

Progressive Trends in Electronic Resources Management (ERM) amongst Academic Libraries in Hong Kong

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Abstract

This paper aims at examining the major trends in electronic resource development to academic libraries in Hong Kong. Due to technology advancement, the habits of library patrons in using library materials have changed, in particular, due to the ubiquity of smart devices and mobile networks. Moreover, with the decreasing costs of digital access storage, related technologies and human labor requirement, digitization of electronic resources have been developed rapidly. As such, users' expectations have shifted in the past decade, particularly for research and scholarship, because digital records and electronic materials have become easier and convenient to access in a 24/7 environment. In this study, we investigate these changes of academic libraries in the format of resources (tangible or intangible), purchasing types (ownership versus access), and acquisitions options ("just-in-case" acquisitions or "just-in-time" acquisitions). We also examine issues accompanying these technological shifts, including library policies, copyright, budget, and consortial collaboration among academic libraries. This study identifies the drivers of evolution, influences, changes in academic libraries, common threats, and opportunities, along with the future role of academic libraries through an analysis of data collected from literature and interviews with practitioners.

Introduction

According to the Association of Research Libraries (2014), research collections are being reshaped by new kinds of content, formats, publishing models, and accessing arrangements. As library collections and services are increasingly moving towards digital, organisational procedures, workflows, budgets, mode of user education, format of reference services, as well as service delivery platforms must also evolve to meet with the ever-changing needs and growing expectations amongst library end-users. Identifying various issues and challenges currently faced by practicing library and information (LIS) professionals is undoubtedly the key in understanding the progressive trends of e-resources management (ERM) amongst libraries under the digital age.

Further, the drivers of the evolution is not just user expectations, but also other practical needs faced by the LIS professionals, such as electronic information resources, changes of communication technologies, the never-ending expanding contents of the digital resources themselves, etc. In particular, such electronic information resources include millions of webpages and databases produced by individuals, companies, institutions, and government agencies (Inouye *et al.*, 2001, Maceviciute, 2014). The formats and publishing models have also undergone dramatic changed in the past decades. Kenney (2012) showed that the electronic collection expenditures in Cornell University Library were doubled when compared to the previous year. With the aim of fulfilling user needs, the types of electronic collections provided by libraries also increased (Zhou et al, 2017), which included electronic books, electronic journals, electronic music resources, electronic newspaper, electronic database, electronic theses, etc. The ultimate competitive advantage lies in the nature and format of these digital resources, that is allowing convenient 24/7 user access to these library resources, fulfilling their information needs through instant gratification, while breaking free from any limitations posed by the printed collections or the physical library (Tenopir, 2013).

From the viewpoint of a library manager, going online, replacing the printed collections with their digital counterparts could also help reduce a great deal of costs, in terms of processing and space, which is unquestionably a great incentive for libraries. Despite of all the advantages mentioned above, ERM is not without its own challenges. According to Todd Carpenter (Managing Director of NISO¹), “rapid expansion of digital resources compounded with changing formats and sales models

¹ NISO – National Information Standards Organization

in the short life of Web-based delivery systems has particularly made the management process more complex...details relating to purchasing, licenses, access, and usage have been kept in ad hoc systems built by in-house teams or by the individual librarian needing to organise her workflow” (2007, p. 79).

Aims of the Study

As such, this study is intended to explore the common themes emerging from the current state, and particularly the progressive trends of ERM amongst selective professional librarians practicing at four different academic libraries in Hong Kong. The research questions guiding this study are as follows:

1. To identify various internal and external factors that are driving the evolution of the library collection management processes, that is transforming from print to digital;
2. To examine how this evolution of e-resources impacts in library services and operations, e.g., how academic librarians in Hong Kong are responding to such changes imposed, thereby identifying critical issues, problems, as well as good practices related to ERM.
3. To identify a new set of technical skills and professional/technological knowledge that academic librarians need to master, in order to succeed in ERM under this digital era.

Values and Significance of the Study

There have been relatively few studies on such relevant topic in East Asia. Studies based on qualitative interviews with LIS professionals practicing in Asia for data collection are equally rare. Particularly, no other comprehensive study has fully delved into this area in the context of ERM practices amongst academic libraries in Hong Kong. This study intends to fill the research gap by offering a glimpse into common themes and challenges emerging from ERM, from the perspective of a small group of academic librarians practicing in Hong Kong. We hope this study could bring new insights to the field. In this study, seasoned LIS practitioners were invited to share their valuable professional experiences as well as perceptions, and focus was given on explaining their choices, decisions, and identifying important factors that were influencing their decisions.

Literature Review

The literature on ERM developments and their impacts on the academic library are substantial and only growing. As a prevalent format in academic libraries, information creation speed, delivery, dissemination, user needs and expectations of e-resources have radically changed (Ross & Sennyey, 2008), and the factors of progressive trends of electronic resources development are critically linked to space and budget.

Technological changes

New digital technologies in the information age has resulted in the increase of e-resources at academic libraries (Inouye et al., 2001). This is because new teaching and research strategies are also adapted to such new information environment. It stimulates the production of huge volumes of electronic scholarly outputs, while substantial print books have their electronic versions. The amount of e-resources is expanding faster than libraries' ability to collect.

Changes in users' information needs and seeking behaviour

With developments in technology, library users can now easily search and browse for required information through desktop computers, smartphones, laptops, tablets, and e-readers (Dukic, Chiu, & Lo, 2015; Ko et al., 2015). Moreover, popular Internet resources like Google, Amazon, Netflix, and Kindle have all contributed to an expectation that information can be immediately accessed (Schoonover, Siriwardena & Jones, 2014). In this information age, patrons expect anytime, anywhere access to information at the point of need, flexible Web contents, and easy mobile access via wireless data networks and services, together with improved OPAC, online reference services, other discovery tools, Cloud-based services, etc. (Stanishevskaya, 2012).

As such, academic libraries would support new users' information needs in the current digital environment as well as offer quicker and more convenient access to materials. Librarians seek new ways to collect, organize, reallocate the library materials to meet the users' expectation and work with networked environments effectively, in order to face competition from other information providers (Ross & Sennyey, 2008).

Labour issues

However, the digital revolution brings with it threats and opportunities for the future development and the libraries. The library may need to arrange additional manpower and time to handle issues such as patrons' expectations, budgeting, licensing and copyright, awareness of collection, and collection evaluation. Prabhakaran & Mishra (2012) argues that while the technological revolution has caused work to be carried out more efficiently, many employees are uncomfortable with its implementation due to uncertainty with change.

The literature reveals that development of technology innovates a new type of collection for the library users who could remotely access the electronic materials 24/7 by their computers and mobile devices (Wang et al., 2016). Yet, when compared to every other library resources, e-resources are "easier and cheaper to maintain" (Adeyinka, 2011). The literature indicates some advantages in the purchasing of new collection formats. For example, preventing lost book problems, reducing costs for rent and manpower (i.e. circulating, patrolling, and weeding), saving shelf space, eliminating binding, storage, and stack maintenance costs are such advantages. By re-purposing library spaces, academic libraries can hold more programs and service activities while providing more technology and equipment for their users. It could attract more patrons to visit the library and use the new facilities so that the usage rate of library and its collection can increase (Inouye et al., 2001).

Facilitating collaboration

The literature indicates that there is great potential for the growth of library consortia to meet the rapid information needs of users. With limited budget and resources, libraries simply cannot not collect, deliver, and store all the materials comprehensively. Odlyzko (2013) argues that modern technology's low costs can result in a break with traditional subscription publishing models. It is thus beneficial for different libraries to work together in sharing information, maintaining, and managing costs, time, workload, and manpower in order to save costs, while the older editions of journals and hard to find edition of books would be provided comprehensively for patrons.

Moreover, the skills, knowledge, and experiences of staff on topics such as copyright, archive, standard, hardware and software, evaluation and negotiation skills could also be shared through collaboration in a consortia. With this new technology, the roles that libraries take on become more

mutable. For instance, many government libraries now partner with other researchers to publish digital collections in order to enhance the organizational ownership of its own resources. (Balnaves, 2013).

Limitations of electronic resources

Yet, there are challenges with e-resources, particularly when it comes to restrictions. For example, at the British Library, only limited portions of text can be copied and printed and some subscription databases are only available in the reading rooms. Moreover, the entire contents of journals and databases are protected by copyright of the publishers. Hence, such restrictions certainly can be a threat to library lending. If patrons are inconvenienced in accessing electronic collections, they may refuse to use the materials or login to the databases altogether. Database publishers are very concerned about their legal protections under copyright law and thus often integrate security features that restrict contract provisions. They may be unwilling to give open-ended rights to use their data (Harper, 2007).

Woodberry & Richardson (2015) point out that although site licenses for electronic materials have become the norm, libraries that opt to directly negotiate with vendors soon realize it is a consuming task with a limited success rate. **Moreover, e-resources are leased contents rather than in perpetual ownership. Thus, the growth of technology includes drawbacks for libraries that are often expected to provide usage of every library material in the catalogue (Adeyinka, 2011). However, there are some sources that librarians can use for advice on this matter. For example, the Liblicense Project provides resources, commentary, and discussion forums for assistance with crafting license agreements. Along with this, the International Coalition of Library Consortia (ICOLC) provides listserv and other support for negotiations with the vendors.** Because of this rapid technological development, the terms, conditions, and prohibitions would be increased and amended.

Organizing e-resources is a challenge as well, particularly as libraries are expected to catalogue its electronic collections and remove MARC records as vendors continually adjust their plans and withdraw titles from the aggregated collection. Moreover, it is difficult to maintain and archive such materials after expiration.

New librarian roles and initiatives

Peachey and Woodall (2005) assert that “all libraries have attempted to make the access to electronic services and resources as seamless as possible.” As librarians are expected to identify, acquire, process, arrange, and make information available, even their roles has been drastically redefined due to the methods of locating and retrieving information with the development of technologies and e-resources. Limb (2004) recalls a time when librarians were experts in online searching and in using databases. The instructional role of librarians in providing specialist research services has changed as librarians are now also expected to continually create and develop new services such as document delivery and interlibrary loan in the digital environment for academics and researchers. Woodberry & Richardson (2015) provides an example at Bond University Library where the library provides onsite hardware and software packages to convert print documents to electronic formats as well as transmitting the results to the requesting institution.

In summary, there are disparate studies on various issues regarding ERM, but few on a holistic view or trends of this subject, especially in the context of major academic hubs in the East like Hong Kong.

Research Methods

Choice of method

The choice of research method for the current study was influenced by the aims of this research. This exploratory study intends to reveal a different and richer type of data that a questionnaire survey cannot provide. Qualitative interviews were used for illustrating the underlying reasons for individuals' actions as well as their decisions. Hsieh and Shannon (2005, p. 1278) state, "It is a research method for the subjective interpretation of the content of text data through the systematic class state process of coding and identifying themes or patterns." Hsieh and Shannon (2005) illustrate that with the focus on integrated views of speech or texts and their special contexts, this type of analysis can enable researchers an understanding of social reality through a subjective yet scientific perspective. This method is suitable to research projects as it is to explore the meanings underlying the decision-making process amongst the interview participants. Therefore, the qualitative interview method is considered effective to examine the influences of progressive trends in electronic resource development to academic libraries.

In addition, direct, face-to-face interview is considered to be the most fruitful data-gathering technique for qualitative research (Leedy & Ormrod, 2013). One major advantage of using semi-structured interview questions is that it facilitates probing and ensured that crucial information is not omitted (Neuman, 2009). Furthermore, it enables expression of the participants' beliefs in their own words, and it brings out a variety of, sometimes contradictory, points of view. In addition to allowing the participants to articulate the answers based on their own understandings of the researchers' questions, such natural and free conversational interviews also enable maximum flexibility for more open, spontaneous, and instant exchanges of ideas without any preconceived expectations on the interviewers' side. According to Bryman (2001) and Weiss (1998), one of the strengths of qualitative interviewing is that it often allows for "unexpected" responses to emerge. Therefore, a qualitative approach was considered appropriate for the aims and setting of this study. In other words, qualitative analysis enables the researchers to look deeper into the issues being examined from multiple perspectives.

Data collection

Face-to-face interviews, each approximately 45 minutes, were the main data-gathering technique used for this study. Participation in this study was entirely voluntary. Each interview contained

approximately six main questions (see Appendix for details). The interviews were conducted in semi-structured format, and were fluid in nature. All participants in the interviews were asked the same set of open-ended questions, with the aim of maintaining level of consistency amongst the interview data. The aim was to possibly find common threads amongst the participants' answers. The questions dealt with participants' own experiences and perceptions in ERM, and most importantly with the different factors, which drove the changes in ERM practices, and how individual interviewees responded to such changes. Emails were written to the respective participants for seeking permission for participation in the interviews, explaining the purpose of the study, outlining the length of the interviews, and so on. Permission was also sought for voice recording of the interview sessions. Once the recorded interviews were then transcribed, and relevant information revealed by individual participants was arranged in common themes, and conclusions were then drawn accordingly.

Selection and recruitment

Four academic librarians, with different specialities, practicing at four different academic libraries in Hong Kong were invited to talk part in this qualitative study. Their areas of specialities included: Information (Reference) Services, Collection Management, Acquisitions, and Technical Services. All four participants wished to remain anonymous for this interview study, so that they could be as honest and unimpeachable as possible.

Technical limitations

With reference to the limitations of the research design, this study was based solely on qualitative interviews with merely four academic librarians practicing in Hong Kong. In other words, participants were chosen for pragmatic reasons, mainly, participants' willingness for participation. As Walden (2006) notes, participants must be willing to contribute and be comfortable discussing the topic in hand. Furthermore, the process of conducting qualitative interviews is always very labour intensive. Meanwhile, the process of qualitative data analysis of any sample size could be equally time-consuming and often considered impractical. Finally, the major limitation lies in the choice of the research methods, that is, although qualitative interviews allowed the researchers to examine the underlying issues for the individual participants' decision-making process, it could not provide further insights into the situation on a macroscopic scale. As a result, no attempt has been made to analyse the situations across the academic library community in Hong Kong as a whole.

Analysis of Interview Results

This section discusses the findings from the interviews in relation to the literature review. From this discussion, we highlight discoveries in response to the research questions. Furthermore, this section will also look at some of the lessons gained from this investigation for the wider study.

Digital versus printed: which offers more advantages?

In recent years, we have witnessed an overwhelming amount of e-resources and digitizing initiatives, as well as new ways of delivering scholarly materials via electronic means worldwide. With the aim of identifying the reasons behind this compelling digital phenomenon amongst academic libraries, the interviewees were asked: “*From the administrative and operational viewpoint, what are the main benefits of purchasing e-resources, in comparison to their printed counterpart?*” Table 1 summarizes the opinions collected.

<Insert Table 1 here>

Interview results revealed that digital contents undoubtedly facilitate convenient service provision anytime, anywhere. From the viewpoint of saving time and manpower, electronic resources can unquestionably save a great deal of manpower to handle the end-processing, circulation, shelving/re-shelving operations, as well as other technical processes. In addition, several interviewees also pointed out that e-resources could save a great deal of their staff time from compiling statistics manually, thereby eliminating errors caused by human input. Moreover, as space premium in Hong Kong is especially high, saving shelving space is also an important concern. Therefore, the HKUST Library “has about 43,000 titles of e-journals, and in contrast to only 500 titles of the printed counterpart,” while the HKU Library “does not subscribe to printed journals anymore.”

Impacts of e-resources on user access and expectations

With the aim of understanding the enduring challenge within the landscape of e-resources, and how LIS professionals should negotiate the future with user community that they serve, the interviewees were asked to describe the kind of impacts of e-resources are having the end-users’ modes of access and expectations. Table 2 summarizes the opinions collected.

<Insert Table 2 here>

Modern technologies have coughed out new methods (e.g., delivery platforms and searching mechanisms of meeting users' information needs. This includes new methods of scholarly communication, expansion of the library's virtual space through knowledge or research/information/learning commons, the spread of social media (e.g., Facebook, Instagram, Twitter, etc.)(Kong, Chiu, & Ho, 2016), and the explosive growth of various mobile devices, tablets and related applications (e.g., Wechat, LINE, Whatsapp, etc.), and they have completely revolutionised end-users' modes of access, information needs and expectations.

Digital resources and their inherent challenges

As Choi & Rasmussen (2009) note, digital library applications are closely associated with Web technology. As a result, modern academic libraries must make every attempt to make their e-resources and other digital collections more accessible via the Web. Despite of its obvious advantages mentioned in the previous section, going digital is not without any inherent challenges. In order to understand the kinds of impacts that digital resources have on ERM practices, the interviewees were asked, "*What are some of the biggest challenges and opportunities posed by digital resources?*" Table 3 summarizes the opinions collected.

<Insert Table 3 here>

Results of this interview study clearly revealed that despite of all the advantages mentioned in the previous section, high subscription costs, and budget constraints are the biggest challenge faced by all ERM professionals worldwide. HKUST librarian complaint that "If the library budget is not increased by say 5%, we would then have to cut spending in other areas in order to balance our expenditures." Though the advantage of e-journals are obvious over the print, HKUST Librarian further pointed out that "many users still prefer printed books, despite some users are open to both formats, and therefore libraries still have to continue to buy new books in both digital and printed in the foreseeable future."

ERM trend and general impact

As the shift from print to electronic means as mentioned above inevitably introduce much changes in workflow and probably increase in manpower requirement, the interviewees were asked about such changes. Next, in order to investigate the general impact for the academic library environment under the digital era, interviewees were asked, “*What would be the progressive trends in the developments of academic digital resources in the next five years, and how would the library community go about to tackle the inherent challenges?*” To follow up, we further ask how the local consortium of academic libraries could help. Table 4 summarizes the opinions collected.

<Insert Table 4 here>

Obviously, working with e-resources requires new sets of skills for librarians when compared to their printed counterparts. Tammaro (2007, p. 237) notes that cataloguing and classification of the web would need an understanding of the diversity of resources, solving problems of describing textually non-textual entities, subjectivist valuation of cultural heritage, the multiplicity of interpretation, and paradigmatic changes in related disciplines in order to create the efficient schemes that can organize such e-resources. Does Hong Kong have the requisite concerted efforts to help provide such skills for librarians? The Joint University Librarians Advisory Committee (JULAC) could be the answer as JULAC is a forum established to discuss, coordinate, and collaborate on library information resources and services among the libraries of institutions funded by the University Grants in Hong Kong. As one HKUST librarian opines: “Academic libraries in Hong Kong have had a long history of collaboration in terms of negotiation with content providers, and sharing cost and content.”

Discussion

This section focuses on the discussion of the interview results and the significance of these findings in a wider context. Moreover, these results are evaluated and analyzed according to main aims of the study. The interview results of this study are supportive to the findings reported in the Literature Review. Libraries' decisions in going digital is closely related to the direct and immediate benefits brought by nature and format of the digital resources. The main factors that are currently driving the evolution of the library collection from printed to digital are as follows.

1. Ease of accessibility – in addition to being available 24/7, users can visit the shared resources by any terminal equipment or even mobile devices (Ko et al., 2015) – thereby optimising the use of library resources to improve the teaching, learning, and research of the university community as a whole;
2. Meeting the end-users' rapidly changing information needs and expectations –fulfilling their instant gratification, while free from the constraints imposed by the printed resources; at the same time (Wang et al., 2016), enabling the end-users to filter information in multiple ways by using keywords and categories as facets in information discovery (Alemu & Stevens, 2015, p. 74).
3. E-resources could lead to significant savings in both manpower and hours that would otherwise be spent on manual cataloguing, tattle-taping, spine-labelling, as well as circulation services (i.e., including shelving/re-shelving).
4. With ever-growing collections and serious reluctance to increase physical facilities inside the library, unarguably, digital resources could vastly reduce the need for physical space.
5. Effort of going digital is in line with the overall developments and increasing popularity of mobile and wireless technologies that enable the library end-users to access the learning resources, generate contents, and create their own learning materials in at any location (Ko et al., 2015). In addition, digital resources allow students the unique opportunities to decide their own modes of learning (collaborative learning as well as individualized learning) for students.

The results collected from the interview revealed that librarians from different institutions have similar opinions towards the progressive trends of ERM amongst academic libraries, and they are: (1) budget issues pending on print will keep shrinking, (2) budget for electronic resources will keep growing, and (3) continue growth of collaboration amongst local academic libraries.

New skills and technological knowledge expected of LIS professionals

Like their international counterparts, results of this interview study reveal that the LIS professionals practicing in Hong Kong are also being challenged by new skill requirements due to changed technologies and workflows. The next generation of integrated library system will be designed with primarily e-collection in mind, with the aim of providing seamless delivery of library services and resources for meet the users' expectations while automating and streamlining workflows (Chiu et al., 1999). Meanwhile, the old generation of physical-collection-based automated library system, is out of sync with reality. These dramatic changes in operations, practices, and procedures have had a significant impact on the professional knowledge and technical skills requirements for LIS professionals in this technologically-driven environment. In other words, LIS professionals needs to re-conceptualize the traditional LIS skills through the use of new technology (Ho et al., 2016). For this reason, it is important that the new generation LIS professionals use this knowledge base to adapt current skills to respond to new 'problems' in an ever-changing work environment. The training of the next-generation LIS professionals (ERM managers in particular) needs to evolve to meet the challenges of these requirements of the digital age academic library (Raju, 2014).

To respond to such drastic changes, it is important for the LIS professionals (ERM managers in particular), to transform the old model of collection development and then adapt and develop new format of collections such as electronic resources and hypertext. The interview results also revealed that traditional in-depth cataloguing of e-resources is gradually being replaced with bulk cataloguing with less detailed and refined bibliographic records. Information research will become increasingly seamless and Google-like. To become a successful LIS professional under this new digital environment, one must master the following five main skills are (1) technological knowledge and training, (2) organizational and evaluation skills, (3) business management, and (4) interpersonal skills.

Business management and interpersonal skills

LIS, especially in the digital academic library environment, is becoming a profession that is driven by technology (Riley-Huff & Rholes, 2011, p. 129). The roles of LIS professionals and the nature of their work have changed in response to the new digital environment, and they have developed new applications and services. The interviewees of this study have reported on these changes as well as its inherent workflows. As a result, librarians need to learn different skills for handling all the library operations and processes on a technical level, alongside with management and communication skills, in a way similar to that of a business manager (Lo et al., 2016). In other words, they also need to equip themselves with business negotiation skills that are necessary for bargaining effectively with different publishers or e-resources vendors. ERM professionals are also expected to have knowledge of various copyrights issues and institutional subscription licensing in order to survive in the digital era. Moreover, the techniques of IT and searching skills should be improved due to growth of e-resources and information explosion. As pointed out by Nonthacumjane (2011, p. 286), “personal generic and discipline-specific skills” are required for LIS professionals to be more effective and efficient working in the digital era. Findings of this study are supportive of Raju’s (2014), that is the professional knowledge and technical skills for LIS professionals to effectively and efficiently practice in a digital-era academic library require a combination of discipline-specific knowledge, generic skills, and personal competences

In short, LIS professionals are expected to have a good understanding of the processes of how the end-users require and access information has changed over time (Zhou et al., 2017), in order to be able to guide users on e-resources access and use.

Conclusion

This paper is based on an analysis of the results from a series of face-to-face and email interviews, conducted with a selective group of academic librarians practicing in Hong Kong. Selected according to their different areas of speciality in LIS profession, the knowledge imparted by the interview participants shed valuable insight to the various ERM practices on an operational, and managerial level from multiple perspectives. Despite of its technical limitations, findings of this study are valuable to understanding the progressive trends of ERM amongst the academic community in Hong Kong and academic libraries in a broader context. These results are equally useful for other practicing LIS practitioners to learn about the various ERM-related issues, as well as to anticipate the

future trend that may affect users' behaviour, as well as future decisions of the ERM professionals in particular.

More information than ever before is born-digital. Furthermore, the news about users and their consumption patterns of information in this digital environment is also troubling (Coleman & Sumner, 2004). As pointed out by Jayasuriya and Brillantine (2007), librarians need to identify and understand students' information needs in order to design effective library services in this dynamic environment. Mobile devices, online social networking apps, and various communication technologies will continue to play an important role in how end-users connect to libraries and their resources. To respond to such new and drastic changes, flexibility, adaptability, and innovation are expected of today's LIS professionals (ERM managers in particular). As stated by Oshilalu (2011), librarians should "embrace the emergence of electronic library resources as a development that is capable of increasing their productivity rather than perceiving it as any form of threat." (p. 29)

References

- Adeyinka, O. H. (2011). Emergence of electronic library resources: A threat to librarians? *International Journal of Library and Information Science*, 3(2), pp. 29-33.
- American Psychological Association. (2014). Ethical principles of psychologists and code of conduct. *Introduction and Applicability*. Retrieved July 18, 2015, from <http://www.apa.org/ethics/code/index.aspx>.
- Alemu, Gataneh & Brett Stevens. (2015). *An Emergent Theory of Digital Library Metadata: Enrich then Filter*. Amsterdam: Chandos Publishing.
- Association of Research Libraries. (2014). *Research collections*. Retrieved July 20, 2015 from <http://www.arl.org/focus-areas/research-collections#.VIVDX9KUeSq>.
- Balnaves, E. (2013). *E-lending: threats and possibilities*. Retrieved July 15, 2015 from <http://blogs.ifla.org/it/2013/03/12/e-lending-threats-and-possibilities/>.
- Cappelli, D., Moore, A. P., & Shimeall, T. J. (2007). Protecting against insider threat. Retrieved July 15, 2015 from <http://www.sei.cmu.edu/library/abstracts/news-at-sei/securitymatters200702.cfm>.
- Carpenter, T. (2007). Electronic resources challenges and opportunities. *Standards Column*, pp. 79-81.
- Chiu, D. K.W., Li, Q., & Karlapalem, K. (1999). A meta modeling approach to workflow management systems supporting exception handling. *Information Systems*, 24(2), 159-184.
- Choi, Y. & Rasmussen, E. (2006). What is needed to educate future digital librarians: A study of current practice and staffing patterns in academic and research libraries. *D-Lib Magazine*, 12 (9). Available at: <http://www.dlib.org/dlib/september06/choi/09choi.html>
- Coleman, A & Sumner, T. (2004). Digital libraries and user needs: Negotiating the future. *Journal of Digital Information*, 5(3): 9-21.
- Dukic, Z., Chiu, D. K., & Lo, P. (2015). How useful are smartphones for learning? Perceptions and practices of Library and Information Science students from Hong Kong and Japan. *Library Hi Tech*, 33(4), 545-561.
- Harper, G. K. (2007). *Copyright in the library*. Retrieved July 22, 2015 from <http://copyright.lib.utexas.edu/1-ctrct.html>
- Harvard University. (2014). *Symposium on sustainable models for print storage in 21st-century libraries*. Retrieved July 22, 2015 from <http://library.harvard.edu/ssmps>.
- Ho, K. K., Lo, P., Chiu, D. K., San Kong, E. W., Chen, J. C. C., Zhou, Q., Yang, X., & Dalsgard, S. (2016). Intrinsic vs. extrinsic motivations of Master of Library and Information Science students: A cross-cultural comparative study. *Journal of Librarianship and Information Science*, in press.
- Hsieh, H. F. & Shannon, S. E. (2005). Three approaches to qualitative content analysis. *Qualitative Health Research*, 15(9), 1277-1288.
- Inouye, A., Hedstrom, M., Flecker, D., Levy, D., Fox, E. A. & Borgman, C. L. (2001). A digital strategy for the library of congress. *Digital libraries: proceedings of the 1st ACM/IEEE-CS joint conference, JCDL '01*, pp.178.

- Jayasuriya, K. P. & Brillantine, F. (2007). Student services in the 21st century: evolution and innovation in discovering student needs, teaching information literacy, and designing library 2.0-based services, *Legal Reference Services Quarterly*, 26(1-2), pp.135-170
- JULAC. (2015). *Welcome to JULAC*. Retrieved July 25, 2015 from <http://www.julac.org/>.
- Kaczorowski, T. (2013). *Patron driven acquisitions (PDA): an annotated bibliography*. Retrieved July 15, 2015 from http://ir.lawnet.fordham.edu/cgi/viewcontent.cgi?article=1000&context=staff_publications.
- Kenney, A. R. (2012). *Building a 21st century research library*. Retrieved July 25, 2015 from http://staffweb.library.cornell.edu/system/files/Myanmar_June2012_Kenney.pdf.
- Ko, E. H., Chiu, D. K., Lo, P., & Ho, K. K. (2015). Comparative study on m-learning usage among LIS students from Hong Kong, Japan and Taiwan. *The Journal of Academic Librarianship*, 41(5), 567-577.
- Kong, E. W., Chiu, D. K. W., & Ho, K. K. (2016). Applications of Social Media in Academic Library Services: A Case of the Hong Kong Polytechnic University Library. *International Journal of Systems and Service-Oriented Engineering (IJSSOE)*, 6(2), 53-65.
- Limb, P. (2004). *Digital dilemmas and solutions*. Oxford: Chandos Publishing.
- Lo, P., Chiu, D. K., Dukic, Z., Cho, A., & Liu, J. (2016) Motivations for choosing librarianship as a second career among students at the University of British Columbia and the University of Hong Kong. *Journal of Librarianship and Information Science*, in press.
- Maceviciute, E. (2014). Research libraries in a modern environment. *Journal of Documentation*, 70 (2): 282-302.
- Nonthacumjane, P. (2011). Key skills and competencies of a new generation of LIS professionals. *IFLA Journal*, 37 (4): 280-288.
- Odlyzko, A. (2013). *Open Access, library and publisher competition, and the evolution of general commerce*. Retrieved July 26, 2015 from <http://www.dtc.umn.edu/~odlyzko/doc/libpubcomp.pdf>.
- Oshilalu, H.A. (2011). Emergence of electronic library resources: a threat to librarians. *International Journal of Library and Information Science*, 3(2): 29-33.
- Peachey, L. & Woodall, L. B. (2005). *Evolution of the digital library: making access seamless*. Retrieved July 25, 2015 from <http://www.aee.com.au/conferences/papers/2005/Paper/Paper88.pdf>.
- Prabhakaran, A. and Mishra, H. K. (2012). *Technological change in libraries: the evolution of techno stress*. Retrieved July 23, 2015 from http://www.researchersworld.com/vol3/Paper_14.pdf.
- Powell, J. & Fox, E. A. (2005) Multilingual federated searching across heterogeneous collections. *D-Lib Magazine*, September. Retrieved July 15, 2015 from: <http://www.dlib.org/>.
- Raju, J. (2014). Knowledge and skills for the digital era academic library. *The Journal of Academic Librarianship*, 40(2): 163-170.

- Riley-Huff, D.A. & Rholes, J.M. (2011). Librarians and technology skill acquisition: Issues and perspectives. *Information Technology in Libraries*, 30(3): 129-140.
- Ross, L. & Sennyey, P. (2008). The library is dead, long live the library! The practice of academic librarianship and the digital revolution, *Journal of Academic Librarianship*, 34(2), p.145-152.
- Schell, C. (1992). *The value of case study as a research strategy*. Retrieved July 15, 2015 from <http://www.finance-mba.com/Case%20Method.pdf>.
- Schoonover, D., Siriwardena, M. & Jones, R. (2014). *Library express delivery service: the evolution of a campus delivery service at Florida State University*. Retrieved July 26, 2015 from http://diginole.lib.fsu.edu/cgi/viewcontent.cgi?article=1011&context=library_faculty_publications.
- Stanishevskaya, I. (2012). *Going Nano: mobile technologies and academic libraries*. Retrieved July 26, 2015 from <http://olacinc.org/drupal/conference/2012/Irina2012.pdf>.
- Tamaro, A.M. (2007). A curriculum for digital librarians: A reflection on the European debate. *New Library World*, 108: 229-246.
- Tenopir, C. (2013). *Use and Users of Electronic Library Resources: An Overview and Analysis of Recent Research Studies*. Washington, DC: Council on Library and Information Resources.
- Walters, W. H. (2012). Patron-driven acquisition and the educational mission of the academic library, *Library Resources and Technical Services*, 56(3), pp.199-213
- Wang, P., Chiu, D. K., Ho, K. K., & Lo, P. (2016). Why read it on your mobile device? Change in reading habit of electronic magazines for university students. *The Journal of Academic Librarianship*, 42(6), 664-669.
- Weiss, C. H. (1998). *Evaluation methods for studying programs and policies*. 2nd ed. Upper Saddle River, NJ: Prentice Hall.
- Woodberry, E. & Richardson, J. (2015). *From vision to reality: the evolution of a library model*. Retrieved July 15, 2015 from http://www98.griffith.edu.au/dspace/bitstream/handle/10072/68373/103551_1.pdf;jsessionid=EDB1A22488D0388DF63D89FCE56E106B?sequence=1.
- Yin, R. K. (1984). *Case study research: design and methods*. Newbury Park.: Sage Publications.
- Zhou, Q., Li, Z., Huang, X., & Chiu, D. K. (2017). Undergraduates' Electronic Resources Diffusion at the Peking University: An Exploration on Language Impacts. *Library Collections, Acquisitions, & Technical Services*, in press

Appendix

Interview Questions Semi-structured Oral/Email Interview

1. It is obvious that the amount of e-resources is increasing in every library. What would be the main and possible reasons?
2. What difficulties did you meet when purchasing the e-resources? (e.g., copyright problem, technology, time for negotiation with vendors, patrons' expectations, budgeting and collection evaluation, etc.)
3. There are many benefits of purchasing e-resources. May you give some examples other than the reasons of reducing cost and saving time cost?
4. What will your library compose the idea of the collection with other libraries / institutions forthcoming years? (e.g., collaboration) What are the obstacles that may be encountered as it evolves?
5. What would be the great changes for the trend of e-resources? Are there extra manpower and tasks for your work? (i.e., tangible/intangible ; ownership/access ; "just-in-case" acquisitions/"just-in-time" acquisitions ; "outside-in" model/"Inside-out" model)
6. What do you think about the future situation of progressive trends in electronic resource development?