Online Information Services Model: Adopting and Aligning Technology with Our Competencies

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Abstract

Since the evolution of information and communication technologies in the past decade, most libraries and librarians have experienced the widespread embracement of Web 2.0 technologies and the pervasiveness of mobile devices in their discussion on data management today. It has always been a challenge for librarians to keep up-to-date with the technologies. But, it has never been an impossible mission for most librarians who have the passion for building and developing online information services for the community and these are also the current challenges faced library vendors (or partners). On the other side, there are online information providers such as Google which keeps on changing their business model and possessing strong financial support to improve their online services. Amazon is another example and a possible alternative to the library industry. Where do the libraries and librarians stand within the online information services industry, especially, in addressing the questions related to coping with technologies to improve the online information services model that the library's management needs to keep up-to-date with. This paper discusses the challenges from the point of view of a young librarian with experiences in librarianship, being a vendor and an entrepreneur who builds information portals for the communities. In addition, this paper will also share some frameworks that are taught in libraries and library schools that have been adopted to meet the needs of its users and clientele as well as employers of library school graduates. It is through the "awareness-knowledge-experimentation-immersion" educational paradigm that has guided successful librarians to step out of their comfort zone into the competitive industry. They learned to progressively cope with the technological knowledge and economics of the industry. It does not matter if the knowledge is from an open source, proprietary, outsourced or in-house system. They have learned to build a versatile, scalable library especially as an online information service for the community to adopt, embrace, engage and utilise. Hopefully, the issues that will be discussed in this paper will help some of the future librarians to grow.

Keywords: Library and information science; Librarians; Knowledge; Personal development; Information technology

INTRODUCTION

The world has crossed into the second half of 2015. It seems only yesterday when most librarians were still discussing about the adoption of social media, Web 2.0 or even Library 2.0 as part of their information services. In 2008, Foo and Ng discussed the impact of Web 2.0 and Library 2.0 on the information landscape that librarians have to face especially the the challenges in revolutionising their online information services. They have also highlighted a number of examples of Web 2.0 applications that the libraries have adopted. They also discussed the library schools' responses in educating information professionals to meet the needs of this emerging new age libraries at that point of time. Prior to this, Al-Hawamdeh and Foo (2001) investigated the competencies and skills set of an information professional needed to perform and contribute to the information economy in the next five years. The library profession was addressed and acknowledged as one of the key contributions to the growth of information economy, especially for the community to appreciate the cultural institutional

values and build a knowledge contributing society. In addition, current structures such as competencies and skills set are needed for everyone to perform a task for any organisation so as to stay at a competitive edge in the commercial organisation. This boils down to the question of coping with technology.

The task of building and developing a library has moved way beyond that of just a service desk with shelves of books and computer terminals for access. With the advent of today's information communication technology, most libraries in the world have shifted their information services to support the net generation today (Oblinger and Oblinger, 2005). When the discussion focuses on the past operations, systems like the library management system was the only primary challenge. At most, the library management system will consists of only a few modules such as the Online Public Access Catalogue, acquisition module, patron module and financial system (where payment for fines and monitoring the acquisition of resources are the only tasks a librarian needs to handle and support in the daily running of the library).In addition to this, in order to enhance its services, the library will have a number of library terminals for their patrons to use or surf the net. This is the scenario that most librarians have experienced back in the 1980s and early 1990s.

Today, most libraries are a few steps ahead. More information systems are added to scale up and enhance the operations of online services. For example, additional systems are added such as web discovery services, link resolvers, content management system, customer relationship system (to support frequently asked question) and many other interactive systems including those needed to support the operational works. Due to this, a number of challenges arose such as resources, manpower, knowledge, time and budget. Apart from these challenges, there are external factors in which the librarians need to justify and request for to their management. In most libraries, the management always has the old perception and does not see the library as an asset that can be aligned strategically to support the business operation of the organisation. Thus, libraries face a slow growth in this landscape and have to look to other alternatives to raise the bar within the online information service.

Sailing The Rough SEAS

Similarly, in other industries, especially the online or digital industry, according to Porter's (2008) findings, there are always these five competitive forces that either shape or destroy the strategy of the business model (or services). For example, in a library's model, librarians need to be aware and factor in threat of a new entry, supplier power, threat of substitution, competitive rivalry and purchasing power (Figure 1).

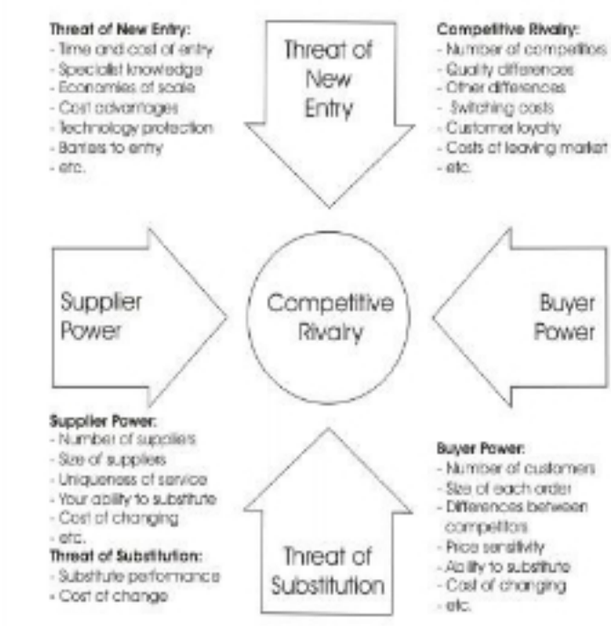

Figure 1: Porter's five forces

Lateral to the library's model, online books sellers, music service providers, data providers and many other information providers are frequently changing their service model in order to remain competitive and sustainable. This move can be observed in providers such as Google, Amazon Books and many others (Hartman and Mullen, 2008; Norris, 2006; Bell, 2002). This will further influence the publishers to change their online service model and they will remain competitive by offering the libraries a better service model. As a result, the costs of products and services will increase and the focus will have to be on building the collection (Anderson, 2013). In addition, most libraries will continue to face challenges as they deal with inadequate budgets, where their work has become more complex (Breeding, 2013). Form Porter's model (Figure 1), librarians are able to draw out a strategic plan and understand which systems, applications and tools are the best for them. This is possible for growing or building a competitive yet scalable technology that will aid the online information system.

Librarians can also look at the Henderson and Venkatraman's (1993) IT strategic alignment model. The model is defined in terms of four fundamental domains of strategic choice namely business strategy; information technology strategy; organisational infrastructure and processes; and information technology infrastructure and processes - each with its own underlying dimensions.

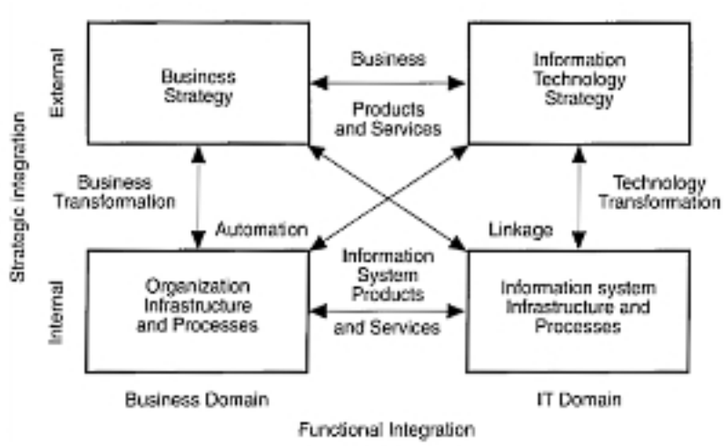

Figure 2: Strategic IT alignment

Further, librarians can be encourage to look into the Henderson and Venkatraman's (1993) IT strategic alignment model. The model is defined in terms of four fundamental domains of strategic choice: (1) business strategy, (2) information technology strategy, (3) organisational infrastructure and processes, and (4) information technology infrastructure and processes - each with its own underlying dimensions. Strategic alignment model are usually used in aligning the business, IT, organisation strategies and information system infrastructure and processes to ensure that there is a strategic and functional integration. This approached, the information technology of the organisation is able to scale up and sustain to support the business (Henderson and Venkatraman, 1991). On the other hand, librarians are aware that in a long run more applications will be added to support the evolving user's demand in using library's online information services. And, it can be seen today in building a library's online information services.

This will lead to the Tallon and Pinsonneault (2011) conceptual model. In this model, librarians need to adjust strategies accordingly to meet the objectives and move towards the vision and mission.

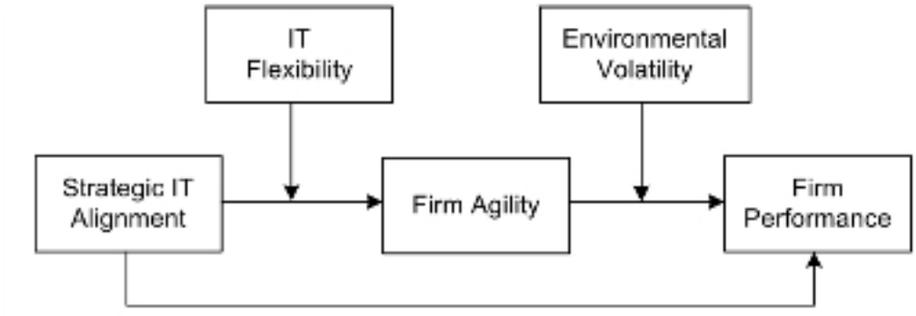

Diagram 3: Conceptual model flow for IT adoption

The knowledge needed to build a digital library is beyond the traditional abilities of a librarian. It has evolved tremendously and there is a requirement for a in-depth knowledge in information management, technology, usability, functionally and legal issues. This is challenging to most librarians as we serve the digital native or next generation.

AT A GLANCE Open Source

Many developers have developed web applications or systems using the open source software (OSS) for a number of successful online information services. Libraries also tend to look and investigate into the practice of adopting OSS. Additionally, OSS applications tend to to be collaborative in nature and there is a blurring line between rapid and agile proto-typing

The Free Software Foundation (2015) defines OSS as:

> "... the term "open source" software is used to mean more or less the same category as free software. But, it is not the same class of software, where they accept some licenses that consider too restrictive, and there are free software licenses they have not accepted. However, the differences in extension of the category are small: nearly all free software is open source, and nearly all open source software is free" (Free Software Foundation, 2015).

This is the difference that every developer should be aware of about OSS. There are a number of benefits in using OSS (Bonaccorsi and Rossi, 2003; Hecker, 1999; Hippel, 2001; Noyes, 2010) such as:

i. Software does not depend on any specific hardware or operating system platform to function.
ii. With OSS, people can have any number of copies of programs on their machines, at home or at work.
iii. Since source code is available, one can customise the software as per the requirements.
iv. It is possible to incorporate the software into another program to perform new functions.
v. If the user base of open source is large, it can sustain in the market for a long time.
vi. Since developers working for open source are spread across the world, its development does not depend on any single person/community. Hence, new release versions can frequently be made available to the community.
vii. There is large community of people who work on popular open source. Hence new versions of the OSS are regularly available to the community.
viii. There is a group of community who can provide support through mailing lists and internet relay chat centers to get quick answer to any problem/query.
ix. Since it is open source, there is no data loss as well as with open standards/formats. Hence, it is easy to retrieve data for future.

There are also drawbacks of using OSS (Dahlander and Magnusson, 2005; Pearlson and Saunders, 2004), such as:

i. Lack of formal support and training that a commercial software package offers.
ii. Often software support is provided only through mailing lists and discussion forums.
iii. Installing and maintaining OSS generally requires a technical knowledge than that required for commercial software.
iv. OSS are also not known for ease of use as the focus is usually on functionality

Open source, proprietary or cloud software

It is challenging for librarians to choose either open source, proprietary or cloud software. These are also known as the type of license for computer software. Each license has its own strengths, challenges, opportunities and threats upon adopting them to be part of the library architecture system. The frameworks mentioned in this paper are guides to a simple and initial step of adoption before moving to a scalable system. There are some of the best practices that are carried out by IT project managers to

build a meaningful online information services strategically as a part of a construction IT portfolio for their library IT architecture.

On PC World's website, Jackson (2011) reported that Redmonk analyst, Stephen O'Grady said that "A lot of software innovation today is being driven by organizations that aren't in the business of selling software, which means that a great deal of it is open source" and "Proprietary software's role as the primary innovator in the market is, effectively, over." On the library's front, more library IT vendors are either building or revamping new platforms to be integrated as part of the library's online information service model for the past five years. Vendors like EBSCO, Ex Libris, Proquest and others are introducing web discovery platforms to enhance the experience of searching and retrieving the library's collection for the end user. Breeding (2015) in the Library System Report noted that the library management system such as SirsiDynix, Innovative Interfaces, Inc and OCLC are still at the frontier of innovation for library management systems and a preferred choice by most libraries..

One of the shifts in the landscapes is the trend towards hosted services or better known as cloud computing. The positive advantage in this shift is it frees libraries from worrying about the technical component of system administration. Furthermore, libraries are increasingly expecting web-based interfaces that eliminate the overhead of installable desktop clients that supports efficient and ergonomic workflow. The technology vendors will also be able to incur lower costs per library in providing enhanced revenue. In summary, librarians really need to work out the model license to adopt. There are no strict rule that stipulates that a library has to have one type, but a hybrid approach is recommended if the competency and cost evaluation matters most.

Open source software and Meeting the needs

Adopting OSS as part of the libraries' infrastructure is not an easy task. There are a number of competencies and skills set that a librarian need to observe or has in them. Al-Hawamdeh and Foo (2001) noted that these competencies are much more applicable and relevant today for most librarians. In order to identify further, where meeting the needs in understanding OSS, librarians should not only focus on the segment on tools and technology but they have to be everything that is mentioned and illustrated.

Furthermore, Foo and Ng (2008) also emphasized that these elements has to be introduced in library schools to equip future librarians with a certain level of knowledge awareness. Otherwise, future librarians will have to compete with students from the computer science or information technology domain. This can be observed now where a computer science graduate is able to build an online information service model that is as similar to that of a library's online information service model. With the introduction of social entrepreneurship, the competition is greater for the library science graduands.

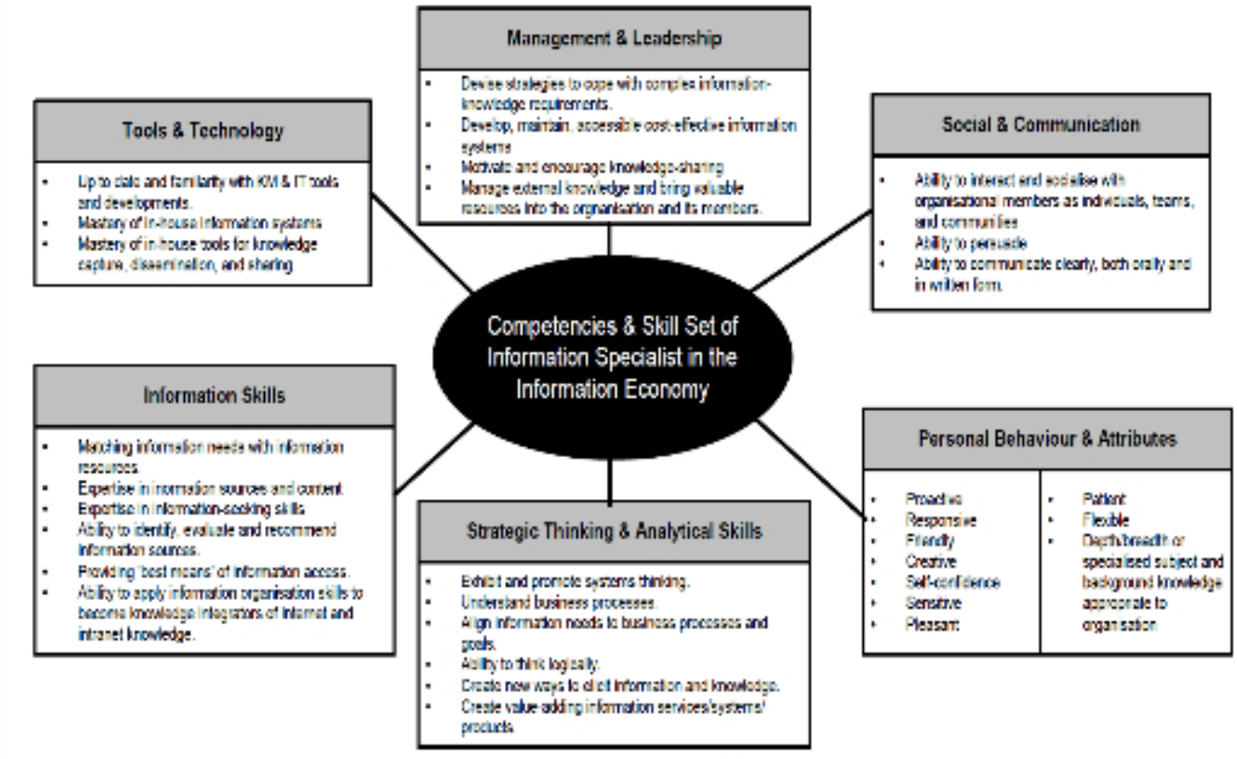

Figure 4: Competencies and skills set of information specialist in the information economy

Apart from this competencies and skills set, librarians also need to know about traditional system administration. Open source is not only about the software but is extended to the server achitecture and much more. In terms of cost evaluation, a number of hidden costs and knowledge has to be explored before one really decides to adopt open source. This is a challenge but it is not impossible to deliver and achieve. Many entreprenuers start to build their online information service from scratch using the methodology adopted from best practices in library and information science.

One example of this is the Doctrorate Support Group which started out with an initial interest of postgraduate students to share about scholarly communciation and the challenges they face as students. Topics such as finding scholarly materials, using scholarly tools to aid their research, getting in touch with each other, helping and advising are the main focus of the group. Today, the group has over 40,000 members across globally with most of them coming from Malaysia. The founding team members have expressed the need to buld a portal to host and facilitate this initiative with a resource library of research expert, learning materials and also alternative library material that harness on open access knowledge. It was a challenge for the founding team members until a trained librarian stepped forward to aid the initiative and bring it to another level. The portal is still in active construction as it begins its journey with mininal funding or backing. The portal can be accessed at htttp://dsgportal.org. This was developed and built using the knowledge approach (or framework) discussed in this paper. The best way to cope with technology is to use this approach but it is also possible to consider the proposed chain of learning paradigm or journey (Aharony, 2011; Aharony, 2008; Foo and Ng, 2008) as shown in Figure 5.

Awareness→ Knowledge → Experimentation → Immersion

Figure 5: Knowledge flow framework

The awareness of the application or software has to be in built into the librarian's domain knowledge. This is followed by using knowledge to look for required resources and then the experimenting with the application through trial and error. Once success is achieved or meet one's expectation, the software is deployed and the librarians bring it forward to the end users to gather their insights and feedback. It is a lengthy process, but the level of satisfaction is there.

Moving forward

The challenges in adopting OSS are high when compared to others. It might or might not be cost saving solution depending on the framework that has been adopted. This will open up a number of studies on the applications adopted in the online information services for library from different aspects. Moving forwards, the study or discussion should not stop here but has to evolve and give a better understanding on how coping with technology can be carried out via best practices by the librarians

Conclusion

There will still be a market for OSS for library applications. Either the librarians or the entrepreneurs will pick it up and integrate it as part of their online information service model to serve the community. Before embarking onto this journey, librarians need to be aware of the best practices that have been shared and discussed here. Generally, most librarians can be seen as trying to cope with technology, but there must have a firm based model for them to experience the journey. In this way, it not only will portray their expertise as librarians but they will also be characterised with the characteristics of entrepreneurs who are able to decide, recommend and implement certain valued added technology and services to align with the operation of the library's online information model.

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