and strict lock down of access to systems and standardisation is one method of achieving this.

During a recent conversation with a Gartner consultant, (Krause 2009), one author was advised that immature ICT organisations needed to get their house in order, and gaining control over what are essentially disparate and expensive varieties of systems and environments was the first task in doing that. The ICT group is held accountable, so they are required to put safeguards and controls in place to protect their organisations. More mature ICT organisations that have this level of control are better able to assess where there are different requirements, and start to create exceptions to allow for them.

It is clear from responses to the survey that many librarians don't feel a solution is achievable, and so as one respondent said, *We are moving to the cloud and using open source software in order to bypass the ICT Dept.* This solution has risks of its own. Each library will need to assess those risks carefully and decide if they are acceptable. (Hamilton, 2009)

There is a glimmer of hope. In his recent paper, Gartner analyst Brian Prentice recommended:

> IT leaders must start investigating trends in emerging control structures, lest they remain perpetual victims of a changing environment. The easiest way to accommodate the changing environment is to recognize and act on a new set of underlying assumptions, which include the desire for greater autonomy, simplified solutions and appropriate risk mitigation frameworks. (Prentice, 2009, p.1)

He goes on to say

> The tendency of many IT organizations is to use risk management polices as proxies to re-exert control over an increasingly fragmented environment. They try to anticipate every possible form of incident, and to develop and communicate rules that attempt to prevent every possible failure – but this approach is invariably counterproductive. (Prentice, 2009, p.3)

So perhaps this indicates at least some IT groups may be ready to listen. But libraries may need to be creative and constructive to develop effective ways to communicate their requirements so that ICT colleagues and organisations understand what they needs and how important are those needs to the overall organisation.

One possible approach is to develop clear requirements for the library ICT environment at a strategic level, and include ICT management in the process of developing the requirements. The requirements should not only include systems, but architecture, infrastructure, governance arrangements, financial arrangements and most importantly, the people component.

It is important to identify what skills are required and the level of support required, but also how that support should be structured to achieve the required outcomes. It may be that a consideration is given to the organizational structure required, both within the library and within the ICT group, to leverage scarce skills. If the conversations between library and ICT groups are couched in terms of identifying what is required to achieve the organisation's outcomes as partners rather than competitors for resources, perhaps greater collaboration and mutual support can be achieved.

The imperative for further research

This paper has reported on the findings of a perceptions-based research project and drawn out a number of issues that warrant further investigation. Specifically, some of the themes outlined in the section of the same name could be investigated from a quantitative perspective, and work around IT skills for library staff is much needed. It is hoped that this paper will act as a good launching pad for further research, whether conducted by the authors or others.

While this research is insufficient to provide any definitive answers, perhaps it contains some clues that will assist libraries that are currently 'drowning' to find a path to a better solution. It may even demonstrate that for some libraries, some of the strategies discussed may enable libraries to harness ICT effectively and allow them to prosper.

Bibliography

2009a. OCLC web-based service challenges ILS vendors. *American Libraries*, 40(6/7), 38.

2009b. *The open library environment project: final report*, Available at: http://oleproject.org/wp-content/uploads/2009/11/OLE_FINAL_Report1.pdf [Accessed November 3, 2009].

The Open Source Definition. *Open Source Initiative*. Available at: http://www.opensource.org/docs/osd [Accessed November 3, 2009].

Abram, S., 2009. What is cloud computing? *Stephen's Lighthouse*. Available at: http://stephenslighthouse.sirsidynix.com/archives/2009/10/what_is_cloud_c.html [Accessed November 3, 2009].

Balnaves, E., 2008. Open source library management systems: a multidimensional evaluation. *Australian Academic & Research Libraries*, 39(1), 1-13.

Breeding, M., 2009a. An open letter to the Koha community. *Library Technology Guides*. Available at: http://www.librarytechnology.org/blog.pl?ThreadID=126 [Accessed November 3, 2009].

Breeding, M., 2009b. Moving forward through tech cycles. *Computers in Libraries*, 29(5), 19-21.

Breeding, M., 2008. Open Source Integrated Library Systems. *Library Technology Reports*, 44(8). Available at: http://www.librarytechnology.org/ltg-displaytext.pl?RC=13723 [Accessed November 3, 2009].

Breeding, M., 2009. Opening up library automation software. *Computers in Libraries*, 29(2), 25-27.

Bridgeland, A. & Hayes, H., All the Kings horses! - the creation of an integrated information structure at the University of Melbourne. In *EDUCAUSE in Australasia 2001: the power of 3*. Marriott Surfers Paradise Resort, Queensland.

Carr, N.G., 2008. *The Big Switch: Rewiring the World, from Edison to Google*, W. W. Norton & Co.

Chapman, C., 2009. The history of the internet in a nutshell. *Six Revisions*. Available at: http://sixrevisions.com/resources/the-history-of-the-in-a-nutshell/ [Accessed November 19, 2009].

Claps, M. & Di Maio, A., 2009. *How governments are addressing the IT consolidation conundrum*, Gartner. Available at: http://www.gartner.com [Accessed October 29, 2009].

Di Maio, A., 2009a. *Government in the cloud: much more than computing*, Gartner. Available at: http://www.gartner.com [Accessed November 30, 2009].

Di Maio, A., 2009b. *Andrea Di Maio: a member of the Gartner blog network.* Available at http://blogs.gartner.com/andrea_dimaio/tag/government-20/ [Accessed November 25th, 2009].

Driver, M., 2008. *Predicts 2009: The Evolving Open-Source Software Model*, Gartner. Available at: ttp://mediaproducts.gartner.com/reprints/microsoft/164057.html [Accessed November 3, 2009].

Farkas, M., 2009a. From Desktop to Cloud Top. *American Libraries*, 40(4), 27.

Farkas, M., 2009b. It's not all about the tech - why 2.0 tech fails. *Information wants to be free.* Available at: http://meredith.wolfwater.com/wordpress/2009/03/14/its-not-all-about-the-tech-why-20-tech-fails/ [Accessed October 19, 2009].

Farkas, M., 2009c. My office in the cloud. *American Libraries*, 40(5), 37.

Gartner, 2009a. *Hype cycle for software as a service,* Gartner. Available at: http://www.gartner.com [Accessed November 27, 2009]

Gartner, 2009b. *Hype cycle for web and user interaction technologies, 2009.* Available at: http://www.gartner.com [Accessed November 27, 2009]

Gartner, 2009c. *Hype cycle special report for 2009.* Available at: http://www.gartner.com [Accessed November 1, 2009]

Gatewood, B., 2009. Clouds on the information horizon: how to avoid the storm. *Information Management*, 43(4), 32-36.

Gerson, P., 2004. *Releasing resources to the front line: independent review of public sector efficiency*, Available at: http://www.hm-treasury.gov.uk [Accessed November 1, 2009].

Gordon, R.S., 2003. Overcoming the systems librarian imposter syndrome. *LIBRES*, 13(2). Available at: http://libres.curtin.edu.au/libres13n2/ [Accessed November 28, 2009].

Grant, C., 2008. Gone open yet. *Public Library Quarterly*, 27(3), 223-241.

Groenewegen, H.W., 2004. Four decades of automation: recollections and reflections. *Australian Library Journal*, 53(1), 39-54.

Hamilton, C., 2009. How to Evaluate New Applications and Services. *Web Worker Daily*. Available at: http://webworkerdaily.com/2009/08/01/how-to-evaluate-new-applications-and-services/ [Accessed November 3, 2009].

Hartig, K., 2009. What is Cloud Computing? *Cloud computing on Ulitzer*. Available at: http://cloudcomputing.ulitzer.com/node/579826 [Accessed November 3, 2009].

Hastings, R., 2009. A Cloud Computing Case Study. *Library Technology Reports*, May/June 2009, 13-15.

Hastings, R., Cloud Computing. *Library Technology Reports*, May/June 2009, 10-12.

Henderson, M., 2008. Heresy and misconduct: evolution in library automation. *ILA Reporter*, 26(3), 4-7.

Kost, J., 2006. *How to manage the consolidation of government IT infrastructure*, Gartner. Available at: http://www.gartner.com [Accessed October 29, 2009].

Kost, J., 2008. *IT consolidation in government: a checklist for success*, Gartner. Available at: http://www.gartner.com [Accessed October 29, 2009].

Krichel, T., 2008. From open source to open libraries. *Bulletin of the American Society for Information Science & Technology*, 35(2), 39-46.

Lamont, M., 2009. Gender, technology, and libraries. *Information Technology and Libraries*, 28(3), 137-142.

Lan, S., 2009. Organizational and Operational Optimization of Academic Library and Informa... *CALA Occasional Paper Series*, 2009(3), 3-11.

Mahoney, J. & Berg, J., 2006. *The period to 2012 will be years of transition for IT organizations and IT management.* Available at: http://www.gartner.com/ [Accessed October 21, 2009].

Open Source Initiative, The Open Source Definition. *Open Source Initiative.* Available at http://opensource.org/docs/osd [Accessed November 3, 2009]

Pace, A., 2009. 21st century library systems. *Journal of Library Administration*, 49(6), 641-650.

Partridge, Helen. *The skills and knowledge of librarian 2.0: preliminary findings.* Australian Learning and Teaching Council / Queensland University of Technology. Available at: http://liseducation.wordpress.com/ [Accessed October 15, 2009].

Prentice, B., 2009 *Understand and benefit from the emerging IT control environment.* Gartner. Available at: http://www.gartner.com [Accessed November 1, 2009].
Schneider, K.G., 2007. IT and Sympathy. *ALA Techsource.* Available at: http://www.alatechsource.org/blog/2007/01/it-and-sympathy.html [Accessed November 16, 2009].

Stuart, D., 2009. Programming skills could transform librarians' roles. *Information research.* Available at: http://www.researchinformation.info/features/feature.php?feature_id=245 [Accessed December 1, 2009].

Trainor, C., 2009a. The Sacred Cows of Library Technologists. *ALA Techsource.* Available at: http://www.alatechsource.org/blog/2009/11/the-sacred-cows-of-library-technologists.html [Accessed November 15, 2009].

Trainor, C., 2009b. Where the rubber meets the road... . Available at:
http://www.alatechsource.org/blog/2009/05/where-the-rubber-meets-the-road.html
[Accessed November 19, 2009].

Trappler, T.J., 2009. Is There Such a Thing as Free Software? The Pros and Cons of
Open-Source Software (EDUCAUSE Quarterly) | EDUCAUSE. *EQ: EDUCAUSE
Quarterly*, 32(2). Available at:
http://www.educause.edu/EDUCAUSE+Quarterly/EDUCAUSEQuarterlyMagazineVol
um/IsThereSuchaThingasFreeSoftwar/174575 [Accessed November 3, 2009].

Truitt, M., 2009. Editorial: Computing in the "cloud". *Information Technology &
Libraries*. Available at:
http://search.ebscohost.com/login.aspx?direct=true&db=lih&AN=43690892&site=eho
st-live [Accessed November 3, 2009].

Venkatraman, A., 2009. If you're keen, it's time to get lean. *Information World
Review*, Jul/Aug 2009(257), 16-17.

Wikipedia, Cloud computing. In *Wikipedia.* Available at :
http://en.wikipedia.org/wiki/Cloud_computing [Accessed November 28, 2009]

Wikipedia, Dot-com bubble. In *Wikipedia.* Available at :
http://en.wikipedia.org/wiki/Dot-com_bubble [Accessed November 29, 2009]

Wikipedia, Open source. In *Wikipedia.* Available at :
http://en.wikipedia.org/wiki/Open_source [Accessed November 28, 2009]

Wikipedia, Year 2000 problem. In *Wikipedia.* Available at :
http://en.wikipedia.org/wiki/Year_2000_problem [Accessed November 29, 2009]

Yee, A., 2009b. Is Cloud Computing Killing Open Source? *ebiz*. Available at:
http://www.ebizq.net/blogs/cloudtalk/2009/09/is_cloud_computing_killing_ope.php
[Accessed November 3, 2009].

Appendix A

Research methodology

Methodology

Two types of research were undertaken to inform this paper: a literature review and a survey. The literature review provided historical context for the development and uptake of cloud computing, SaaS and OSS, which was outlined in the previous section of this paper. It also provided context for the development of the survey instrument.

The survey instrument was broken up into four sections:
- o Introduction
- o Relationship between ICT group and library
- o Software and hosting models
- o Skills

The survey instrument has been provided at Appendix C.

The survey was conducted using SurveyMonkey and initially ran for a period of 12 days from 19 October to 30 October. At this point, the survey was closed; however, in the following week requests were received to reopen the survey. A number of additional responses were received on reopening. At time of writing (November 2009), the survey remains open, however, this paper has been prepared based on responses submitted up to and including 15 November 2009.

The survey was promoted virally, via the researchers' personal Twitter accounts, Facebook groups (ALIA; Library 2.0 Interest Group), one of the researchers' personal blog (virtuallyalibrarian.com), and the Libraries Interact blog (librariesinteract.info). Selected key figures in the biblioblogosphere who have a noted interest in OSS, cloud computing and SaaS in libraries were emailed the details of the survey. Some of these people opted to promote the survey via elists or Twitter. The survey was also promoted on various elists known to the researchers.

Sample size

This paper is based on survey responses submitted up to and including 15 November 2009. On this date, 236 survey responses had been received. Of these, 93 responses were completed fully (that is, with an answer to every question). Incomplete responses have not been considered to be invalid, as no questions were mandatory, and they were not necessarily interdependent.

The sample is not large enough to be considered representative and therefore there is limited benefit in extrapolating the findings. However, the research has highlighted themes that could be explored through further, more targeted research.

Limitations in the methodology

Due to time constraints, the survey instrument (see Appendix C) was not rigorously tested. This, coupled with the complexity of ICT environments in many libraries, resulted in some unforeseen complexities in responses and some limitations in terms of the ability to extrapolate (and, in the case of one question, the validity of the data). That said, the comments provided were rich and added detail that clarified responses. Beyond this paper, further research based on keyword analysis of the data would be useful and would assist in managing some of the limitations that exist as a result of survey design.

It should also be noted that the survey instrument was designed to measure perceptions, rather than to collect 'hard data' about actualities. The intent with this survey was to establish some basic themes, derived from perceptions, that could be explored through further research. Further, the impression that is gained from reading library literature (and blogs) is that many decisions around implementation of 2.0 tools in particular are not necessarily based on rigorous planning (see, for example, Farkas 2009b). Perception plays an important part in choice of tools and hosting models, and is therefore an important area for research.

In the Introduction section of the survey, respondents were asked whether they had any Information Technology (IT) skills or qualifications. Firstly, this question should have been split into two, differentiating between qualifications and experience. Secondly, a definition of the terms 'IT qualifications' and 'IT experience" should have been provided. Numerous respondents indicated they did have "IT qualifications or experiences" and provided a comment that seemed to indicate this extended only to end user computing experience. This may indicate a perception that end user computing skills or experience are adequate for the management of library technology, but it may also indicate that the question was misunderstood.

There was a further limitation in question nine in the section *Relationship between ICT group and library*, which asked participants to rate statements as they apply to the group responsible for providing the support the library receives. This question should have been broken into three parts, providing opportunities for respondents to give individual, differentiated ratings for the support provided by library staff, the parent organisation, and external providers. Some participants commented that this question was difficult to answer because the ratings differed across the different support providers. Further, it would have been useful to be able to compare the ratings across the different support providers.

To increase the sample size and ensure representativeness, it may have been wise to target institutions in promoting the survey, rather than relying solely on viral marketing. It may have also been appropriate to address the survey to management and/or technology personnel in libraries, to ensure that respondents had the frame of reference necessary to provide informed responses. While the quality of the responses was not necessarily affected by the fact that this wasn't done, there were a fairly substantial number of respondents who did not proceed past the first page of the survey.

Appendix B
Preliminary findings

Profile of respondents
Of the 236 respondents, 98.7% identified that they were currently working (or had previously worked) in a library.

88.3% of the sample indicated they were a qualified librarian or library technician.

Over half of respondents came from public and academic libraries, with public libraries being the most highly represented library type, followed by academic libraries (see Chart 1).

Library type

8.5%
8.1%
31.6%
18.8%
4.3%
3.8%
24.8%

Public
Academic
K-12
Vocational Education (TAFE)
Special
State or National
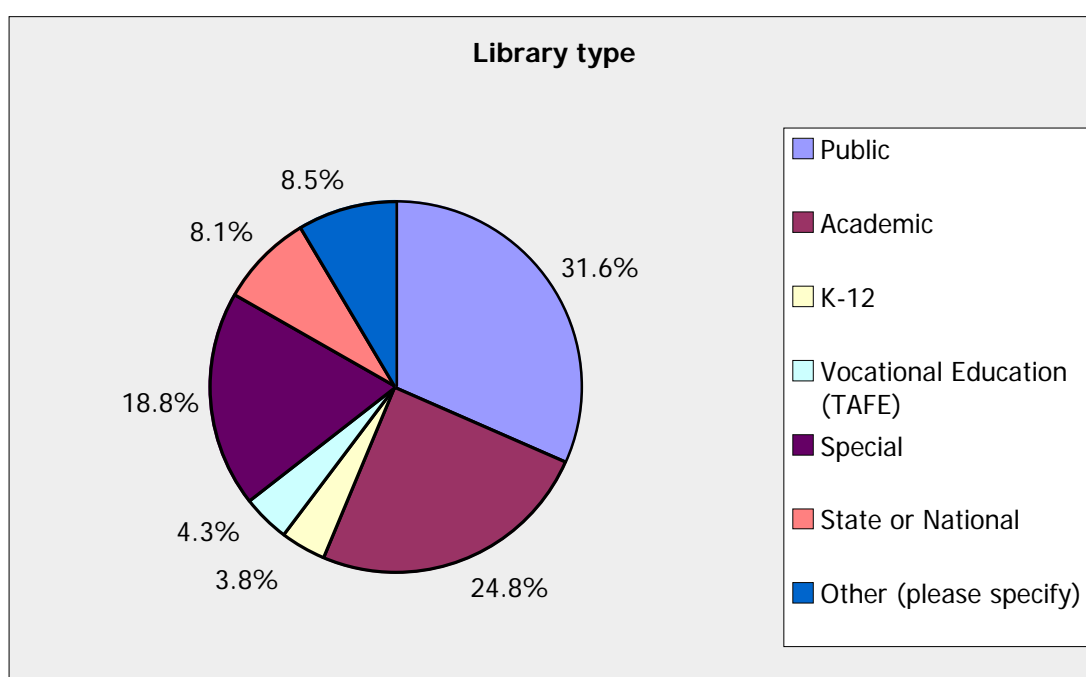Other (please specify)

Chart 1: Library type

There were no geographical restrictions on the survey. However, while the data is indicative, it is not truly representative of the international library community, as Australia and New Zealand are significantly over-represented at 68.2% (see Chart 2).
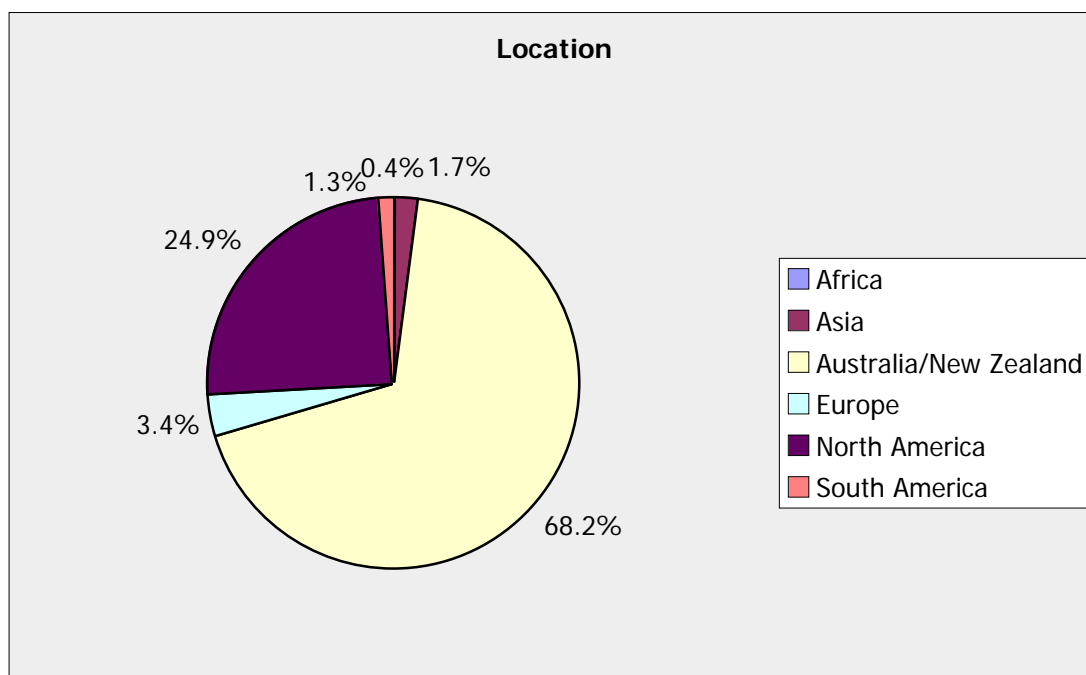
Chart 2: Location

Public libraries were the most highly represented library type in both Australia/New Zealand and North America (see Table 1).

Library type by location

Answer options	Where are you located?						Response count
	Africa	**Asia**	**Australia**	**Europe**	**North America**	**South America**	
Public	0	0	48	0	24	1	73
Academic	1	1	32	4	17	2	57
K-12	0	0	5	0	4	0	9
Vocational Education (TAFE)	0	0	9	0	1	0	10
Special	0	1	38	3	2	0	44
State or National	0	1	12	0	6	0	19
Other (please specify)	0	1	14	1	4	0	20
Total							232

Table 1: Library type by location

Respondents were asked to select from a list of terms that described their role (and were invited to select more than one option). Just over half (52.6%) of all respondents indicated their role is a management or administration one, while 41.5% of respondents indicated they occupy a system support role. 38% of respondents indicated their role had a customer service component and 30.3% identified as having a technical services role (see Chart 3).
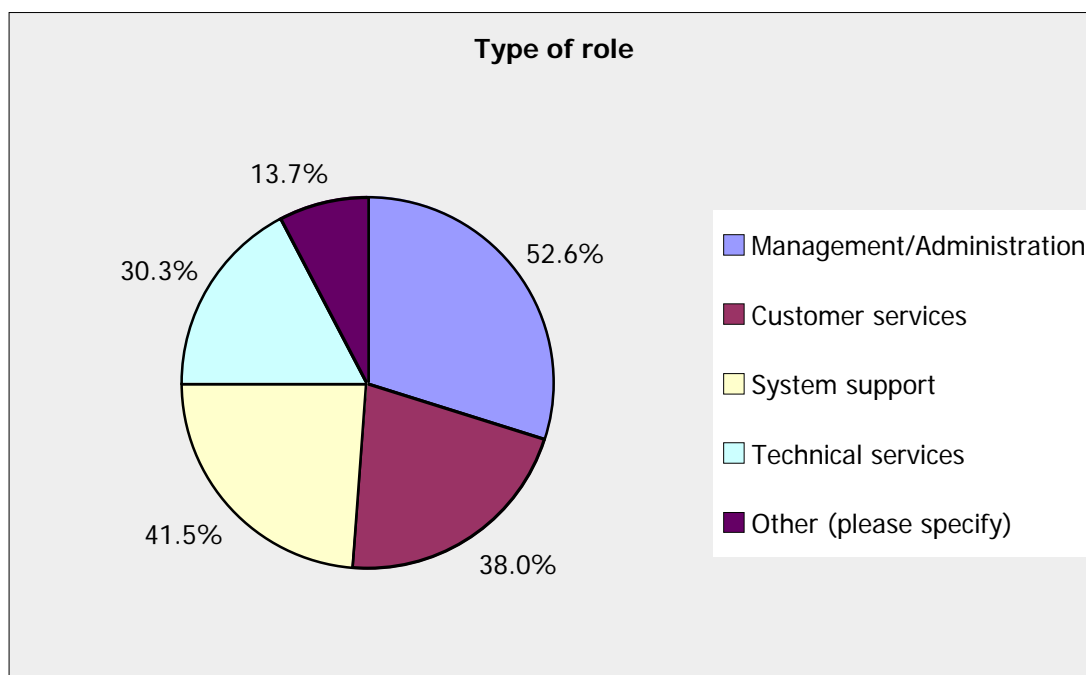
Chart 3: Type of role

ICT frameworks

Provision of environment and infrastructure

In the majority of cases, the parent organisation has a strong role in the provision of ICT environment and infrastructure. 78.9% of respondents indicate their library is a part of a larger organisation, while 21.1% indicated the library is an independent entity. In just under half of libraries (49%), the ICT environment and infrastructure is provided entirely by the parent organisation (for example, university, government department, school or council). 17% of respondents indicated that library ICT environment and infrastructure is provided partly through an outsourcing arrangement, and partly by the parent organisation. A significant number of the 12.2% of respondents who indicated that some other arrangement was in place described scenarios where the parent organisation had a strong role in the provision of the ICT environment and infrastructure.

Respondents who indicated a mixed model (that is, where more than one party is involved in the provision of the environment and infrastructure) were asked to comment on which aspects are provided by which parties. SaaS solutions for library management systems (LMS), in combination with other aspects of environment and infrastructure, being provided by the parent organisation is a model that is frequently mentioned in the comments.

Management and administration of systems

Parent organisations also have a strong role in managing and administrating library systems. In total, 68.1% of respondents indicated the parent organisation has a hand in the management and administration of library systems. See Table 2.

Who manages and administrates the systems used by the library?	
1. Dedicated ICT staff who are employed and managed by the library – parent organisation does not manage or administrate any system used by the library	17.7%
2. Parent organisation's (eg university, government department, school, council) ICT group	15.0%
3. External supplier through an outsourcing arrangement, where the outsourcing arrangement is managed by the library	0.0%
4. External supplier through an outsourcing arrangement, where the outsourcing arrangement is managed by the parent organisation's ICT group (or other external group)	0.0%
5. Combination of library staff and ICT group employed by parent organisation	38.1%
6. Combination of library staff and outsourcing arrangement	8.2%
7. Combination of parent organisation's ICT group and outsourcing arrangement	0.0%
8. Combination of parent organisation's ICT group, library staff and outsourcing arrangement	15.0%
Other (please specify)	6.1%

Table 2: Who manages and administrates the systems used by the library?

Respondents who indicated a mixed management and administration model (that is, where more than one party is involved in management and administration of systems) were asked to comment on which aspects are managed by which parties. The following comments are a sample of those submitted, and are indicative of themes within the comments:

- o *Hardware and infrastructure are managed by the parent organisation's IT department whilst Software including LMS functionailty [sic] are managed by Library staff.*

- o *Library management system has a dedicated library systems administrator but the network is administered by IT. Library staff use web based products such as Wikis and Blogs because IT cant [sic] meet these needs.*

- o *Library catalogue managed by library staff as well as some system support from parent organisation[.] Webpages, ezproxy [sic], SFX and metalib [sic] maintained by the library.*

- o *Content by library, conduits by IT.*

This last statement is perhaps the most telling: it is only in very few cases that library staff are responsible for managing and administrating the 'conduits' for library systems – that is, network, servers and other hardware. Rather, library staff play a strong role in front end service management and system configuration, and act as liaison between staff, the parent organisation's ICT group, and vendors. There was

minimal suggestion in the comments that library staff are involved in the technical tasks that would usually be associated with IT staff, for example, server management, system upgrades, network administration.

Support for the library's ICT
In just over half the responses (54.9%), respondents indicated that library staff have a role in supporting the library's ICT. 38.7% of respondents indicated a situation where the library does not provide any support for ICT. See Table 3.

Who provides support for the library's ICT?	
1. Dedicated ICT staff who are employed and managed by the library – no support from parent organisation	13.4%
2. Parent organisation's (eg university, government department, school, council) ICT group	28.9%
3. External supplier through an outsourcing arrangement, where the outsourcing arrangement is managed by the library	2.1%
4. External supplier through an outsourcing arrangement, where the outsourcing arrangement is managed by the parent organisation's ICT group (or other external group)	3.5%
5. Combination of library staff and ICT group employed by parent organisation	24.6%
6. Combination of library staff and outsourcing arrangement	4.9%
7. Combination of parent organisation's ICT group and outsourcing arrangement	4.2%
8. Combination of parent organisation's ICT group, library staff and outsourcing arrangement	12.0%
Other (please specify)	6.3%

Table 3: Who provides support for the library's ICT?

Respondents who indicated a mixed support model (that is, where more than one party is involved in supporting library ICT) were asked to comment on which aspects are supported by which parties. The comments indicate complex and varying arrangements for the provision of ICT support, and indeed, there are few trends evident across the responses. One respondent provided a brief, but pertinent, comment: *too difficult and detailed*. This sentiment is certainly echoed by the arrangements described by respondents. In general, the comments indicate that the library provides frontline support for the LMS and (in many cases) the library web presence, while infrastructure provided by the parent organisation is, in general, supported by the parent.

- o *desktop support and some servers administered by parent[.] LMS, web and public support by library*

- o *Hardware issues, library web services & network servers = library[.] [I]nternet access and university-wide systems = parent org[.] Really problematic LMS issues = LMS service provider*

Is it time for change?

According to the Gartner Group, cloud computing is a transformational technology that currently sits at what Gartner calls the "Peak of inflated expectations", and is estimated to be two to five years away from mainstream adoption. (Gartner, 2009b, p. 6, 34)

Similarly, OSS in libraries has had considerable press in recent times, especially following a paper released in October 2009 by Stephen Abram. On Stephen's Lighthouse, he stated

> Open source technology in general has become part of the technology discussion of [sic] in many industries including libraries. (Abram 2009)

SaaS solutions have also become viable options for library systems in recent years. It follows, then, that the researchers expected respondents to demonstrate a strong focus on change in terms of ICT models. In fact, the results of the survey were somewhat surprising, indicating that, for a large proportion of respondents, change may not be on the horizon.

43.4% of respondents indicated that the current IT models are unlikely to change in the next five years. A variety of reasons were presented, including indications that the parent organisation was unlikely to allow change, that budget cut backs would prohibit change, and that outsourcing has simply not been presented as an option to date. Of the 63 respondents who indicated the model was unlikely to change, 18 provided a reason. Of those, only three respondents indicated that the situation was unlikely to change because the status quo provided acceptable models.

37.8% of respondents indicated that a change in ICT models was possible over the next five years. Of the 54 respondents that gave this response, 26 provided a reason. These reasons included a potential for cost saving by centralising ICT management with the parent organisation's ICT group, a desire (or external impetus) to collaborate with other libraries, and change in models being necessitated by the adoption of new systems.

18.9% of respondents indicated that change was likely or very likely, citing a need to 'modernise' library services, a constantly changing IT environment, and external pressures like council mergers and industry reform as impetus for change.

A common theme across responses, regardless of whether the respondent indicated change was likely or unlikely, was one of control, particularly for libraries where the parent organisation has a strong hand in the ICT models:

o *… the parent organisation is concerned that network security would be compromised by devolving to other business units. This limits our group of libraries to standard (not evolving) IT services, restricted to an LMS, and heavily firewalled public Internet access.*

o *Restrictions on our website is [sic] holding us back from utilising web2.0 technologies*

- o *… local IT staff … have shown they understand our needs to escape from the suffocating restrictions of the organization's CMS to host the intranet and other services we want to implement.*

- o *Lack of understanding of parent org regarding library needs, lack of transparency a real problem. Library unable to progress key projects due to lack of support from parent. Combative relationship exists rather than collegial - despite many attempts to resolve the situation*

- o *Possible that the City will take more control due to there [sic] model of security*

- o *No indication that parent org will "loosen up" the tight reins on admin rights for staff computers, given their concern over security and information protection. We are likely to continue to host our ILS locally, given the large infrastructure of IT/server support available to us, and the likely difficulty of the library finding funds in our annual budget for an SaaS version.*

About the support providers

Respondents were asked to answer a series of questions about the support providers. Answer choices were *Very false*, *False*, *True*, *Very true* or *N/A*. It should be noted that a number of respondents indicated in the comments that this question was particularly difficult to answer, especially for libraries where the support model is mixed, with support being provided by any combination of the parent organisation, library staff, and an external supplier. In the commentary below, responses of *True* or *Very true* are grouped together and treated as an affirmative response, while response of *False* or *Very false* are grouped together as a negative response.

Do support providers understand library business?

53.9% of all respondents indicated that the support provider demonstrates a good understanding of library business and objectives, while 45.3% of respondents indicated the support providers do not demonstrate a good understanding of library business and objectives. For respondents who indicated that all support is provided by the parent organisation's ICT group, this figure rises slightly, with 47.6% of these respondents indicating that the support providers do not demonstrate a good understanding of library business and objectives. Respondents who indicated that ICT support is provided by dedicated ICT staff employed by the library (that is, library staff provide all support), were more likely to indicate that the support providers demonstrate a good understanding of library business and objectives, with 89.5% of self-supporting libraries selecting either *True* or *Very True* for the same question.

Similarly, 55.4% of all respondents indicated that the support provider demonstrates a good understanding of library development and support requirements, compared to 52.4% of libraries where the support is provided solely by the parent organisation, and 100% of self-supporting libraries.

Across all respondents, 53.2% indicated that the support providers do not have a good understanding of social networking and library 2.0 applications and their uses. For respondents who indicated that all support is provided by the parent organisation, this figure rises to 61.9%. Comparatively, 21.1% of self-supporting libraries (where all support for ICT is provided by staff employed by the library) indicated that the support providers do not have a good understanding of social networking and library 2.0 applications and their uses.

Regardless of the support model, respondents indicated some fairly endemic issues with support providers' understanding of library business in the library 2.0 (and post library 2.0) world. Respondents whose libraries rely solely on the parent organisation for support report the lowest levels of understanding of library IT requirements, with a marginal improvement for hybrid models. Where ICT support is provided by library staff, the support providers' understanding of library business seems to be much stronger (although not always perfect).

Agility and responsiveness
35.7% of respondents who indicated support is provided solely by the parent organisation replied in the affirmative when asked if the support providers are flexible and nimble. Comparatively, 89.5% of self supporting libraries responded in the affirmative to the same question, indicating that the support providers are nimble and flexible, while 44.2% of all respondents indicated that the support providers are flexible and nimble.

44.9% of all respondents indicated the support providers enable the library to respond appropriately to rapidly changing ICT environments. Comparatively, of those respondents who indicated support is provided solely by the parent organisation, 38.1% gave the same response, while 89.4% of self-supporting libraries indicated that the support providers enable them to respond appropriately to rapidly changing ICT environments.

These results research suggests that libraries that are entirely self-supporting are likely to be more agile and better positioned to respond to rapidly changing technology environments than those libraries where support is provided solely by the parent organisation.

Openness to emerging technology, OSS and the cloud
The data indicates that self-supporting libraries are more likely to have an ICT support group that is open to new and emerging technologies, OSS and hosting services in the cloud.

ICT support groups in self-supporting libraries are significantly more engaged in keeping library staff abreast of new developments in technology than their counterparts in libraries with other support models. 29.7% of all respondents indicated that the ICT support group provides regular updates to library staff about new developments in ICT, while 21.4% of respondents in libraries where ICT support is provided solely by the parent organisation indicated the same. Comparatively, 63.2% of respondents in self-supporting libraries indicated that the ICT group provides these kinds of updates.

As a technology concept that the Gartner Group identifies as 'early mainstream' (Gartner 2009b p.53) in terms of its adoption, one would expect that levels of support for Web 2.0 applications and services should be on the rise, particularly given recent discussion around the topic of Government 2.0 (Di Maio, 2009b). Overall, 47.8% of respondents indicated the ICT support group provides support for Web 2.0 applications and services, compared to 43.9% of respondents in libraries where ICT support is provided solely by the parent organisation. Support for Web 2.0 applications and services is significantly higher in self-supporting libraries, with 79%

of respondents in self-supporting libraries indicated that the ICT support group provides this support.

Self-supporting libraries are also leading the way in uptake of OSS, with 68.5% of respondents from self-supporting libraries indicated that the ICT support group uses and supports OSS. Overall, 41.3% of respondents indicated that the ICT support group uses and supports OSS, while 26.1% of respondents in libraries where ICT support is provided solely by the parent organisation gave the same response.

The trend towards moving services to the cloud is not as pronounced in self-supporting libraries as the researchers expected, with only 31.6% of respondents from self-supporting libraries indicating that the ICT support group is moving services to the cloud. Comparatively, 25% of all respondents indicated that the ICT support group is moving services to the cloud, as did 14.6% of respondents in libraries where ICT support is provided solely by the parent organisation. One reason for this might be that self-supporting libraries are more agile and better able to respond to changes in technologies through local solutions, and therefore do not seek out cloud-based solutions simply to 'get the job done'. It would be interesting to pursue this idea in further research.

Staff skills
73.7% of respondents who indicated the library has its own ICT staff who provide all ICT support also indicated that those staff have all the skills required to support library applications. Comparatively, 52.9% of all respondents indicated that the ICT support staff have all the skills required, while 46.3% of respondents who indicated the parent organisation is responsible for support gave the same response. Staff skills will be discussed in greater detail later in this paper.

System hosting options and rationale for choices
The survey posed questions that asked participants about hosting options for library systems as well as the rationale for choice of hosting options. The intent of this area of the survey was to begin to draw out themes in reasons for use of cloud-based and SaaS solutions for a variety of library systems (see Table 4 – please note that in the survey examples of the different technologies were included but have been removed here due to lack of space. Please refer to Appendix C).

Hosting options by system type

	Hosted locally by library (%)	Hosted locally by non-library ICT group (%)	Hosted externally (but you know where it is) for a fee (eg LMS SaaS) (%)	Hosted externally (in the cloud) for a fee (eg wiki on a plan at pbworks) (%)	Hosted externally (in the cloud) as a free service (eg blog at wordpress.com) (%)	Hosted externally by 3rd party (could include collaborative arrangements) (%)
Library management system	40.9	32.2	20.9	0.9	0.0	5.2
Federated search system	26.8	14.3	30.4	1.8	0.0	26.8
Electronic resource management system	37.7	21.3	23.0	3.3	1.6	13.1
Discovery software	37.5	34.4	25.0	3.1	0.0	0.0
Content management system	36.8	42.6	11.8	2.9	0.0	5.9
Blogging software	20.8	19.4	1.4	6.9	47.2	4.2
Wiki software	25.0	25.0	3.1	14.1	28.1	4.7
Reference enquiry management system	53.3	33.3	4.4	0.0	4.4	4.4
Help desk / support enquiry management system	29.2	55.6	9.7	0.0	0.0	5.6
Event management / booking software	45.3	35.8	3.8	3.8	9.4	1.9
Document delivery system	39.2	13.5	24.3	2.7	1.4	18.9
Project management software	30.6	61.1	8.3	0.0	0.0	0.0
Forum software	25.0	46.4	10.7	3.6	7.1	7.1
Chat or instant messaging software	13.7	27.5	9.8	5.9	31.4	11.8
Reference tools	61.9	19.0	7.1	2.4	7.1	2.4
Link resolver	36.5	23.1	23.1	3.8	1.9	11.5
Booking system	51.9	37.0	7.4	1.9	1.9	0.0
Print management system	53.2	44.2	2.6	0.0	0.0	0.0
Reverse proxy authentication system	39.4	45.5	9.1	1.5	1.5	3.0
Authentication system	27.8	62.5	8.3	0.0	0.0	1.4

Table 4: Hosting options by system type (systems with 10% or greater representation for cloud-based or SaaS solutions highlighted)

It is difficult to make generalisations across the data, as the range of systems used by libraries is so diverse. Likewise, there is not scope in this paper to address all systems individually. Therefore, the following sections will examine in detail the choice of hosting options for three systems where there was a strong indication that libraries are using SaaS and/or cloud-based solutions: LMS, blogging software, and wiki software.

SaaS solutions for LMS
20.9% of respondents who responded to the question regarding hosting options for the Library Management System indicated that their library's LMS was provided as a SaaS solution. (A further 1% indicated that the LMS was provided as a cloud-based, for fee service.)

Reasons cited for the decision to use a SaaS solution included:
- o Most cost effective option (54.2%)
- o Library does not have necessary skills to host/manage internally (37.5%)
- o Parent ICT organisation unable/unwilling to provide a local solution (29.2%)
- o Library has more control over system (16.7%)
- o Implementation more timely (12.5%)
- o Don't know the reason (8.3%)
- o Contractual obligation/advantage (4.2%)

SaaS and cloud-based solutions for blogging software
Of the respondents who indicated a hosting choice for blogging software, 47.2% indicated that blogs are hosted in the cloud using a free service. A further 1.4% indicated that a SaaS solution is used, and 6.9% indicated that a for-fee cloud-based service is used. In all, 55.5% of respondents indicated a SaaS or cloud-based solution was in place.

Reasons cited for the decision to use a SaaS or cloud-based solution included:
- o Most cost effective option (40.5%)
- o Library has more control over system (27%)
- o Parent ICT organisation unable/unwilling to provide local solution (27%)
- o Implementation more timely (16.2%)
- o No other option at the time (10.8%)
- o Library does not have necessary skills to host/manage internally (8.1%)
- o Don't know the reason (5.4%)

SaaS and cloud-based solutions for wiki software
Of the respondents who indicated a hosting choice for wiki software, 28.1% indicated that wikis are hosted in the cloud using a free service. A further 3.1% indicated that a SaaS solution is used, and 14.1% indicated that a for-fee cloud-based service is used. In all, 45.3% of respondents indicated a SaaS or cloud-based solution was in place.

Reasons cited for the decision to use a SaaS or cloud-based solution included:

- Most cost effective option (50%)
- Parent ICT organisation unable/unwilling to provide local solution (25%)
- Eliminated / reduced red tape - implementation easier (17.9)
- Implementation more timely (14.3%)
- Library has more control over system (10.7%)
- No other option at the time (10.7%)
- Library does not have necessary skills to host/manage internally (7.1%)
- Don't know the reason (7.1%)
- The decision was made for us (3.6%)

Library systems and skills survey

1. Introduction

First, and most important - how much time is this going to take?
We estimate it should take you about 15 minutes to complete this survey. We know your time is valuable, and we appreciate that you've made it this far!

What's this survey for?
The purpose of this survey is to gather information about the models for support and management of ICT in libraries.

The aim is to develop a picture of

- Who provides the ICT environment and infrastructure in libraries
- Who supports the ICT environment and infrastructure in libraries
- Which systems/software libraries are choosing to host locally, which are hosted 'in the cloud', and which are provided under Software as a Service arrangements
- Why libraries have chosen the hosting options that are in place
- What skills librarians need to support systems and software
- Whether librarians possess the skills needed to support systems and software

The results of the survey will inform a paper to be presented at VALA 2010.

Anonymity
No personal information or information that specifically identifies your library will be collected in this survey. However, we may use geographical and sectoral information to make some generalisations about the research.

Who's running this survey?
A couple of tech-ish librarians from the Gold Coast, Australia - Carolyn McDonald and Kate Davis. You can follow us on Twitter, if you want to see what we're about (and find out about the progress of this research, too). We're @camcd and @katiedavis respectively.

Some definitions to help you complete the survey
Throughout this survey the following terms will be used.

Open Source Software (OSS)
Open source describes a broad general type of software license that makes source code available to the general public with relaxed or non-existent

copyright restrictions. See: http://en.wikipedia.org/wiki/Open_source#The_Open_Source_Definition

Cloud computing and Software as a Service (SaaS)
Increasingly it seems people are using these two terms interchangeably. For the purpose of this survey, cloud computing is more general - ie you could just be storing your data in the cloud, or using a cloud-based services as an adjunct for what you have on your desktop (eg for sharing slides with others via Slideshare or videos via youtube). Many of the cloud-based services libraries use are free, but some of them aren't. SaaS is where you contract with a vendor (or support company) to provide (usually their) software as a service, and so you access it over an Internet connection, from where ever they may choose to locate it.

1. Do you work in a library, or have you worked in a library in the past?

    Yes

    No

2. Where are you located?

    Africa

    Asia

    Australia/New Zealand

    Europe

    North America

    South America

3. Are you a qualified librarian or library technician?

    Yes

    No

4. Do you have any IT qualifications or experience?

◯ Yes

◯ No

If yes, please list qualifications or experience

5. Please select your library type.

◯ Public

◯ Academic

◯ K-12

◯ Vocational Education (TAFE)

◯ Special

◯ State or National

◯ Other (please specify)

6. Does your library operate as an independent entity, or are you part of a larger organisation?

◯ Independent entity

◯ Part of larger organisation

Library systems and skills survey

7. Please select from the following list the description(s) that best fits your role. You may choose more than one group.

- ∈ Management/Administration

- ∈ Customer services

- ∈ System support

- ∈ Technical services

- ∈ Other (please specify)

  [   ]

8. If you do not work in a library, or if you are responding to this survey as a non-library worker, please describe your position.

[   ]

Library systems and skills survey

2. Relationship between ICT group and Library

This page is to collect information about the ICT model under which your library operates, and how it is managed. It also asks about how ICT support is provided to your library, and how effective it is.

1. Who provides the ICT environment and infrastructure used by your library?

jn 1. Library operates an independent ICT environment and infrastructure that is provided by the library (not the parent organisation)

jn 2. ICT environment and infrastructure is provided entirely by parent organisation (eg university, government department, school, council)

jn 3. Library ICT environment and infrastructure is provided through an outsourcing arrangement that is managed by the library

jn 4. Library ICT environment and infrastructure is provided through an outsourcing arrangement that is managed by the parent organisation's ICT group (or other external group)

jn 5. Library ICT environment and infrastructure is provided partly through an outsourcing arrangement, and partly by the library (not the parent organisation) Example: LMS is provided as a SaaS solution but all other components of ICT environment and infrastructure are provided by the library itself

jn 6. Library ICT environment and infrastructure is provided partly through an outsourcing arrangement, and partly by the parent organisation. Example: LMS is provided as a SaaS solution but all other components of ICT environment and infrastructure are provided by parent organisation

jn Other (please specify)

2. If the library's ICT environment and infrastructure is provided by more than one party (options 5 and 6 above), please elaborate on which aspects are provided and managed by which parties.

Library systems and skills survey

3. Who manages and administrates the systems used by the library?

When answering this question, consider that the systems used by the library might include:

-Library Management System

-Reference enquiry management system

-Chat reference system

-and so on

- *jn* 1. Dedicated ICT staff who are employed and managed by the library – parent organisation does not manage or administrate any system used by the library

- *jn* 2. Parent organisation's (eg university, government department, school, council) ICT group

- *jn* 3. External supplier through an outsourcing arrangement, where the outsourcing arrangement is managed by the library

- *jn* 4. External supplier through an outsourcing arrangement, where the outsourcing arrangement is managed by the parent organisation's ICT group (or other external group)

- *jn* 5. Combination of library staff and ICT group employed by parent organisation

- *jn* 6. Combination of library staff and outsourcing arrangement

- *jn* 7. Combination of parent organisation's ICT group and outsourcing arrangement

- *jn* 8. Combination of parent organisation's ICT group, library staff and outsourcing arrangement

- *jn* Other (please specify)

4. If the library's ICT environment and infrastructure is managed by more than one party (options 5, 6, 7 and 8 above), please elaborate on which aspects are managed by which parties.

Library systems and skills survey

5. Who provides support for the library's ICT?

jn 1. Dedicated ICT staff who are employed and managed by the library – no support from parent organisation

jn 2. Parent organisation's (eg university, government department, school, council) ICT group

jn 3. External supplier through an outsourcing arrangement, where the outsourcing arrangement is managed by the library

jn 4. External supplier through an outsourcing arrangement, where the outsourcing arrangement is managed by the parent organisation's ICT group (or other external group)

jn 5. Combination of library staff and ICT group employed by parent organisation

jn 6. Combination of library staff and outsourcing arrangement

jn 7. Combination of parent organisation's ICT group and outsourcing arrangement

jn 8. Combination of parent organisation's ICT group, library staff and outsourcing arrangement

jn Other (please specify)

6. If the library's ICT support is provided by more than one party (options 5, 6, 7 and 8 above), please elaborate on how the responsibility is split.

7. How much input did the library have in determing these models?

- ◯ The library developed the models

- ◯ The library had significant input into determining the models

- ◯ The library had some input into determing the models

- ◯ The library had little input into determing the models

- ◯ The library had no input into determing the models

Comment

8. How likely are these models to change in the next 5 years?

- ◯ Unlikely

- ◯ Possibly

- ◯ Likely

- ◯ Very likely

Why?

Library systems and skills survey

9. Please rate the following statements as they apply to those responsible for providing the support your library receives. The support providers:

	Very false	False	True	Very true	N/A
Is only interested in providing core business services such as email, word processing and file and print services	ʝ∩	ʝ∩	ʝ∩	ʝ∩	ʝ∩
Is moving services to the cloud	ʝ∩	ʝ∩	ʝ∩	ʝ∩	ʝ∩
Has staff with all the skills required to support library applications	ʝ∩	ʝ∩	ʝ∩	ʝ∩	ʝ∩
Provides direct support to library customers for library ICT problems	ʝ∩	ʝ∩	ʝ∩	ʝ∩	ʝ∩
Provides regular updates to library staff about new developments in ICT	ʝ∩	ʝ∩	ʝ∩	ʝ∩	ʝ∩
Enables the library to respond appropriately to rapidly changing ICT environments	ʝ∩	ʝ∩	ʝ∩	ʝ∩	ʝ∩
Has a good understanding of social networking and library 2.0 applications and their uses	ʝ∩	ʝ∩	ʝ∩	ʝ∩	ʝ∩
Has individual staff who are great but the organisation restricts how much they can assist the library	ʝ∩	ʝ∩	ʝ∩	ʝ∩	ʝ∩
Provides support for web 2.0 applications and services	ʝ∩	ʝ∩	ʝ∩	ʝ∩	ʝ∩
Demonstrates a good understanding of library business and objectives	ʝ∩	ʝ∩	ʝ∩	ʝ∩	ʝ∩
Does not provide a clear method of communication between library and ICT group for regular discussions about library ICT requirements	ʝ∩	ʝ∩	ʝ∩	ʝ∩	ʝ∩
Works with the library to allocate	ʝ∩	ʝ∩	ʝ∩	ʝ∩	ʝ∩

priorities to requests for services that meets the library needs					
Demonstrates a good understanding of library development and support requirements	j⌐	j⌐	j⌐	j⌐	j⌐
Controls which services our staff and customers can access on the internet	j⌐	j⌐	j⌐	j⌐	j⌐
Is responsive to requests for new services	j⌐	j⌐	j⌐	j⌐	j⌐
Is flexible and nimble	j⌐	j⌐	j⌐	j⌐	j⌐
Works strictly within Service Level Agreements	j⌐	j⌐	j⌐	j⌐	j⌐
Uses and supports open source software	j⌐	j⌐	j⌐	j⌐	j⌐

Comments

10. If the library does not manage its own ICT environment and infrastructure or provide its own support, how would you describe the relationship between the library and the group that provides ICT infrastructure and/or support?

jn Healthy - Characterised by free-flowing communication (both formal and informal) in both directions, enabling efficiencies and realisation of desired outcomes. Both the library and the ICT group / outsourcing partner have a solid understand each other's processes and objectives.

jn Mostly healthy - Communication is usually free-flowing, could be improved. Both the library and the ICT group / outsourcing partner generally understand each other's needs, however there are some gaps in understanding that impact on realisation of desired outcomes from time-to-time.

jn Unhealthy - Communication channels are not effective. Either the library or the ICT group / outsourcing partner does not understand the needs of the other party (or both). Realisation of desired outcomes is severely impacted.

Comments

Library systems and skills survey

3. Software and hosting models

This page is to gather information about the decisions your library has made with regard to software hosting options, and why.

1. Please indicate by ticking the relevant box which of the following systems your library uses, and where it is hosted.

	Hosted locally by library	Hosted locally by non-library ICT group	Hosted externally (but you know where it is) for a fee (eg LMS SaaS)	Hosted externally (in the cloud) for a fee (eg wiki on a plan at pbworks)	Hosted externally (in the cloud) as a free service (eg blog at wordpress.com)	Hosted externally by 3rd party (could include collaborative arrangments)	Other
Library management system	jn	jn	jn	jn	jn	jn	jn
Federated search system	jn	jn	jn	jn	jn	jn	jn
Electronic resource management system	jn	jn	jn	jn	jn	jn	jn
Discovery software (eg Primo, Encore, AquaBrowser)	jn	jn	jn	jn	jn	jn	jn
Content management system	jn	jn	jn	jn	jn	jn	jn
Blogging software	jn	jn	jn	jn	jn	jn	jn
Wiki software	jn	jn	jn	jn	jn	jn	jn
Reference enquiry management system	jn	jn	jn	jn	jn	jn	jn
Help desk / support enquiry management system	jn	jn	jn	jn	jn	jn	jn
Event management / booking software	jn	jn	jn	jn	jn	jn	jn
Document delivery system	jn	jn	jn	jn	jn	jn	jn
Project management software	jn	jn	jn	jn	jn	jn	jn
Forum software	jn	jn	jn	jn	jn	jn	jn
Chat or instant messaging software	jn	jn	jn	jn	jn	jn	jn
Reference tools (eg software for development/delivery of subject	jn	jn	jn	jn	jn	jn	jn

guides)							
Link resolver	jn	jn	jn	jn	jn	jn	jn
Booking system	jn	jn	jn	jn	jn	jn	jn
Print management system	jn	jn	jn	jn	jn	jn	jn
Reverse proxy authentication system (eg ezproxy)	jn	jn	jn	jn	jn	jn	jn
Authentication system (eg Active Directory)	jn	jn	jn	jn	jn	jn	jn

Any other systems your library uses? Any comments?

2. Why were the options above chosen? You may want to select more than one reason.

	Most cost effective option	Library has more control over system	Library does not have necessary skills to host/manage internally	Implementation more timely	Elliminated / reduced red tape - implementation easier	Parent ICT organisation unable/unwilling to provide local solution	No other option at the time	The decision was made for us	Contractual obligation / advantage	Don't know the reason
Library management system	∈	∈	∈	∈	∈	∈	∈	∈	∈	∈
Federated search system	∈	∈	∈	∈	∈	∈	∈	∈	∈	∈
Electronic resource management system	∈	∈	∈	∈	∈	∈	∈	∈	∈	∈
Discovery software (eg Primo, Encore, AquaBrowser)	∈	∈	∈	∈	∈	∈	∈	∈	∈	∈
Content management system	∈	∈	∈	∈	∈	∈	∈	∈	∈	∈
Blogging software	∈	∈	∈	∈	∈	∈	∈	∈	∈	∈
Wiki software	∈	∈	∈	∈	∈	∈	∈	∈	∈	∈
Reference enquiry management system	∈	∈	∈	∈	∈	∈	∈	∈	∈	∈
Help desk / support enquiry management system	∈	∈	∈	∈	∈	∈	∈	∈	∈	∈
Event management / booking software	∈	∈	∈	∈	∈	∈	∈	∈	∈	∈
Document delivery system	∈	∈	∈	∈	∈	∈	∈	∈	∈	∈
Project management software	∈	∈	∈	∈	∈	∈	∈	∈	∈	∈
Forum software	∈	∈	∈	∈	∈	∈	∈	∈	∈	∈
Chat or instant messaging software	∈	∈	∈	∈	∈	∈	∈	∈	∈	∈
Reference tools (eg software for development/delivery of subject guides)	∈	∈	∈	∈	∈	∈	∈	∈	∈	∈
Link resolver	∈	∈	∈	∈	∈	∈	∈	∈	∈	∈
Booking system	∈	∈	∈	∈	∈	∈	∈	∈	∈	∈
Print management system	∈	∈	∈	∈	∈	∈	∈	∈	∈	∈

Reverse proxy authentication system (eg ezproxy)	∈	∈	∈	∈	∈	∈	∈	∈	∈	∈
Authentication system (eg Active Directory)	∈	∈	∈	∈	∈	∈	∈	∈	∈	∈

Any other factors that contributed to decisions on hosting?

Library systems and skills survey

4. Skills

This section is about determing the role library staff (including any ICT library staff) play in implementing and managing the library's software and systems, and the skills required to do so.

1. What roles did library staff play in selecting, planning and implementing each of these systems/software? (Leave blank where your library does not have a particular system/software, or note in the comments box other systems)

	Evaluation	Selection	Planning	Project management	Change management	Purchasing/implementing hardware	Training	Configuration
Library management system	€	€	€	€	€	€	€	€
Federated search system	€	€	€	€	€	€	€	€
Electronic resource management system	€	€	€	€	€	€	€	€
Discovery software (eg Primo, Encore, AquaBrowser)	€	€	€	€	€	€	€	€
Content management system	€	€	€	€	€	€	€	€
Blogging software	€	€	€	€	€	€	€	€
Wiki software	€	€	€	€	€	€	€	€
Reference enquiry management system	€	€	€	€	€	€	€	€
Help desk / support enquiry management system	€	€	€	€	€	€	€	€
Event management / booking software	€	€	€	€	€	€	€	€
Document delivery system	€	€	€	€	€	€	€	€
Project management software	€	€	€	€	€	€	€	€
Forum software	€	€	€	€	€	€	€	€
Chat or instant messaging software	€	€	€	€	€	€	€	€
Reference tools (eg software for development/delivery of subject	€	€	€	€	€	€	€	€

guides)								
Link resolver	€	€	€	€	€	€	€	€
Booking system	€	€	€	€	€	€	€	€
Print management system	€	€	€	€	€	€	€	€
Reverse proxy authentication system (eg ezproxy)	€	€	€	€	€	€	€	€
Authentication system (eg Active Directory)	€	€	€	€	€	€	€	€

Comments

Library systems and skills survey

2. What roles do library staff play in managing and supporting these systems on an ongoing basis?

	Training	Configuration	Technical support	Application support	Hardware/operating system support	Backups	Upgrades	Troubleshooting	Development	Content production	Content loading
Library management system	∈	∈	∈	∈	∈	∈	∈	∈	∈	∈	∈
Federated search system	∈	∈	∈	∈	∈	∈	∈	∈	∈	∈	∈
Electronic resource management system	∈	∈	∈	∈	∈	∈	∈	∈	∈	∈	∈
Discovery software (eg Primo, Encore, AquaBrowser)	∈	∈	∈	∈	∈	∈	∈	∈	∈	∈	∈
Content management system	∈	∈	∈	∈	∈	∈	∈	∈	∈	∈	∈
Blogging software	∈	∈	∈	∈	∈	∈	∈	∈	∈	∈	∈
Wiki software	∈	∈	∈	∈	∈	∈	∈	∈	∈	∈	∈
Reference enquiry management system	∈	∈	∈	∈	∈	∈	∈	∈	∈	∈	∈
Help desk / support enquiry management system	∈	∈	∈	∈	∈	∈	∈	∈	∈	∈	∈
Event management / booking software	∈	∈	∈	∈	∈	∈	∈	∈	∈	∈	∈
Document delivery system	∈	∈	∈	∈	∈	∈	∈	∈	∈	∈	∈
Project management software	∈	∈	∈	∈	∈	∈	∈	∈	∈	∈	∈
Forum software	∈	∈	∈	∈	∈	∈	∈	∈	∈	∈	∈
Chat or instant messaging software	∈	∈	∈	∈	∈	∈	∈	∈	∈	∈	∈
Reference tools (eg software for development/delivery of subject guides)	∈	∈	∈	∈	∈	∈	∈	∈	∈	∈	∈
Link resolver	∈	∈	∈	∈	∈	∈	∈	∈	∈	∈	∈
Booking system	∈	∈	∈	∈	∈	∈	∈	∈	∈	∈	∈
Print management system	∈	∈	∈	∈	∈	∈	∈	∈	∈	∈	∈
Reverse proxy authentication system (eg ezproxy)	∈	∈	∈	∈	∈	∈	∈	∈	∈	∈	∈
Authentication system (eg Active Directory)	∈	∈	∈	∈	∈	∈	∈	∈	∈	∈	∈

Library systems and skills survey

Comments

```
[                                    ▲]
[                                    ]
[                                    ]
[                                    ▼]
```

3. Which of the following IT skills do you think are necessary to enable library staff to adequately support the library systems? Please indicate the level.

	Basic	Medium	Advanced
Project Management	∈	∈	∈
Programming (eg Javascript,.NET, J2EE)	∈	∈	∈
HTML	∈	∈	∈
Advanced web skills	∈	∈	∈
Design skills	∈	∈	∈
Training skills	∈	∈	∈
LAMP (Linux, Apache, MySQL, Perl)skills	∈	∈	∈
Oracle/SQL or other database skills	∈	∈	∈

Other skills

```
[                                    ▲]
[                                    ]
[                                    ▼]
```

Library systems and skills survey

4. Of the skills you identified as necessary, please indicate whether library staff currently possess them at an adequate level

	Skills currently not possessed by library staff	Basic / medium level skill possessed, but up skilling required	Library staff have appropriate skill level
Project management	∈	∈	∈
Programming (eg Javascript,.NET, J2EE)	∈	∈	∈
HTML	∈	∈	∈
Advanced web skills	∈	∈	∈
Design skills	∈	∈	∈
Training skills	∈	∈	∈
LAMP (Linux, Apache, MySQL, Perl)skills	∈	∈	∈
Oracle/SQL or other database skills	∈	∈	∈

Other skills you think are necessary

Library systems and skills survey

5. Thank you

This is the end of the survey. Thank you for taking to time to complete it. The results will be included in a presentation at VALA 2010.

Please contact us if you have any questions, following completion of the survey. (Twitter: @katiedavis and @camcd. Email: esl@goldcoast.qld.gov.au)